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# PHARMACOLOGY: MENTAL HEALTH MEDICATIONS

## 6 CONTACT HOURS

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*By: Staff Writer*

**NOTE:** This course is a review and provides continuing education, but is not to be taken as prescriptive mandates.

Prescribers should always consult at least two references before acting because information about drugs can change rapidly.

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### Learning objectives

- Identify the classifications of drugs used to treat depression.
- Explain the action of each classification of antidepressant drug therapy.
- Describe the side effects of each classification of antidepressant drug therapy.
- Identify herbs used in the treatment of depression.
- Explain the potential reactions when using herbs for the treatment of depression.
- Explain nursing considerations for the client on antidepressant drug therapy.
- Identify the classifications of drugs used to treat anxiety.
- Describe the action of each classification of drugs used to treat anxiety.
- Identify the side effects of anti-anxiety drugs.
- Explain the potential reactions when using herbs for the treatment of anxiety.
- Explain nursing considerations for the client on anti-anxiety drugs.
- Discuss pharmacological interventions for alcoholism.
- Evaluate the various types of drugs used in the treatment of bipolar disorder.
- Explain the benefits and risks of drugs used in the treatment of bipolar disorder.
- Identify important considerations for nurses relating to the pharmacologic treatment of bipolar disorder.
- Describe the various drugs used in the treatment of schizophrenia.
- Identify the side effects of drugs used in the treatment of schizophrenia.
- Identify drugs used to control or lessen the side effects of drugs used in the treatment of schizophrenia.
- Discuss important nursing considerations for clients taking drugs used in the treatment of schizophrenia.

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### Introduction

Mental illness, defined as diagnosable mental disorders, causes more disability in developed countries than any other group of illnesses, including cancer and cardiac disease. In fact, it is estimated that 25 percent of all adults in the United States will develop at least one mental illness during their lifetime.<sup>1</sup>

The prevalence of mental illness makes it almost a certainty that nurses, no matter their practice setting or specialty, will care for persons who are currently experiencing a mental

illness. It also makes it likely that these persons are taking medications for such illnesses or will need to be prescribed appropriate pharmacotherapy. Therefore, it is imperative that all nurses be knowledgeable about the types of medications prescribed for various mental illnesses, their actions, dosage, side effects and potential adverse interactions. This education program will provide information about the pharmacological interventions for several of the most commonly encountered mental illnesses.

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### Antidepressant pharmacology

The reported incidence of depression has risen every year since early in the 20th century. In the United States, it is estimated that one in six people experience a depressive episode at some point in their lifetime. However, only half of the people who meet the criteria for diagnosis seek treatment for their depression.<sup>2</sup>

Depression is characterized by feelings of sadness, hopelessness, helpless, suicidal ideation, worthlessness, or guilt inappropriate

to the situation, tiredness, decreased enjoyment and interest in previously enjoyable activities, and difficulty concentrating.<sup>16</sup>

Prescription antidepressant medication is the most common treatment modality for depression. About 80 percent of clients who take antidepressants report an improvement in their symptoms.<sup>3</sup>

Treatment length varies among clients. Treatment for an initial depressive episode may last from six months to a year, and

recurrent episodes may require two years of treatment with antidepressants. Chronic depression may necessitate lifelong treatment.<sup>3</sup>

It may take from one to eight weeks for antidepressant medication to become effective, depending on the dosage and the client. Drugs are generally prescribed initially at a low dose, which is gradually increased according to the client's tolerance and response to the drug. Clients should be taught that therapeutic effects are not immediately apparent.<sup>3,4</sup>

**Drug alert!** Clients on antidepressant medication must be carefully monitored. In some cases, antidepressants may increase the risk for suicidal ideation, particularly in young adults and children.<sup>3,4</sup>

The Food and Drug Administration (FDA) mandates that all antidepressants carry a warning that some children, adolescents

and young adults may be at increased risk for suicidal ideation. All clients, however, should be monitored meticulously for any increase in depression or unusual behavior, particularly during the first few weeks after antidepressant therapy is initiated.<sup>4,5</sup>

Antidepressant medications include the following:<sup>3,4</sup>

- SSRIs: selective serotonin reuptake inhibitors.
- Tricyclic antidepressants (TCA) and tetracyclic antidepressants: referred to as cyclics.
- MAOIs: monoamine oxidase inhibitors.
- Atypical antidepressants: also referred to as non-SSRIs.
- SNRIs: Serotonin and norepinephrine reuptake inhibitors.

**Drug alert!** Antidepressants are sometimes prescribed to treat conditions other than depression, such as panic disorder, post-traumatic stress disorder (PTSD), anxiety disorders, obsessive-compulsive disorder, and premenstrual dysphoric disorder.<sup>4</sup>

## Age-related concerns

Antidepressant use in children and adolescents requires meticulous monitoring. However, many medications have not been studied or approved for use with children. Researchers are not sure how these medications affect a child's growing body. Physicians often will prescribe an FDA-approved medication on an "off-label" basis for children even though the medicine is not approved for the specific mental disorder or age. Young people may have different reactions and side effects than adults and are at somewhat greater risk for suicidal ideation when taking antidepressants.<sup>3,4</sup>

Because older people often have more medical problems than other groups, they tend to take more medications than younger people, including prescribed, over-the-counter and herbal medications. As a result, older people have a higher risk for experiencing adverse drug interactions, missing

doses or overdosing. Older people also tend to be more sensitive to medications. Even healthy older people react to medications differently than younger people because their bodies process it more slowly. Therefore, lower or less frequent doses may be needed.

Sometimes memory problems affect older people who take medications for mental disorders. An older adult may forget his or her regular dose and take too much or not enough. A good way to keep track of medicine is to use a seven-day pillbox, which can be bought at any pharmacy. At the beginning of each week, older adults and their caregivers fill the box so that it is easy to remember what medicine to take. Many pharmacies also have pillboxes with sections for medications that must be taken more than once a day.<sup>3,4</sup>

## Selective serotonin reuptake inhibitors (SSRIs)

The most commonly prescribed antidepressants, SSRIs are considered to be generally safe and cause fewer side effects than other classifications of antidepressants.<sup>5</sup> They work by blocking central nervous system (CNS) reabsorption (reuptake) of the neurotransmitter serotonin in the brain. Altering the balance of serotonin is believed to facilitate the brain's ability to send and receive various chemical "messages." This helps to alleviate depression. These drugs are referred to as selective because they primarily have an impact on serotonin, not on other types of neurotransmitters.<sup>3,4,5</sup>

The following SSRIs are used for the treatment of depression:<sup>4,5</sup>

- Citalopram (Celexa).
- Escitalopram (Lexapro).
- Fluoxetine (Prozac, Prozac Weekly, Sarafem).
- Paroxetine (Paxil, Paxil CR, Pexeva).
- Sertraline (Zoloft).
- Fluoxetine combined with the atypical antipsychotic olanzapine (Symbayax).

Some SSRIs are available in the extended-release or controlled release forms. These are usually designated with the letters XR or CR. Such drugs enable a controlled release of medication throughout the day or even for a week at a time with just a single dose.<sup>4,5</sup>

Side effects commonly associated with SSRIs include:<sup>3,4,5</sup>

- Fatigue.
- Headache.
- Tremor.
- Dizziness.
- Insomnia.
- Dry mouth.
- Nausea.
- Diarrhea.
- Agitation or restlessness.
- Reduced libido.
- Difficulty reaching orgasm.
- Erectile dysfunction.
- Rash.

- Diaphoresis.
- Weight gain.
- Drowsiness.

**Drug alert!** Sexual side effects are common in persons taking SSRIs. Over 50 percent of clients taking SSRIs report sexual side effects.<sup>5</sup>

Clients must be taught about side effects and when and how to report them.

In addition to the previously mentioned risk for increased suicidal ideation and identified common side effects, there are a number of safety concerns associated with SSRIs. These concerns require nursing intervention in the form of excellent client education. Clients must be aware of potential adverse effects and when and how to report them.

## Pregnancy

Some antidepressants may place the fetus at risk during pregnancy or the drugs may pass to the baby during breastfeeding. Paroxetine (Paxil) in particular seems to be linked to an increased risk of birth defects, including cardiac and respiratory problems.<sup>5</sup> Women of childbearing age should

be counseled about the risks of taking an antidepressant while pregnant. Women who are considering becoming pregnant should discuss depression treatment options before becoming pregnant.

## Drug interactions

There are a number of drugs that can cause harmful effects if taken in conjunction with antidepressants. That is why it is so important to explain to clients that they must inform their health care providers of all of the medications they take, including not only prescription drugs, but over-the-counter medications, herbal preparations, vitamins, minerals and even nutrition supplements and weight-loss products. Many clients assume that non-prescription medications and substances such as aspirin, herbal preparations and vitamins are not really medicines, so they do not bother to inform their health care providers that they are taking them. Clients need to be told that any or all of these substances may interact negatively with antidepressants.

Monoamine oxidase inhibitors (MAOIs), such as phenelzine (Nardil) and isocarboxazid (Marplan), are also used in the treatment of depression. However, they must not be used in conjunction with SSRIs, nor should SSRIs be used within 14 days of MAOI therapy.

Use of MAOIs in too-close conjunction with SSRIs can cause neuroleptic malignant syndrome. This syndrome can be fatal and is characterized by hyperthermia, rigidity and autonomic dysregulation.<sup>4,5,6</sup>

Aspirin products, other non-steroidal anti-inflammatory drugs (NSAIDs), Coumadin and other drugs that increase coagulation time may increase the risk of bleeding if taken in conjunction with SSRIs. Clients who take such drugs should be cautioned about this risk and monitored closely.<sup>4,5</sup> When possible, alternatives to these types of drugs should be investigated while the client is taking SSRIs.

Serotonin syndrome is also a serious adverse reaction to antidepressant therapy. It is most likely to occur when two medications that raise serotonin are used in combination. This includes the herbal supplement St. John's wort, sometimes used in the treatment of depression. Serotonin syndrome is characterized by confusion, hallucinations, restlessness, loss of coordination, vomiting, tachycardia, irregular heart rates, dilated pupils, fever, changes in blood pressure and unconsciousness.<sup>4,5</sup>

## Discontinuing the drug

Clients must be instructed to take SSRIs as prescribed. They must not miss several doses and must not discontinue using the drug abruptly. When discontinuing SSRIs, the dosage must be tapered gradually under the supervision of the prescriber. Abrupt discontinuation can cause withdrawal-like symptoms that include:<sup>4,5</sup>

- Nausea.
- Headache.
- Dizziness.
- Lethargy.
- Flu-like symptoms.

## Tricyclic antidepressants (TCAs) and tetracyclics

TCAs and tetracyclics are among the earliest identified antidepressants and are sometimes referred to as cyclics. Although effective, they have been replaced by antidepressants that cause fewer side effects. However, TCAs and tetracyclics may still be prescribed for clients who do not respond to other classifications of antidepressants.<sup>7</sup>

These drugs work by increasing the amount of norepinephrine, serotonin, or both in the CNS by blocking their reuptake by the presynaptic neurons.<sup>4</sup> These actions make more norepinephrine, serotonin, or both available in the brain, which, in turn, enhances the ability of brain cells to send and receive messages. They also affect other types of neurotransmitters, which can cause a number of side effects. Route of administration

varies, depending on the specific cyclic. Some are available in injectable formats as well as oral routes.<sup>4,7</sup>

Cyclics used in the treatment of depression include:<sup>3,4,7</sup>

- Amitriptyline (Elavil).
- Amoxapine (Asendin).
- Desipramine (Norpramin).
- Doxepin (Sinequan).
- Imipramine (Tofranil).
- Maprotiline (Ludiomil).
- Nortriptyline (Pamelor).
- Protriptyline (Vivactil).
- Trimipramine (Surmontil).

Side effects of cyclics can vary depending on the specific medication. Common side effects can include:<sup>4,7</sup>

- Photophobia.
- Dry mouth.

- Drowsiness.
- Blurred vision constipation.
- Urinary retention.
- Dizziness.
- Delayed orgasm.
- Decreased sex drive.
- Tachycardia.
- Confusion.
- Hypotension.
- Increased appetite and weight gain.
- Fatigue.
- Headache.
- Nausea.
- Seizures, especially with maprotiline (Ludiomil).

Clients must be taught about potential side effects and when and how to report them.

## Pregnancy

There are a number of safety concerns associated with TCAs and tetracyclics. As with SSRIs, some cyclics may harm the fetus and may pass to the baby during breast-feeding. Women

of childbearing age should be counseled about the risks to the unborn child and to the baby during breast-feeding prior to becoming pregnant.<sup>7</sup>

## Drug interactions

Adverse drug interactions are also problematic. Serotonin syndrome is a possibility as it is with SSRIs. There are specific types of drugs that, if taken in conjunction with cyclics, can cause specific, severe problems. These include:<sup>4,7</sup>

- **Barbiturates, alcohol and other CNS depressants:** Can significantly increase CNS depression and drowsiness.
- **St. John's wort, SAM-e, and yohimbe (herbal preparations):** Can cause serotonin syndrome and decrease drug levels.

- **Evening primrose:** Can cause additive effects and lower seizure threshold.
- **Cimetidine:** May increase drug levels.
- **Clonidine (Catapres):** May decrease the anti-hypertensive effect of Catapres and cause severe, life-threatening hypertension.
- **Quinolones (broad-spectrum antibiotics):** May increase the risk of life-threatening arrhythmias.

## Lab studies and concurrent health problems

Cyclics may alter blood glucose levels. Blood glucose levels should be monitored, especially if the client is diabetic. Liver function should also be monitored as well as white and red blood counts.<sup>4</sup>

Cyclics can also exacerbate certain chronic health problems. They are contraindicated in clients who have received an MAO inhibitor within the last 14 days or who are in the acute recovery phase following a myocardial infarction. They are to be used with caution in persons who have narrow-angle glaucoma, enlarged prostate, or a history of seizures, cardiac problems, thyroid problems, diabetes or impaired liver function.<sup>4,7</sup>

**Drug alert!** *There are some environmental factors that can have an impact on clients taking cyclics. Smoking may lower drug levels. Clients who smoke must be particularly monitored for lack of drug effectiveness. Additionally, exposure to the sun may increase photophobia. Clients should be advised to avoid excessive exposure to sunlight.*<sup>4</sup>

As with SSRIs, cyclics should never be abruptly discontinued. Such abrupt discontinuation can cause withdrawal symptoms including nausea, headache, dizziness, lethargy and flu-like symptoms.<sup>4,7</sup>

## Monoamine oxidase inhibitors (MAOIs)

MAOIs were the first type of antidepressant drug developed, and although effective, they, like TCAs, have been replaced by other types of antidepressants that are safer and cause fewer side effects.<sup>8</sup> One of the major concerns related to MAOIs is that they generally necessitate dietary restrictions. If these drugs are taken in conjunction with a diet high in tyramine-

containing foods, life-threatening hypertension may occur.<sup>4,8</sup> However, MAOIs may still be prescribed if the client does not respond to other types of antidepressants.

Monoamine oxidase is an enzyme that helps to remove the neurotransmitters serotonin, dopamine and norepinephrine from

the brain. MAOIs work by inhibiting this removal, making more of these neurotransmitters available in the brain and enhancing brain cell communication.

However, MAOIs also affect other neurotransmitters in the brain and in the digestive system, causing significant side effects.<sup>8</sup>

MAOIs used in the treatment of depression include:<sup>4,8</sup>

- Isocarboxazid (Marplan).
- Phenelzine (Nardil).
- Selegiline (Emsam, Zelapar).
- Tranylcypromine (Parnate).

**Drug alert!** *Selegiline (Emsam, Zelapar) is available as a transdermal patch. Administering the drug via the patch may cause fewer side effects compared with the oral form of the drug.*<sup>4,8</sup>

Side effects of MAOIs include:<sup>4,8</sup>

- Headache.
- Insomnia.
- Dizziness.
- Nausea.
- Arrhythmias.
- Low blood pressure.
- Diarrhea.
- Dry mouth.
- Changes in sense of taste.
- Nervousness.
- Muscle aches.
- Weight gain.
- Difficulty urinating.
- Paresthesia.
- Erectile dysfunction.
- Reduced sexual desire.
- Difficulty reaching orgasm.

## Pregnancy

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There are significant safety concerns associated with the use of MAOIs. As with other classifications of antidepressants, MAOIs may place a fetus at risk and may pass to the infant

during breast-feeding. Women of childbearing age should be counseled about the risks to the unborn child and to the baby during breast-feeding prior to becoming pregnant.<sup>4,8</sup>

## Drug and food interactions

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MAOIs should never be taken in conjunction with other types of antidepressants or with St. John's wort because of the risk of dangerously high levels of serotonin (serotonin syndrome). Ginseng in combination with MAOIs may cause headache, tremors or mania. Concurrent use should be avoided.<sup>4</sup>

Clients taking MAOIs must restrict foods that contain high levels of tyramine. Tyramine is an amino acid found naturally in the body and in certain foods and helps in the regulation of blood pressure. Interaction of tyramine and MAOIs can cause dangerous, even life-threatening hypertension.<sup>8</sup>

Tyramine is found in especially large amounts in aged foods or foods that contain significant amounts of yeast. Foods that have moderate to large amounts of tyramine include:<sup>9</sup>

- All tap beers.
- Bottled or canned beer, including nonalcoholic beer.
- Aged cheeses such as cheddar, brie and camembert.

- Aged, smoked, fermented and pickled meats such as pepperoni, salami and meat jerky.
- Banana peel.
- Breads or crackers that contain cheese.
- Soy products.
- Pickled herring.
- Smoked fish.
- Red and white wine.
- Yeast extracts.

Clients should be provided with a list of foods that are high in tyramine and that should be avoided. A dietary consult is recommended to help clients modify their diets to reduce their intake of tyramine.

**Drug alert!** *As with any antidepressant, MAOIs should never be discontinued abruptly.*

## Atypical antidepressants

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Atypical antidepressants are referred to as atypical because they do not fit into other classifications of antidepressants. Each is unique and works in different ways with different side effects and safety concerns. However, atypicals are believed to affect neurotransmitters including dopamine, serotonin and norepinephrine.<sup>10</sup>

**Drug alert!** *Drugs should not be stopped abruptly.*

Atypical antidepressants used in the treatment of depression include:<sup>10</sup>

- Bupropion (Wellbutrin, Wellbutrin SR, Wellbutrin XL).

- Mirtazapine (Remeron, Remeron SolTab).
- Nefazodone (Serzone).
- Trazodone (Oleptro).

## Bupropion (Wellbutrin, Wellbutrin SR, Wellbutrin XL)

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Bupropion's exact action is unknown, but it is thought to weakly inhibit norepinephrine, dopamine and serotonin reuptake. It does not inhibit MAO, but its noradrenergic or dopaminergic mechanisms may cause the drug's antidepressive effect.<sup>4</sup>

Bupropion is believed to be a good choice for clients who have low energy caused by depression, but it can exacerbate or cause anxiety for some people. It is not associated with sexual side effects or weight gain as often as other antidepressants.<sup>10</sup>

**Drug alert!** Bupropion is also prescribed as an aid to smoking cessation treatment.<sup>4</sup>

Side effects of bupropion include:<sup>4,10</sup>

- Confusion.
- Abnormal dreams.
- Insomnia.
- Headache.
- Tremor.
- Sedation.
- Agitation.
- Dizziness.
- Seizures.
- Tachycardia.
- Arrhythmias.
- Blurred vision.

- Sore throat.
- Rhinitis.
- Dry mouth.
- Constipation.
- Nausea.
- Vomiting.
- Fluctuations in weight.
- Excessive sweating.

Contraindications include:<sup>4</sup>

- Clients who have taken MAOIs within the previous 14 days.
- Clients with seizure disorders.
- Clients with history of eating disorders (increases the risk of seizures).

There are a number of potential adverse drug interactions with bupropion use. These include:<sup>4</sup>

- **Other antidepressants:** May lower seizure threshold.
- **Beta-blockers:** Levels of beta blockers may be increased and cause adverse reactions.
- **Nicotine replacement agents:** May cause hypertension.
- **Alcohol:** May alter seizure threshold.

**Drug alert!** Excessive sun exposure may increase the risk of photosensitivity.<sup>4</sup>

**Drug alert!** Bupropion is not approved for use in children.<sup>4</sup>

## Mirtazapine (Remeron, Remeron SolTab)

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Mirtazapine is believed to act by enhancing central noradrenergic and serotonergic activity. Like bupropion, mirtazapine may help to counter sexual side effects that are caused by other antidepressants. Since it often causes drowsiness, it is usually taken at bedtime.<sup>10</sup>

Side effects include:<sup>4,10</sup>

- Somnolence.
- Dizziness.
- Increased appetite.
- Weight gain.
- Increased cholesterol levels.
- Increase or decrease in blood pressure.

- Decreased white blood cell count.
- Weakness.

Drug interactions include:<sup>4</sup>

- If used with MAOIs, fatal reactions may occur. Avoid use within 14 days of MAOI therapy.
- CNS depressants, including alcohol, may cause additive CNS effects.

Mirtazapine should be used with caution in clients with cardiovascular disease, cerebrovascular disease, seizure disorders, hepatic or renal impairment or history of mania or hypomania.<sup>4</sup>

## Nefazodone (Serzone)

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Nefazodone is thought to work by affecting neurotransmitters to enhance communication between brain cells. It may help to decrease anxiety in addition to alleviating depression. It is likely to cause drowsiness but is less likely to cause sexual side effects than other types of antidepressants.<sup>10</sup>

Side effects include:<sup>10,11</sup>

- Orthostatic hypotension (Clients should be taught to change positions slowly, especially when they first start taking the drug).
- Dizziness.
- Headache.
- Dry mouth.

- Blurred vision.
- Confusion.
- Nausea.
- Sleepiness.
- Weakness.
- Flushing.
- Heartburn.
- Constipation.
- Pain, burning, numbness, or tingling in the hands or feet.

**Drug alert!** Nefazodone has been associated with liver failure in some clients. Clients who have compromised hepatic function should not take this drug.<sup>10</sup>

## Trazodone (Olepto)

Trazodone is a rather weak antidepressant thought to work by inhibiting the CNS neuronal uptake of serotonin. It is likely to cause sleepiness so is usually taken at bedtime. In addition to helping to alleviate depression, it can also help to reduce anxiety.<sup>10,11</sup>

Side effects include:<sup>4,10,11</sup>

- Drowsiness.
- Confusion.
- Dizziness.
- Orthostatic hypotension.
- Dry mouth.
- Headache.
- Nausea.
- Weakness.
- Blurred vision.
- Arrhythmias.
- Fatigue.
- Constipation.
- Diarrhea.

**Drug alert!** Trazodone has been linked to a rare condition called priapism. Priapism is a persistent, painful erection not associated with sexual arousal. Clients who have an erection that lasts longer than four hours should seek emergency medical treatment.<sup>10</sup>

There are a number of potentially dangerous drug interactions with trazodone. These include:<sup>4</sup>

- **Other antidepressants:** May increase the risk of serotonin syndrome.
- **Antihypertensives:** May increase the antihypertensive effect of trazodone.
- **Digoxin and phenytoin:** Trazodone may increase the levels of these drugs.
- **MAOIs:** Avoid concurrent use.
- **Warfarin:** May increase PT. Dosage may need to be adjusted.
- **Herbs:** Ginkgo biloba may increase sedation effects. St. John's wort may lead to serotonin syndrome.
- **Alcohol:** May increase CNS depression.

**Drug alert!** Trazodone may decrease hemoglobin level.<sup>4</sup>

## Serotonin and norepinephrine reuptake inhibitors (SNRIs)

SNRIs work by increasing brain concentrations of the neurotransmitters serotonin and norepinephrine. They are also used to treat other mental health issues such as anxiety.<sup>4,13</sup>

SNRIs used to treat depression include:<sup>4,13</sup>

- Duloxetine (Cymbalta).
- Venlafaxine (Effexor, Effexor XR).
- Desvenlafaxine (Pristiq).

Venlafaxine is available in an immediate-release form (requiring two or three doses daily) and in an extended-release form administered once a day.<sup>13</sup>

SNRI side effects include:<sup>4,13</sup>

- Nausea (especially with duloxetine).
- Dizziness.
- Fatigue.

- Headache.
- Insomnia.
- Constipation.
- Diaphoresis.
- Elevated blood pressure (with venlafaxine).
- Tachycardia.
- Decreased sexual desire.
- Blurred or double vision.
- Arrhythmias.
- Erectile dysfunction.
- Difficulty urinating.

Drug interactions include:<sup>4</sup>

- **MAOIs:** Avoid use within 14 days of each other.
- **Alcohol:** May cause liver damage if used in conjunction with some SNRIs.
- **SSRIs:** May lead to serotonin syndrome.

## Herbal medicines

A number of herbal medicines have been used in the treatment of depression. Clients should be cautioned that if they are consulting with herbal medicine practitioners, they MUST inform their other health care providers of any herbal supplements they are taking. Some clients believe that herbs are “natural” and therefore do not have adverse side effects or interactions with medicines. It is imperative that clients understand that herbs have the potential to cause dangerous, even fatal, side effects and interactions with other drugs as well as affect lab tests.

**Drug alert!** Herbs should only be prescribed by a practitioner who is well-versed and qualified in herbal medicine. All health care practitioners should ask their clients whether they are

taking any type of herbal supplement to avoid dangerous side effects or drug interactions.

A few of the herbal medicines used to treat depression are described below.

- **St. John's wort**  
St. John's wort is available in capsule, tablet, tincture, sublingual capsule and cream formats. It should not be used during pregnancy and lactation nor should it be given to children. Side effects include dizziness, insomnia, restlessness, fatigue, constipation, abdominal cramps, photosensitivity, rash and hypersensitivity.<sup>18,19</sup>

The following drug interactions are associated with St. John's wort:<sup>18,19</sup>

- **MAOIs:** May increase MAOI inhibition. Avoid concurrent use.
- **Antidepressants:** May increase risk for serotonin syndrome. Avoid concurrent use.
- **ACE inhibitors, loop diuretics and thiazide diuretics:** Concurrent use may lead to severe photosensitivity. Avoid concurrent use.
- **Alcohol:** May increase drug action. Avoid concurrent use.
- **Amphetamines:** May cause serotonin syndrome.
- **NSAIDs:** May lead to severe photosensitivity. Avoid concurrent use.

Persons taking St. John's wort should limit foods high in tyramine. These include aged cheeses, beer, smoked and pickled meats, and soy products.<sup>9,19</sup>

St. John's wort may cause increased growth hormone, decreased serum prolactin, serum iron and digoxin.<sup>19</sup>

- **Ginkgo**

Ginkgo is a tree native to China and Japan but is now also found in Europe and the United States. It is available in capsule, fluid extract, tablets and tincture form. It should not be used during pregnancy or lactation nor should it be given to children. It is also contraindicated in persons with coagulation or platelet disorders, hemophilia or seizures. Side effects include headache, anxiety, restlessness, nausea, vomiting, anorexia, diarrhea, flatulence and rash.<sup>9,19</sup>

The following drug interactions are associated with ginkgo:<sup>18,19</sup>

- **St. John's wort:** May cause hypomania if used in conjunction with ginkgo.
- **MAOIs:** MAOI action may be increased if taken with ginkgo. Avoid concurrent use.
- **Anticoagulants and platelet inhibitors:** May increase the risk of bleeding. Avoid concurrent use.
- **Anticonvulsants:** Ginkgo may decrease the effectiveness of anticonvulsants. Avoid concurrent use.

- **Buspirone and fluoxetine:** May cause hypomania if used concurrently.
- **Trazodone (Oleptro):** Concurrent use may cause coma. Ginkgo may increase bleeding time and decrease platelet activity, thereby leading to increase risk of bleeding.<sup>19</sup>
- **Khat**  
Khat is a tree found in Africa and on the Arabian Peninsula, and the raw leaves of the tree are used to make herbal medicine. It is ingested by eating the raw leaves followed by fluids.<sup>18,19</sup>

Khat should not be used during pregnancy and lactation nor should it be given to children. Its use is contraindicated in persons who have compromised renal, cardiac or hepatic systems.<sup>19</sup>

Side effects include tachycardia, arrhythmias, elevated blood pressure, pulmonary edema, circulatory collapse, restlessness, insomnia, headache, hallucinations, hyperthermia, diaphoresis, nausea, vomiting, anorexia, constipation, abdominal pain and spasms, cerebral hemorrhage, decreased sperm count and decreased libido.<sup>18,19</sup>

Khat may increase the action of the following drugs:<sup>18,19</sup>

- Amphetamines.
- Anti-arrhythmia agents.
- Antihistamines.
- Anti-hypertensives.
- Beta-blockers.
- Calcium channel blockers.
- Cardiac glycosides.
- Decongestants.
- MAOIs.

**Drug alert!** *The preceding paragraphs describe only a few of the many herbal preparations used in the treatment of depression. The importance of finding out whether the client is taking herbal preparations cannot be overemphasized.*

## Tamoxifen and antidepressants

Marjorie is a 55-year-old chemist recently diagnosed with Stage I breast cancer. Following a lumpectomy and radiation therapy, she has been prescribed a five-year course of tamoxifen. She is also dealing with symptoms of depression. Her health care provider determines that Marjorie would benefit from antidepressant therapy. But which antidepressant is appropriate for a woman who is also taking tamoxifen?

Tamoxifen is an adjuvant treatment for women with estrogen-positive breast cancer. Generally, tamoxifen is taken for five years after undergoing initial treatment (e.g. surgery, radiation, chemotherapy). In some cases, tamoxifen is used in an effort to prevent breast cancer in women who are at high risk for the development of breast cancer.<sup>4,12</sup>

Recent studies suggest that some antidepressants interfere with the effectiveness of tamoxifen by inhibiting the action of the enzyme CYP2D6. This enzyme is the primary enzyme that

converts tamoxifen into endoxifen, thus enabling the drug's effectiveness.<sup>12</sup> A review of the literature pertaining to the impact of various antidepressants on CYP2D6 indicated the following:<sup>12</sup>

- **Venlafaxine (Effexor):** has a minimal effect on CYP2D6 and is probably the safest choice if an antidepressant is needed while the client is taking tamoxifen.
- **Desvenlafaxine (Pristiq) and mirtazapine (Remeron):** Although direct studies on the impact of tamoxifen are not available, it is believed that the effect of these drugs on CYP2D6 should be minimal.
- **Citalopram (Celexa), escitalopram (Lexapro), and nefazodone (Serzone):** It is believed that these drugs have a mild inhibitory impact on CYP2D6.
- **Duloxetine (Cymbalta), sertraline (Zoloft), and fluvoxamine (Luvox):** It is believed that these drugs have a moderate inhibitory impact on CYP2D6.



- **Paroxetine (Paxil), fluoxetine (Prozac), bupropion (Wellbutrin):** It is believed that these drugs have a strong inhibitory impact on CYP2D6.

Although more research is needed to identify specific risk, there is growing evidence to suggest that some antidepressants

interfere with the effectiveness of tamoxifen. Clinicians should take this into account when prescribing antidepressants to women taking tamoxifen and avoid prescribing those antidepressants most liable to inhibit CYP2D6.<sup>12</sup>

## Anti-anxiety drugs

Jeffrey is a nurse practitioner in a family practice setting. He has a reputation of being a perfectionist. He describes himself as a “worrier.” In fact, Jeffrey does more than worry. He feels anxious almost all of the time, even when there is no obvious reason for anxiety. He is starting to have difficulty concentrating at work and focusing on his wife and children at home. After a serious discussion with his wife, Jeffrey decides to seek help from his health care provider for treatment of anxiety.

Everyone feels anxious at times. Anxiety is usually a normal reaction to threatening, dangerous or otherwise challenging situations. However, persons dealing with an anxiety disorder experience excessive, chronic anxiety that interferes with normal functioning. These people feel anxious even when no overt external stress exists. This type of anxiety is generally referred to as generalized anxiety disorder (GAD).<sup>14</sup>

It is believed that anxiety disorders occur as a result of hyperactivity in certain areas of the brain. This is thought to be related to low levels of the neurotransmitter gamma-aminobutyric acid (GABA), which helps to regulate nerve cell activity. Family history of anxiety disorders also increases the risk of development.<sup>14</sup>

More than 6 million people suffer from GAD in the United States. The disorder affects women (60 percent) more often than men (40 percent). Since descriptions and perceptions of anxiety vary among cultures, it is difficult to calculate an exact incidence worldwide.<sup>15</sup>

Several drug classifications are used in the treatment of anxiety disorders. These include antidepressants, benzodiazepines, beta-blockers, and the drug buspirone (BuSpar), an anxiolytic.

## Antidepressants

A number of antidepressants have been used to treat anxiety disorders. These include:<sup>4,16</sup>

- Fluoxetine (Prozac): SSRI antidepressant.
- Fluvoxamine (Luvox): SSRI antidepressant.
- Imipramine (Tofranil): Tricyclic antidepressant.
- Paroxetine (Paxil): SSRI antidepressant.

- Sertraline (Zoloft): SSRI antidepressant.
- Venlafaxine (Effexor): SSNRI antidepressant.

**Drug alert!** For detailed information on SSRI and SSNRI antidepressants, see the portion of this program that deals with antidepressant pharmacology.

## Benzodiazepines

Benzodiazepines are believed to work by increasing the effectiveness of the neurotransmitter GABA. Clients respond by experiencing a reduction in feelings of anxiety and stress and an improvement in ability to function and concentrate.<sup>17</sup>

Benzodiazepines prescribed for anxiety include:<sup>4,16,17</sup>

- **Alprazolam (Xanax):** Pregnancy category D (positive evidence of human fetal risk). Most common side effects are insomnia, irritability, dizziness, headache, anxiety, confusion, drowsiness, light-headedness, sedation, somnolence, impaired coordination, memory problems, fatigue, depression, diarrhea, dry mouth, constipation and risk of suicide. Contraindicated in clients with acute angle-closure glaucoma. Should be used with caution in clients with compromised renal, pulmonary and hepatic systems or persons with a history of substance abuse. Avoid concurrent use with kava, St. John’s wort, and grapefruit juice. Concurrent use with tricyclic antidepressants may increase levels of these drugs.
- **Chlordiazepoxide (Librium):** Pregnancy category D (positive evidence of human fetal risk). Most common side effects are drowsiness, lethargy and agranulocytosis. It

should be used with caution in elderly clients and in clients with depression, history of substance abuse or hepatic or renal disease. Should not be used in conjunction with the herb kava. Concurrent use of cimetidine may increase the risk of adverse reactions. CNS depressants, including alcohol, may increase depression and should be used with caution. Chlordiazepoxide may increase digoxin levels and the risk of digoxin toxicity, so clients should be closely monitored. Chlordiazepoxide may increase liver function test results and decrease granulocyte count. The drug may also cause a false-positive pregnancy test.

- **Clonazepam (Klonopin):** Pregnancy category D (positive evidence of human fetal risk). Most common side effects are drowsiness, ataxia and behavioral disturbances. This drug is contraindicated in clients with acute angle-closure glaucoma or significant hepatic disease. Clonazepam should be used with caution in children, clients with chronic respiratory disease, open-angle glaucoma or a history of substance abuse. It should also be used with caution in elderly clients. Clonazepam should not be used concurrently with CNS depressants (including alcohol) or phenytoin. Concurrent use with St. John’s wort may cause a decrease in

the drug's effects. Clonazepam may increase liver function test results and eosinophil count. It may decrease platelet and white blood cell count.

- **Diazepam (Valium):** Pregnancy category D (positive evidence of human fetal risk). Most common side effects are drowsiness, bradycardia and respiratory depression. Diazepam is contraindicated in clients with acute-angle glaucoma and should be used with caution in clients with compromised liver or renal systems, depression, history of substance abuse, or chronic open-angle glaucoma. It must be used with caution in elderly or debilitated clients. CNS depressants may increase CNS depression. Diazepam may increase digoxin level and the risk of digoxin toxicity. If used in conjunction with phenobarbital, the effects of both drugs may be increased. The herb kava may increase sedative effects and should not be used in conjunction with diazepam. Diazepam may increase liver function test results and decrease neutrophil count.
- **Lorazepam (Ativan):** Pregnancy category D (positive evidence of human fetal risk). Most common side effects

are drowsiness and sedation. Should not be used in conjunction with CNS depressants, including alcohol. May increase digoxin level and digoxin toxicity; smoking may decrease lorazepam's effectiveness. The herb kava may increase sedation if taken in conjunction with lorazepam. Use with caution in clients with pulmonary, hepatic or renal problems or history of substance abuse. Use with caution in elderly or acutely ill clients. There is a potential for abuse and addiction with the use of lorazepam.

- **Oxazepam (Serax, Oxpam):** Pregnancy category D (positive evidence of human fetal risk). Most common side effects are drowsiness, lethargy and dizziness. Oxazepam should be used with caution in elder clients, those with a history of substance abuse, and those who may experience cardiac problems if they experience a decrease in blood pressure. CNS depressants, including alcohol, may increase CNS depression. If taken with digoxin, digoxin levels may be increased. The herb kava may increase sedative effects. Oxazepam may increase liver function test results.

**Drug alert!** Benzodiazepines should not be discontinued abruptly.

## Beta-blockers

Beta-blockers, normally used to treat cardiac conditions, may be used to control physical symptoms of anxiety, such as trembling and diaphoresis. Taking beta-blockers for a short period of time can help keep uncomfortable symptoms under control.<sup>20</sup>

The beta blockers propranolol (Inderal) and clonidine (Catapres) have been used to treat the physical symptoms of anxiety.<sup>16,20</sup>

## Clonidine

Clonidine is thought to work by stimulating alpha2 receptors and inhibiting central vasomotor centers. This decreases sympathetic outflow to the heart, kidneys and peripheral vasculature. Peripheral vascular resistance is lowered as is blood pressure and heart rate.<sup>4</sup>

Clonidine must be used with caution in clients with cerebrovascular disease, chronic renal failure, compromised liver function and in clients with severe coronary insufficiency, recent myocardial infarction and conduction disturbances.<sup>4</sup>

The drug's most common side effects include drowsiness, dizziness, sedation, weakness, constipation, dry mouth and pruritis. Its pregnancy category risk is C (animal studies show adverse effects on the fetus, but adequate studies have not been conducted on humans). Clonidine may also cause bradycardia and severe rebound hypertension.<sup>4</sup>

Beta-blockers may increase CNS depression if used in conjunction with CNS depression drugs. Drugs with anti-hypertensive properties may increase hypotensive effects. Use in conjunction with digoxin and verapamil may cause AV block and severe hypotension. The herbs capsicum and ma huang may reduce the effectiveness of anti-hypertensives.<sup>4</sup>

**Drug alert!** Beta-blockers can cause life-threatening side effects. Clients taking these types of drugs must be closely monitored.<sup>4</sup>

Clonidine may decrease urinary excretion of vanillylmandelic acid and catecholamines. It may also cause Coombs' test results to be weakly positive.<sup>4</sup>

## Propranolol (Inderal)

Propranolol works by reducing cardiac oxygen demand. It inhibits renin secretion and prevents vasodilation of cerebral arteries. The drug's pregnancy category risk is C (animal studies show adverse effects on the fetus, but adequate studies have not been conducted on humans).<sup>4</sup>

Propranolol is contraindicated with bronchial asthma, sinus bradycardia, greater than first-degree heart block, heart failure and cardiogenic shock. The drug may necessitate dosage alterations of insulin and other anti-diabetic drugs. Phenothiazines may increase the risk of serious adverse reactions in these drugs as well as propranolol. Alcohol may increase propranolol levels and should not be used when taking this drug. The herb betel palm should not be used in conjunction with propranolol.<sup>4</sup>

Propranolol can affect some lab test results. It may decrease granulocyte count and T3 level. It may increase T4, BUN, transaminase, potassium, LDH and alkaline phosphatase levels.<sup>4</sup>

## Buspirone (BuSpar)

Buspirone is a non-benzodiazepine anxiolytic that is used in the treatment of anxiety disorders.<sup>16,20</sup> It is believed to work by inhibiting neuron firing and reducing serotonin turnover.<sup>4</sup> There are several important points about the administration of buspirone. These include:<sup>4,17</sup>

- Do not give with grapefruit juice.
- Teach the client to take the drug in a consistent manner, meaning at the same times each day and always with or without food. In other words, if the client takes the drug with food, he or she should always take it with food.
- Warn client not to stop taking the drug abruptly. It must be stopped under the guidance of the client's health care provider.
- Explain to clients that effects of the drug may not be apparent for several weeks.

Buspirone has a pregnancy risk category of B, meaning that animal studies have not shown a risk to the fetus, but controlled studies have not been conducted in pregnant women. Or animal studies have shown an adverse effect on the fetus, but adequate studies in pregnant women have not shown a risk to the fetus. This risk category is in contrast to many other drugs used in the treatment of anxiety that have a risk category of C or D.<sup>4</sup>

## Herbal medicines

Some herbalists have identified herbal medicines as treatment for multiple diseases and health problems, including anxiety. It is critical that clients inform their health care providers of any herbal medications that they are taking or thinking of taking.

### • Chamomile

Chamomile is found in Europe as a perennial plant. It is available in capsule, tea, fluid extract, cream and lotion formats. The dried flowers of the plant are used to make the various forms of chamomile. In addition to anxiety, it is commonly used to treat digestive problems, and in topical formats, to promote wound healing. Research is under way to assess the effectiveness of chamomile as an antioxidant.<sup>18,19</sup>

There are various types of chamomile. Roman chamomile has been shown to promote abortion of the fetus and therefore should not be used during pregnancy and lactation, but may be used in children. German chamomile has opposite effects.<sup>19</sup>

Adverse effects include nausea, vomiting, and with topical forms, burning of the face, eyes and mucous membranes.<sup>18,19</sup>

The use of chamomile with alcohol and other CNS depressants may increase sedative effects. These drugs should not be used concurrently with chamomile. There is some evidence that chamomile may interfere with the actions of anticoagulants. Concurrent use should be avoided.<sup>18,19</sup>

Common side effects of buspirone include:<sup>4,17</sup>

- Dizziness.
- Drowsiness.
- Nervousness.
- Nausea.
- Fatigue.

**Drug alert!** *Although buspirone is less likely to have sedative effects than other anxiolytics, clients should still be monitored for CNS reactions. Such reactions are unpredictable, and it should not be assumed that such reactions will not take place.*<sup>4</sup>

There are a number of potential interactions with buspirone. These include:<sup>4,17</sup>

- **Axole antifungals:** May cause adverse effects. Clients must be closely monitored.
- **CNS depressants including alcohol:** May increase CNS depressive effects. Avoid concurrent use or use with great caution.
- **MAOIs:** may cause an elevation in blood pressure. Avoid concurrent use.

### • Kava

Kava is a shrub that is found on the South Sea islands. In addition to anxiety, kava is used as an antidepressant, antipsychotic and antiepileptic, as well as to treat insomnia, restlessness and attention deficit-hyperactivity.<sup>18,19</sup> Research is being conducted to assess kava for its use as an anti-cancer agent.<sup>19</sup>

Kava is available in capsule, soft gel, beverage, extract, tablet and tincture forms. The dried roots of the shrub are used to make the herbal preparation. Explain to clients that kava absorption is increased if taken with food.<sup>18,19</sup>

**Drug alert!** *Clients should be taught to store kava products in a cool, dry place. They should also be instructed not to use kava for more than three months unless under the direction of an herbalist and in conjunction with their health care providers. Kava may be habit forming.*<sup>19</sup>

Kava should not be used during pregnancy or lactation, nor should children younger than 12 years old use it. It is also contraindicated in persons with diagnosed major depressive disorder or Parkinson's disease.<sup>19</sup> Kava may also be associated with hepatic disease; therefore persons with hepatic disease should not use kava.<sup>18</sup>

Side effects associated with kava include:<sup>18,19</sup>

- Headache.
- Sedation.

- Increased reflexes.
- Blurred vision.
- Nausea and vomiting.
- Anorexia.
- Weight loss.
- Hematuria.
- Decreased platelets and lymphocytes.
- Shortness of breath.

Drug interactions associated with kava include:<sup>18,19</sup>

- **CNS depressants, including alcohol:** May cause increased sedation when used with kava. Concurrent use should be avoided.
- **Anti-Parkinson's drugs such as levodopa:** Interactions can increase parkinsonism symptoms. These drugs should not be taken concurrently with kava.
- **Antipsychotics:** Can cause neuroleptic movement disorders.
- **Benzodiazepines:** Increase the possibility of increasing sedative effects. Avoid concurrent use.

Kava may increase liver function tests.<sup>19</sup>

- **Lavender**

Lavender is a flowering shrub. Its flowers are used to make oils, tinctures, lotions and tea. Lavender is used orally, topically or by inhalation for its antidepressant, anti-anxiety and calming effects. It should be stored in a cool, dry place, protected from heat and moisture.<sup>18,19</sup>

Until more conclusive research is available, lavender should not be used during pregnancy and lactation or given to children.<sup>19</sup>

Side effects associated with lavender include headache, dizziness, drowsiness, nausea, vomiting, constipation and increased appetite.<sup>18,19</sup>

Lavender may interact with CS depressants such as alcohol, sedatives and antihistamines by increasing their sedative effects. Concurrent use should be avoided. The absorption of iron salts may be decreased by lavender. Separate their use by at least two hours.<sup>18,19</sup>

Lavender has been shown to reduce cholesterol test levels.<sup>19</sup>

- **Lemon balm**

Lemon balm is a perennial found in Europe, Asia and North America. It has been used to treat gastric problems as well as depression and nervous disorders, such as anxiety. The dried leaves, fresh leaves and whole plant are used to make dry and fluid extracts, creams and powder. Lemon balm should be stored in a sealed container protected from heat and moisture.<sup>18,19</sup>

Until more conclusive research findings are available, lemon balm should not be used during pregnancy and lactation nor should it be given to children.<sup>19</sup> It should be used with caution in men with BPH, clients with thyroid disorders, and persons who are allergic to lemon or citrus-scented perfumes.<sup>18</sup>

Side effects associated with the use of lemon balm include nausea and anorexia.<sup>19</sup>

Lemon balm may interact with barbiturates by increasing sedative effects. It may also increase the effects of CNS depressants.<sup>18,19</sup> Lemon balm may interfere with the effectiveness of thyroid replacement therapy. Therefore, concurrent use is contraindicated.<sup>18</sup> Lemon balm tea may interfere with the absorption of iron salts. Use should be separated by at least two hours.<sup>19</sup>

Lemon may interact with herbs such as catnip, chamomile, kava and valerium by increasing sedative effects.

Concurrent use is discouraged.<sup>18</sup>

- **Mugwort**

Mugwort is a perennial found in North America. Its leaves and roots are used to make tinctures and teas. The roots are the parts of the plants that are used in the treatment of mental health problems such as depression and anxiety. Research is being conducted to evaluate whether mugwort has antibacterial and antifungal attributes.<sup>19</sup>

Mugwort stimulates the uterus, so should not be used by pregnant women. Nor should it be used by children or by women who are breast-feeding. Mugwort is also contraindicated in persons who have bleeding disorders.<sup>19</sup>

Persons who are sensitive to members of the Asteraceae (Compositae) family such as ragweed, daisies, sage and marigolds, or who are allergic to tobacco, honey or royal jelly may have allergic reactions to mugwort.<sup>18</sup>

Side effects associated with mugwort include nausea, vomiting, anorexia and hypersensitivity reactions, such as contact dermatitis. Severe allergic reactions such as anaphylactic shock can occur.<sup>18,19</sup>

Mugwort may increase sedative effects if taken in conjunction with CNS depressants, including alcohol. If mugwort is taken in conjunction with anticoagulants such as warfarin and heparin, there is an increased risk of bleeding. Mugwort should not be used with anticoagulants.<sup>18,19</sup>

Mugwort may cause an increase in direct bilirubin levels.<sup>19</sup>

- **Passion flower**

Passion flower is a perennial found in the tropics of the Americas. Its flowers and fruit are used to make liquid and solid extracts, tinctures and dried herbs.<sup>18,19</sup> Research is being conducted to identify possible use of passion flower as a treatment for the symptoms of Parkinson's disease.<sup>19</sup>

Women who are pregnant or lactating and children should not use passion flower.<sup>19</sup>

Excessive amounts of this herb may cause sedation. It may also cause headache, agitation, hypotension, tachycardia, nausea, vomiting, asthma, ventricular arrhythmias and hepatic toxicity.<sup>18,19</sup>

Passion flower may interact with CNS depressants, including alcohol, causing increased sedation. It may increase MAOI activity, and concurrent use with MAOIs should be avoided. Passion flower may also increase the action of anticoagulants, and concurrent use is contraindicated.<sup>18,19</sup> Passion flower may alter Pt and INR results.<sup>18</sup>

- **Valerian**

Valerian is a perennial cultivated throughout the world. Its roots are used as the medicinal parts of the plants. Valerian products should be kept away from heat and moisture. In addition to treating anxiety and mood disorders Valerian is used to treat insomnia, restlessness and symptoms of psychological stress. It is available in capsule, crude herb, extract, tablets, tea and tincture form.<sup>18,19</sup>

Women who are pregnant or lactating should not use Valerian, nor should it be given to children. It is contraindicated in persons with hepatic disease.<sup>19</sup>

**Drug alert!** *Liver function studies should be monitored, particularly if clients are taking the drug as part of long-term treatment. If results of these studies are elevated, valerian should be discontinued.*<sup>19</sup>

Side effects associated with Valerian include restlessness, decreased mental alertness, uneasiness, headache,

insomnia, nausea, vomiting, anorexia, vision changes and palpitations.<sup>18,19</sup>

Potential drug interactions with valerian include:

- **CNS depressants including alcohol:** May increase sedative effects. Clients should be closely monitored.<sup>18,19</sup>
- **MAOIs:** Valerian may negate desired therapeutic effects. They should not be used concurrently.<sup>19</sup>
- **Phenytoin:** Valerian may negate the desired therapeutic effects of phenytoin. They should not be used concurrently.<sup>19</sup>
- **Warfarin:** Valerian may negate the therapeutic effects of warfarin. They should not be used concurrently.<sup>19</sup>
- **Herbs with sedative effects (e.g., catnip, hops, kava, passion flower):** Sedative effects may be increased. Clients should be closely monitored.<sup>18</sup>

Valerian may cause an increase in ALT, AST, total bilirubin and urine bilirubin.<sup>19</sup>

## Medications used in the treatment of alcoholism

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Alcohol, a central nervous system depressant, is swiftly absorbed into the bloodstream.<sup>16</sup> Alcohol dependence and alcohol abuse can severely impact the lives of the persons affected, their families, employers and society. Alcohol withdrawal can be life-threatening, and detoxification needs to be conducted under medical supervision.<sup>16</sup>

Alcoholism is a chronic, progressive and possibly fatal disease. It is characterized by frequent, excessive drinking, inability to reduce or stop drinking even in the presence of medical, psychological or social complications, increased alcohol tolerance, and occurrence of withdrawal symptoms (tremors, sweating, tachycardia, hypertension, vomiting, hallucinations).<sup>21</sup>

Other health problems, including mental health issues, often exist in conjunction with alcoholism and other substance-abuse problems. In fact, research shows that persons dealing with alcoholism are nearly twice as likely as those without alcoholism to suffer from depression.<sup>22</sup>

Alcoholism and other substance-abuse disorders are a serious national health problem in the United States. It is estimated that more than 15 million Americans are dependent on alcohol, and 500,000 of them are between the ages of 9 and 12 years of age. There are about 5,000 alcohol-related deaths every year associated with the consumption of alcohol by young persons under the age of 21. These fatalities are due to motor-vehicle accidents, homicide, suicide and other injuries. One person is killed every 30 minutes in an alcohol-related traffic accident in the United States.<sup>16</sup>

The financial costs associated with alcoholism are staggering. It is estimated that alcoholism is the cause of 500 million lost days of work, 40 percent of industrial fatalities, and 47 percent of workplace injuries.<sup>16</sup>

There are many psychosocial interventions for persons with alcoholism, including counseling and support groups such as Alcoholics Anonymous. There are also some specific pharmacologic interventions with which the nurse must be familiar.

## Pharmacologic interventions

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Pharmacologic treatment in alcoholism has two main goals: permit safe withdrawal from alcohol and to prevent relapse.<sup>16</sup>

### Vitamin B1 (thiamine)

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Vitamin B1 (thiamine) is prescribed to prevent or to treat Wernicke-Korsakoff syndrome. This syndrome is a disorder of the brain caused by a lack of thiamine, common in persons with alcoholism. It is characterized by confusion, ataxia, tremors, double vision, nystagmus, loss of memory and hallucinations.<sup>23</sup>

**Drug alert!** *Folic acid and vitamin B<sup>12</sup> (cyanocobalamin) are also often prescribed for deficiencies of nutrition, which are often seen in persons with alcoholism.*<sup>16</sup>

## Medications to manage symptoms of alcohol withdrawal

Alcohol withdrawal is usually managed with a benzodiazepine anxiolytic drug. The purpose of administering such a medication is to control or suppress the symptoms of alcohol abstinence.<sup>16</sup> The most commonly used benzodiazepines are:<sup>16</sup>

- Lorazepam (Ativan).
- Chlordiazepoxide (Librium).
- Diazepam (Valium).

Detailed information about the preceding benzodiazepines can be found in the previous section on anti-anxiety medications. These medications can be administered around the clock on a fixed schedule or on an as-needed basis. Giving them on an as-needed basis has been found to be just as effective as administering them on a fixed schedule and seems to promote a more rapid withdrawal from alcohol as well.<sup>16</sup>

Several drugs may be prescribed to help prevent clients from drinking and to reduce cravings for alcohol. Disulfiram (Antabuse) is prescribed to help dissuade persons from drinking. It is available in tablet format. Clients take the drug (an average of 250 mg. P.O. daily) until permanent self-control is achieved. Treatment with disulfiram may continue for months or years, depending on the individual.<sup>4</sup> If someone who is taking disulfiram drinks alcohol, he or she experiences severe adverse effects, including flushing, throbbing headache, sweating, nausea and vomiting. In severe instances, confusion, extreme hypotension and even death may occur.<sup>16</sup>

**Drug alert!** *Clients taking disulfiram must be told to avoid products that contain alcohol, such as mouthwash, cough syrup, perfume, aftershave, vinegar, vanilla and other extracts. Teach clients to read labels very carefully, because any product that contains alcohol can cause symptoms.*<sup>16</sup>

Disulfiram should never be administered until the client has abstained from alcohol for at least 12 hours. He or she must be clearly informed about the effects of the drug and give permission for its use. Effectiveness of this treatment depends on the cooperation of the client.<sup>4</sup>

While taking disulfiram, clients may experience drowsiness, fatigue, depression, neuritis, psychotic reactions, delirium, optic neuritis, metallic or garlic aftertaste, impotence and acne.<sup>4</sup>

There are a number of drugs that can interact with disulfiram. These include:<sup>4</sup>

- **CNS depressants and barbiturates:** May prolong effects of these drugs. Use with caution.
- **Anticoagulants:** May increase anticoagulant effect, thus dose of anticoagulant may need adjustment.
- **Isoniazid:** May cause ataxia or significant behavioral changes. Avoid concurrent use.
- **Metronidazole:** May cause psychotic reaction. Avoid concurrent use.
- **Phenytoin:** May increase toxic effect of phenytoin. Phenytoin levels must be carefully monitored and dose adjusted as needed.
- **Tricyclic antidepressants:** May cause transient delirium.
- **Herbal preparations containing alcohol:** Such herbs must not be used while taking disulfiram.

- **Caffeine:** may increase elimination half-life of caffeine.

**Drug alert!** *Ingestion of alcohol can cause adverse reactions for one to two weeks after the last dose of disulfiram.*<sup>16</sup>

Disulfiram may increase cholesterol levels.<sup>4</sup> It is contraindicated during pregnancy and in persons with psychoses or cardiac disease, in persons taking alcohol-containing products, and in those who are experiencing alcohol intoxication or who have ingested alcohol in the previous 12 hours.<sup>4</sup>

Two drugs that may be prescribed to suppress cravings for alcohol are naltrexone (ReVia) and acamprosate (Campral). Naltrexone is an opioid antagonist frequently used to treat opioid overdose. It is also used to decrease cravings for alcohol.<sup>16</sup> It is available in oral and I.M. formats.<sup>4</sup>

Common side effects of naltrexone include insomnia, anxiety, nervousness, headache, nausea, vomiting, abdominal pain, muscle and joint pain, and injection site reaction.<sup>4</sup>

If administered with thioridazine, naltrexone may increase lethargy. If given with opioid-containing products, the effectiveness of the opioid may be decreased. Concurrent use should be avoided.

Naltrexone may increase the following lab test results:<sup>4</sup>

- Lymphocyte count.
- AST.
- ALT.
- LDH.

Acamprosate may be prescribed to help clients recovering from alcohol abuse or dependence to help decrease alcohol cravings and relieve emotional discomfort. The drug is contraindicated in persons with renal impairment.<sup>16</sup> It should be used with caution in pregnant or lactating women, elderly clients and those with a history of depression and suicidal thoughts or attempts.<sup>4</sup>

Side effects associated with acamprosate include diarrhea, nausea, flatulence and pruritis.<sup>16</sup> There are no known significant interactions with acamprosate. The drug may decrease platelet count, hemoglobin level and hematocrit. It may increase ALT, AST, bilirubin, blood glucose and uric acid levels.<sup>4</sup>

**Drug alert!** *Clients should be instructed to swallow tablets whole, not to crush, break or chew them.*<sup>4</sup>

Herbs used in the treatment of alcoholism

Found in China and Japan, kudzu is a vine that has been used in traditional Chinese medicine to manage alcoholism. This herb is also believed to have hypoglycemic effects. The medicinal parts of the vine are the routes, which are used to prepare capsules, tablets, powder and extract.<sup>18,19</sup>

Kudzu is contraindicated in the following persons:<sup>18</sup>

- Pregnant women.
- Lactating women.
- Persons with clotting disorders.
- Persons with cardiovascular disease.

- Persons with diabetes.
- Clients who take anticoagulants, aspirin, anti-diabetic agents, estrogen, hormonal contraceptives and tamoxifen.

Common side effects associated with the use of kudzu include nausea, vomiting, anorexia and hypersensitivity reactions.<sup>19</sup>

There are a number of potential drug interactions with kudzu. These include:<sup>18</sup>

- Tamoxifen: May interfere with tamoxifen's action. Avoid concurrent use.
- Estrogen and hormonal contraceptives: Kudzu may decrease effectiveness of these types of contraceptives. Concurrent use should be avoided or else the client should use a non-hormonal form of contraception.

## Alfalfa

Alfalfa grows throughout the world and is available as capsules, flour, tablets, sprouts, poultice, infusion and fluid extract forms. The medicinal parts of the plants are its flowers, germinating seeds, leaves and whole herbs.<sup>18,19</sup> Its primary benefit for those dealing with alcoholism seem to be its use as a nutritive tonic. Alfalfa is a good source of beta-carotene, calcium, iron, phosphorus, potassium and vitamins A, C, E and K.<sup>18,19</sup>

Research is under way to determine whether alfalfa can protect the gastrointestinal tract from cancer, reduce cholesterol levels, prevent symptoms related to menopause, and treat atherosclerosis.<sup>19</sup>

Alfalfa acts as a uterine stimulant and should not be used during pregnancy. It is also contraindicated in persons who have lupus erythematosus. It is also thought to be a good source of vitamin K.<sup>19</sup>

**Drug alert!** *The seeds of alfalfa must not be eaten. They contain a toxic amino acid.*<sup>19</sup>

Side effects associated with the use of alfalfa include hypotension, photosensitivity, systemic lupus erythematosus, bleeding and blood dyscrasias, diarrhea, digestive upsets and photosensitivity.<sup>18,19</sup>

## Pharmacologic interventions for bipolar disorder

Mark is the manager of an exclusive restaurant in a major metropolitan area. His staff complains that he has "moods." One employee describes him as "he's sad and quiet for a couple months, and then all of a sudden is excited and happy and working more than 12 hours a day. He expects us to work those hours and screams and yells if we don't. We never know what to expect. Sometimes he talks really weird. He says he's going to take over all the best restaurants in the city and that everyone will know who he is. I think I'll quit just to get away from him!" Mark is displaying the major mood swings of someone who may suffer from bipolar disorder.

Bipolar disorder (formerly known as manic-depressive disorder) is a mood disorder characterized by alternating

- Anti-diabetic drugs: Because kudzu has hypoglycemic properties, concurrent use may enhance those effects. Concurrent use should be avoided.
- Cardiovascular drugs: May interfere with cardiovascular drug effectiveness. Should not be used together.

The following herbs may cause additive effects: alfalfa, black cohosh, licorice, red clover, soy and flaxseed.<sup>18</sup>

Kudzu may also affect some lab studies. It may decrease glucose and cholesterol levels, and increase clotting time, PT and INR.<sup>18</sup>

**Drug alert!** *Remember to impress upon clients the necessity of discussing any desire to take herbal supplements with their health care providers before starting any herbal therapy.*

The following drug interactions are associated with use of alfalfa:<sup>18,19</sup>

- **Anticoagulants:** Alfalfa may interfere with coagulation and increase prothrombin time and prolong bleeding time. Concurrent use is not recommended.
- **Anti-diabetics:** Alfalfa should be used cautiously in conjunction with medications for diabetes. The herb may potentiate hypoglycemic effects.
- **Chlorpormazine:** Alfalfa may increase drug-induced photosensitivity. They should not be used concurrently.
- **Hormonal contraceptives:** Large amounts of alfalfa may interfere with contraceptive action. Concurrent use should be avoided.
- **Estrogen replacement therapy:** Alfalfa may interfere with hormone replacement therapy.
- **Herbs with clotting potential such as nettle, parsley and plantain:** Excessive use of vitamin K-containing herbs may increase the risk of clotting in persons who are taking anticoagulants. These herbs should not be used concurrently.
- **Vitamin E:** Absorption may be inhibited. Avoid concurrent use.

Alfalfa may reduce cholesterol and glucose levels.<sup>18</sup>

episodes of mania and major depression. During manic phases, clients are euphoric, excited and have poor judgment, feelings of grandeur, rapid thoughts, actions and speech.<sup>24</sup>

The depressed phase is characterized by feelings of sadness, hopelessness, helpless, suicidal ideation, worthlessness or guilt inappropriate to the situation, tiredness, decreased enjoyment and interest in previously enjoyable activities, and difficulty concentrating.<sup>16</sup>

Bipolar disorder is one of the most prevalent mental health disorders, second only to major depression as a cause of worldwide disability.<sup>16</sup> Bipolar disorder, according to the National Institute of Mental Health, affects more than 5 million

to 7 million adults in the United States annually. That means about 3 percent of the people in this country are affected.<sup>24</sup> Bipolar disorder occurs about equally among men and women and is more common in highly educated people.<sup>16</sup>

The mood swings of bipolar disorder vary in length and how often they occur. Some persons with bipolar disorder suffer primarily from major depression with occasional manic episodes. Others, however, experience “rapid cycling” with “at least four episodes of depression, mania or hypomania (less severe form of mania) occurring within one year.” There are also people who have what is referred to as “mixed” states, during which mania and depression take place simultaneously or in quite rapid sequence.<sup>25</sup>

There are two types of bipolar disorder:<sup>25</sup>

- **Bipolar type I:** The most severe form of the disorder, bipolar type 1 can cause significant problems with activities of daily living and interpersonal relationships. This form is characterized by manic or mixed episodes that last at least seven days. Symptoms may be so severe that hospitalization may be required. Manic or mixed

episodes are followed by episodes of major depression. Depression can last weeks or even years. Fortunately, clients may experience long periods of time between episodes when they are free from symptoms.<sup>25</sup>

- **Bipolar type II:** This form is characterized by alternating hypomanic episodes that last at least four days with periods of depression but no manic or mixed episodes. Hypomanic episodes have less severe symptoms than the manic episodes of type 1, but the depressive episodes may be quite severe.<sup>25</sup>

There is no cure for bipolar disorder. Treatment requires a life-long course of medications. “This is the only psychiatric disorder in which medications can prevent acute cycles of bipolar behavior.” Medications used to treat the disorder include lithium, an anti-manic agent, or anticonvulsant drugs used as mood stabilizers.<sup>16</sup>

It was once believed that lithium and the anticonvulsants only helped to moderate manic behavior, but now it is thought that these medications also help to protect clients from the impact of bipolar depressive cycles.<sup>16</sup>

## Lithium

Lithium was the first mood stabilizer approved (in the 1970s) by the Food and Drug Administration (FDA) for the treatment of mania. It has been shown to be effective in not only controlling manic symptoms but in helping to prevent recurrence of manic and depressive episodes.<sup>26</sup>

Lithium is believed to act by competing for salt receptor sites and affects calcium, potassium and magnesium ions and glucose metabolism. Its site of action is thought to be the synapses, where it speeds up the destruction of catecholamines such as dopamine and norepinephrine, inhibits neurotransmitter release, and decreases the sensitivity of postsynaptic receptors.<sup>16</sup>

Research shows that lithium is helpful in about 75 percent of persons with bipolar disorder. The remaining 25 percent either do not respond therapeutically or have problems with lithium because of its side effects, drug interactions or adhering to the prescribed treatment regimen.<sup>16</sup>

Lithium is not recommended for use in pregnant women because it can cause first-trimester developmental abnormalities. It also crosses the blood-brain barrier and placenta and is found in sweat and breast milk.<sup>16</sup>

Lithium should be used with caution in the following clients:<sup>4</sup>

- Persons receiving neuromuscular blockers.
- Persons receiving diuretics.
- Elderly or debilitated clients.
- Clients with cardiovascular, renal or thyroid disease.
- Clients with seizure disorders.
- Clients with sodium depletion or dehydration.

Side effects of lithium include fatigue, lethargy, arrhythmias, bradycardia, vomiting, anorexia, diarrhea, thirst, polyuria, renal toxicity (with long-term use), leukocytosis and muscle weakness.<sup>4</sup>

There are a number of potential drug interactions associated with lithium. Some of these include:<sup>4</sup>

- **ACE inhibitors:** These may increase lithium levels.
- **Aminophylline, sodium bicarbonate, urine alkalinizers:** May increase lithium excretion.
- **Anti-arrhythmic drugs:** Have the potential to increase the occurrence of life-threatening arrhythmias. Avoid concurrent use.
- **Calcium channel blockers:** May decrease lithium levels while increasing the risk of neurotoxicity. They should be used together with caution and careful monitoring.
- **Thiazide diuretics:** May increase the reabsorption of lithium causing toxic effects. If used concurrently, monitor lithium and electrolyte levels.
- **Caffeine:** May decrease lithium level.

**Drug alert!** People with bipolar disorder are often found to have thyroid problems. Lithium may cause low thyroid levels. Such low levels (hypothyroidism) have been linked with rapid cycling in some bipolar disorder clients, especially women.<sup>26</sup>

Lithium may increase the following lab test results:<sup>4</sup>

- Glucose.
- Creatinine.
- TSH levels.
- I uptake.
- White blood cell counts.
- Neutrophil counts.

Lithium may decrease sodium, T3, T4, and protein-bound iodine levels.<sup>4</sup>

Clients taking lithium should be told to take the medication with lots of water and after meals to reduce the possibility of gastrointestinal upset. They should also be informed that they should expect nausea, to void large amounts of urine, and to



experience thirst during the first few days of therapy. Warn clients to watch for signs of toxicity (see side effects) and to

withhold one dose and call a health care provider if such signs appear, but never to abruptly stop taking the drug.<sup>4</sup>

## Anticonvulsants

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A number of anticonvulsants have been found to help stabilize the moods of bipolar disorder clients. They are classified as miscellaneous anticonvulsants. Although it is not definitively known how these anticonvulsants work to stabilize moods, it

may be that they increase the brain's threshold for dealing with stimulation, thus stopping the client from being overwhelmed with external and internal stimuli.<sup>16</sup>

## Valproic acid (Depakote)

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Valproic acid (also known as divalproex sodium or sodium valproate) was approved by the FDA in 1995 for treating mania. It is an alternative to lithium as a bipolar disorder treatment and is usually as effective.<sup>26</sup>

Valproic acid is contraindicated in pregnant women and in those who may become pregnant. It can cause teratogenic effects, such as neural tube defects.<sup>4</sup>

Valproic acid may increase testosterone levels in teenage girls, causing polycystic ovary syndrome (PCOS) in women who begin taking the drug before they are 20 years of age. PCOS causes a woman's eggs to develop into cysts that collect in the ovaries instead of being released during monthly menstruation. In turn, this can lead to obesity, excess body hair and disruptions in the normal menstrual cycle.<sup>26</sup>

Valproic acid may cause the following additional side effects:<sup>4</sup>

- Dizziness.
- Headache.
- Insomnia.
- Nervousness.
- Somnolence.
- Tremor.
- Blurred vision.
- Diplopia.
- Abdominal pain.
- Anorexia.

- Diarrhea.
- Dyspepsia.
- Nausea.
- Vomiting.
- Liver toxicity.
- Bone marrow suppression.
- Alopecia.

Valproic acid may increase ammonia, ALT, AST and bilirubin levels. It may also increase eosinophil counts and bleeding time. The medication may decrease platelet, RBC and WBC counts. Valproic acid may cause false-positive results for urine ketone levels.<sup>4</sup>

The following drug interactions are possible:<sup>4</sup>

- **Aspirin, cimetidine, erythromycin:** May cause valproic acid toxicity.
- **CNS depressants:** May cause excessive CNS depression. Avoid concurrent use.
- **Phenobarbital:** Phenobarbital levels may increase and clearance of valproic acid may decrease.
- **Phenytoin:** May decrease valproic acid level and increase or decrease phenytoin level.
- **Rifampin:** May decrease valproic acid level.
- **Alcohol:** May cause excessive CNS depression. Avoid concurrent use.

**Drug alert!** Give drug with food to reduce gastrointestinal upset.<sup>16</sup>

## Carbamazepine (Tegretol)

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This drug was the first anticonvulsant found to have the ability to stabilize moods. However, the side effect of agranulocytosis was a concern.<sup>16</sup> It should not be used by pregnant women and is contraindicated in clients using tricyclic antidepressants, those who have taken an MAO inhibitor within the previous 14 days, and in persons with a history of bone marrow suppression.<sup>4</sup>

Side effects include dizziness, hypotension, ataxia, sedation, blurred vision, leucopenia, nausea, vomiting, hepatitis, arrhythmias and rashes.<sup>16</sup>

Some of the potential drug interactions with carbamazepine include:<sup>4</sup>

- **MAOIs:** May increase depressant and anticholinergic effects. Avoid concurrent use.
- **Phenobarbital, phenytoin, primidone:** May decrease carbamazepine level.

- **Cimetidine:** May increase carbamazepine level.
- **Nefazodone:** May increase carbamazepine levels and toxicity and decrease nefazodone levels. Avoid concurrent use.
- **Herbal preparations such as plantains (psyllium seed):** May interfere with the gastrointestinal absorption of the drug. Avoid concurrent use.

## Gabapentin (Neurontin)

Gabapentin, another anticonvulsant sometimes prescribed as a mood stabilizer) should be used with caution in elderly clients. It has a pregnancy category risk of C (Animal studies show adverse effects on the fetus, but adequate studies have not been conducted on humans).<sup>4</sup>

**Drug alert!** *Adjust dosage in elderly clients based on creatinine clearance values due to the possibility of decreased renal function.*<sup>4</sup>

Adverse reactions include dizziness, ataxia, hypotension, sedation, fatigue, somnolence, leucopenia, problems with coordination, nystagmus, nausea and vomiting.<sup>4,16</sup>

There are relatively few drug interactions related to gabapentin. These include:<sup>4</sup>

- **Antacids:** May cause a decrease in absorption of gabapentin. Antacids and gabapentin should not be given within two hours of each other.
- **Hydrocodone:** May increase gabapentin level and decrease hydrocodone. Monitor drug levels and adjust dosage as needed.

**Drug alert!** *Give drug with food to reduce gastrointestinal upset.*<sup>16</sup>

Be aware that valproic acid may decrease white blood cell count and cause false positive results with the Ames-N-Multistix Sg dipstick test for urine protein when used in conjunction with other antiepileptics.<sup>4</sup>

**Drug alert!** *The oral solution form of the drug should be refrigerated.*<sup>4</sup>

## Topiramate (Topamax)

This anticonvulsant drug is also prescribed on occasion as a mood stabilizer.<sup>16</sup> It should be used with caution in pregnant women, those who are breast-feeding, and in clients with impaired hepatic function.<sup>4</sup>

Topiramate can cause dizziness, anxiety, dizziness, ataxia, confusion, memory problems, fatigue, somnolence, paresthesia, psychomotor slowing, tremor, abnormal vision, nystagmus, anorexia, nausea, decrease or increase in weight, slurred speech, weakness, vomiting, and blurred or double vision.<sup>4,16</sup>

**Drug alert!** *With this drug and other drugs that have similar side effects, clients must be assessed for ability to ambulate safely and maintain coordination.*

**Drug alert!** *Give topiramate with food to reduce gastrointestinal upset.*<sup>16</sup>

Beware of the following potential drug interactions with topiramate:<sup>4,26</sup>

- **CNS depressants including alcohol:** May cause increased CNS depression. Avoid alcohol. Use CNS depressants only with caution.
- **Hormonal contraceptives:** The effectiveness of such contraceptives may be decreased. Clients should be advised to use alternate methods of contraception while taking topiramate.
- **Phenytoin:** Interactions may decrease topiramate level and increase phenytoin levels. Levels of both drugs must be carefully monitored if used concurrently.
- **Valproic acid:** May decrease both valproic acid and topiramate levels. Monitor levels closely.
- **Carbamazepine:** May decrease topiramate level. Careful monitoring is needed.
- **Carbonic anhydrase inhibitors:** May decrease topiramate level. Avoid concurrent use.

Topiramate can affect several lab test results. The drug can increase liver enzyme levels and decrease bicarbonate and hemoglobin levels and hematocrit as well as white blood cell count.<sup>4</sup>

## Antidepressant use in bipolar disorder

Sarah is a social worker who has recently relocated from a large metropolitan area to a rural community. She was diagnosed with bipolar disorder three years ago and has responded well to treatment with lithium. Shortly after relocating, Sarah begins to suffer the symptoms of a depressive episode. She is “tired of taking lithium” and decides to visit one of the two doctors in her new home, a tiny rural town. Unfortunately, Sarah decides not to tell the doctor about her bipolar disorder and only tells him about her depression, attributing it to her recent divorce. The physician prescribes an antidepressant. After a few weeks, Sarah’s depression lifts and she immediately swings into a serious manic phase, something that has not happened for over a year.

The use of antidepressants in bipolar disorder clients remains controversial. There is only limited evidence to support antidepressant treatment for bipolar depression.<sup>27</sup> If

antidepressants are used, it is generally recommended that a mood stabilizer be taken as well to prevent or reduce the risk for switching to manic or hypomanic phases or developing rapid cycling symptoms. In fact, research results from a large National Institute of Mental Health (NIMH) study showed that adding an antidepressant to a mood stabilizer “is no more effective in treating the depression than using only a mood stabilizer.”<sup>26</sup>

### Herbal preparations for use in bipolar disorder

Herbal preparations are, or have been, used to treat a multitude of illnesses and injuries. Herbal medicines also have been used by herbalists to treat bipolar disorder. Herbal preparations should never be used unless under the direction of a qualified herbalist and with the knowledge and approval of clients’ primary health care providers. As mentioned throughout this education program, it is absolutely imperative that clients

divulge if they are taking any herbal preparations. These preparations can produce significant adverse side effects as well

as interacting adversely with prescription, non-prescription and other herbal medicines.

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## Fish oils

Common names for fish oils include omega 3 fatty acids and omega 3 oils. Reported uses included prevention of cardiovascular disease and to treat depressive disorder, bipolar disorder and dysmenorrhea. Fish oils are available as capsules and in liquid form.<sup>19</sup>

There are no reported side effects or interactions with other herbs or foods. There is some evidence that fish oils may increase the risk of bleeding, so concurrent use with anticoagulants should be avoided. Fish oils should not be used in women who are pregnant or lactating, in children, or in clients with breast or prostate cancer or in known heart disease.<sup>19</sup>

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## Lecithin

Lecithin is found in commonly eaten foods such as eggs, peanuts and beef liver and can be found in capsule and tablet forms. It is used to lower cholesterol levels, treat hepatic disease and treat Alzheimer's disease and bipolar disorder.<sup>19</sup>

other herb interactions with lecithin. Lecithin may decrease cholesterol results.<sup>19</sup>

The most common side effects include nausea, vomiting, anorexia and hepatitis. There are no known drug, food or

Lecithin should not be used during pregnancy and lactation, nor should it be given therapeutically to children.<sup>19</sup>

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## Pharmacologic interventions for schizophrenia

Schizophrenia is the most debilitating of mental health disorders. It interferes with the ability to function at work and school and in society and interpersonal relationships.<sup>28</sup> Usually diagnosed in late adolescence or early adulthood, schizophrenia seldom becomes apparent in childhood. The incidence of onset peaks between 15 to 25 years of age for men and 25 to 35 years of age for women.<sup>16</sup>

The financial impact of schizophrenia is incredible. Clients with schizophrenia occupy about 10 percent of the hospital beds in the United States and cost an estimated 2 percent of the gross national product in missed work, public assistance and costs of treatment.<sup>28</sup> However, thanks to proper diagnosis, advances in community-based treatment and the effectiveness of newer atypical antipsychotic drugs, many people with schizophrenia are able to live in the community with family and societal support.<sup>16</sup>

It is estimated that schizophrenia affects about 1 percent of the worldwide population. In the United States, approximately 2.5 million people have schizophrenia.<sup>28</sup>

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## Signs and symptoms of schizophrenia

Schizophrenia is not a single illness, but is a syndrome with many different types and symptoms. Symptoms are primarily psychotic in nature and are divided into two major categories: positive or hard signs and symptoms and soft or negative signs and symptoms.<sup>16</sup>

- **Echopraxia:** Imitation or mimicking of the behaviors, movements and gestures of another person who is being observed by the client.
- **Associated looseness:** Poorly related thoughts and ideas.
- **Ambivalence:** Expression of contradictory beliefs about the same person or situation.

Hard or positive signs and symptoms include:<sup>16,28</sup>

- **Hallucinations:** These include false visual, auditory or tactile perceptions that do not exist in reality.
- **Delusions:** Fixed false beliefs that include distorted thoughts and perceptions.
- **Flight of ideas:** Constant verbalizations that rapidly move from one topic to another.
- **Perseveration:** Persistent verbalization regarding a single idea or topic. There may be continuous repetition of a word, sentence or phrase and attempts to change the topic or redirect the client are met with resistance.
- **Ideas of reference:** Clients' false beliefs that external events have particular meaning for them.

Soft or negative signs and symptoms include:<sup>16,28</sup>

- **Flat affect:** Lack of facial expression that would normally indicate feelings, moods or emotions.
- **Blunted affect:** Limited range of emotional expression.
- **Lack of volition:** Lack of will or ambition to take action.
- **Apathy:** Display of indifference toward people, situations or activities.
- **Alogia:** Little verbalization or expression of the substance of meaning of a situation.
- **Anhedonia:** Inability to feel joy or to take pleasure from life's activities or from interpersonal relationships.
- **Catatonia:** "Psychologically induced immobility occasionally marked by periods of agitation or

excitement.”<sup>16</sup> The client is sometimes described as being in a trance-like state and seems motionless.

There are several types of schizophrenia described by the DSM-IV-TR. Classification is dependent on presenting symptoms.

The various types are:<sup>16</sup>

- **Schizophrenia, paranoid type:** Characterized by feelings of persecution or grandiose delusions, hallucinations, delusions with a religious focus or hostile behavior.
- **Schizophrenia, disorganized type:** Characterized by significantly inappropriate or flat affect, incoherence and extremely disorganized behavior.
- **Schizophrenia, catatonic type:** Characterized by significant psychomotor disturbance, which can include either motionlessness or excessive motor activity.
- **Schizophrenia, undifferentiated type:** Characterized by mixed schizophrenic symptoms of other types accompanied by disturbances of thought, affect and behavior.
- **Schizophrenia, residual type:** Characterized by at least one prior but not current episode as well as social withdrawal, flat affect and looseness of association.

There is no known cure for schizophrenia. Treatment focuses on psychopharmacology in the form of antipsychotic medications, also known as neuroleptics. They are administered to reduce or control signs and symptoms.<sup>16,28</sup>

The older or “conventional” antipsychotic medications are dopamine antagonists, and the newer antipsychotics are both dopamine and serotonin antagonists.<sup>16</sup>

## Side effects of antipsychotic medications

The side effects of antipsychotic medications range from slight discomfort to serious, even incapacitating effects and permanent movement disorders.<sup>16</sup>

## Extrapyramidal side effects

Extrapyramidal side effects (EPS) are reversible movement and posture disturbances.<sup>30</sup> They include dystonic reactions, pseudo-parkinsonism, and akathisia.<sup>16</sup>

- Dystonic reactions are noted early in the course of medication treatment and are characterized by intermittent spasmodic or sustained involuntary contractions of discrete muscle groups in the face, neck, trunk, pelvis and extremities.<sup>31</sup> Spasms of the neck muscles are referred to as torticollis, and spasms of the eye muscles are referred to as oculogyric crisis. Spasms may be accompanied by tongue protrusion, dysphagia and laryngeal and pharyngeal spasms that can obstruct the airway and require emergency medical intervention. Dystonic reactions are treated with diphenhydramine (Benadryl) either I.M. or intravenously or with I.M. benztropine (Cogentin).<sup>16</sup>
- Pseudo-parkinsonism is neuroleptic medication-induced parkinsonism. The client exhibits a shuffling gait, drooling, muscle stiffness and akinesia (slowness and trouble initiating movement). This side effect is generally noticed within the first few days after beginning an antipsychotic

**Drug alert!** Two antipsychotics are available in depot injection forms for maintenance therapy. These are fluphenazine (Prolixin) and haloperidol (Haldol). These medications eliminate the need for daily oral antipsychotic medication. Their effects last for two to four weeks.<sup>16</sup>

Because of the enormity of the effects of the antipsychotic medications, this section of the program is divided as follows:

- Listing of conventional and atypical antipsychotics.
- Side effects of antipsychotic medications.
- Some specific information for each antipsychotic such as contraindications, drug interactions and impact on lab studies.

Conventional antipsychotics:<sup>4,16</sup>

- Chlorpromazine (Thorazine).
- Perphenazine (Trilafon).
- Fluphenazine (Prolixin).
- Thioridazine (Mellaril).
- Thiothixene (Navane).
- Haloperidol (Haldol).
- Trifluoperazine (Stelazine).

Atypical antipsychotics:<sup>4,16,29</sup>

- Clozapine (Clozaril).
- Risperidone (Risperdal).
- Olanzapine (Zyprexa).
- Quetiapine (Seroquel).
- Ziprasidone (Geodon).
- Paliperidone (Invega).
- Aripiprazole (Abilify).

**Drug alert!** The side effects can be so devastating to clients that they may discontinue taking them or reduce the amount of the drug that they take without medical approval. In fact, side effects are often cited as the main reason for discontinuing drugs.<sup>16</sup>

medication or after increasing the dose. Pseudo-parkinsonism is treated with a variety of medications such as benzoprine (Cogentin), diazepam (Valium), propranolol (Inderal) and amantadine (Symmetrel).<sup>16</sup>

- Akathisia is characterized by an inability to remain seated, accompanied by motor restlessness and feelings of quivering muscles.<sup>32</sup> Akathisia usually appears when an antipsychotic medication is initiated or when the dose is increased. The most effective treatment for akathisia is administration of beta-blockers. Benzodiazepines have also been found to be helpful.<sup>16</sup>

## Tardive dyskinesia

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Tardive dyskinesia is a late-appearing side effect.<sup>16</sup> It is characterized by involuntary movements of the tongue, lips, face, trunk and extremities. These movements include lip smacking, protrusion of the tongue, chewing, blinking and grimacing. These effects are embarrassing for the client and for persons observing them.<sup>16,33</sup>

**Drug alert!** Unfortunately, tardive dyskinesia is irreversible once it begins, but decreasing the dose or discontinuing the medication can stop the progression. However, clozapine (Clozaril) an atypical antipsychotic, has not produced this side effect and may be a good alternative for clients who experience tardive dyskinesia while taking conventional antipsychotic drugs.<sup>16</sup>

## Seizures

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Seizures, although they occur, are not a frequently seen side effect of antipsychotics. They occur in only 1 percent of clients who take antipsychotic medications. However, it is important

to note that clozapine (Clozaril) has an incidence of 5 percent for seizure occurrence. If seizures do occur, dosage should be lowered or the medication causing this side effect changed.<sup>16</sup>

## Neuroleptic malignant syndrome

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Neuroleptic malignant syndrome (NMS) is a life-threatening neurological disorder. It is characterized by high fever, sweating, unstable blood pressure, stupor, muscular rigidity, increased muscle enzymes and leukocytosis.<sup>16,34</sup> This

syndrome usually develops within the first two weeks of treatment, but can develop at any time during treatment.<sup>34</sup> An estimated 0.1 percent to 1 percent of all clients taking antipsychotics develop NMS.<sup>16</sup>

## Agranulocytosis

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Agranulocytosis, failure of the bone marrow to produce adequate white blood cells, is a hematologic disorder characterized by spontaneous gum bleeding and other systemic hemorrhages.<sup>16,30</sup> Agranulocytosis develops abruptly and causes progressive fatigue and weakness, followed by fever, chills and leucopenia. The client develops an ulcerative sore throat that upon inspection reveals oral lesions that are usually rough edged with a gray or black membrane.<sup>30</sup>

drug therapy. Clients must have their white blood cell counts monitored every week for the first six months of clozapine therapy and every two weeks after that.<sup>16</sup>

Clozapine (Clozaril) is the antipsychotic that has the potential to cause agranulocytosis, a potentially fatal side effect. Agranulocytosis does not usually appear immediately, but can develop as long as 18 to 24 weeks after the initiation of

**Drug alert!** Clozapine is dispensed every seven to 14 days only. In order to obtain a refill, the client's white blood cell count must be above 3,500 cells/mm.<sup>3,16</sup>

**Drug alert!** Many antipsychotic medications can cause false-positive results for many urinary results, such as amylase and urobilinogen.<sup>4</sup>

**Drug alert!** Many antipsychotic medications should be used with caution in persons exposed to extremes in temperature.<sup>4</sup>

## SPECIFIC ADDITIONAL POINTS OF INTEREST FOR ANTIPSYCHOTICS

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### Chlorpromazine (Thorazine)

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Chlorpromazine is contraindicated in clients with CNS depression, bone marrow suppression or subcortical damage. The drug must be administered cautiously in clients who are elderly or debilitated or who have severe cardiovascular disease, respiratory disorders, hypoglycemia or glaucoma.<sup>4,35</sup>

**Drug alert!** Clients taking chlorpromazine are particularly vulnerable to a sudden drop in blood pressure and to orthostatic hypotension.<sup>4</sup>

Drug interactions to be aware of include:<sup>4,35</sup>

- **Lithium:** Concurrent use may increase neurologic effects and requires close monitoring.
- **Antacids:** May interfere with absorption. Administration should be separated by at least two hours.

- **Anticonvulsants:** May lower seizure threshold. Monitor closely.
- **CNS depressants including alcohol:** May increase CNS depression. Concurrent use should be discouraged.
- **Oral anticoagulants:** May decrease anticoagulant effect. Monitor closely.
- **Centrally acting antihypertensives:** May interfere with antihypertensive effects. Monitor closely.
- **St. John's wort:** May cause photosensitivity. Avoid excessive sunlight exposure.

**Drug alert!** Chlorpromazine use may cause photosensitivity. Advise clients to avoid excessive sunlight exposure and to wear sunblock.<sup>4</sup>

Chlorpromazine may decrease hemoglobin and hematocrit. The drug may increase liver function test values and eosinophil count and decrease granulocyte, platelet, and white blood cell counts.<sup>4</sup>

## Perphenazine (Trilafon)

Perphenazine (Trilafon) is contraindicated in clients with CNS depression, blood dyscrasias, bone marrow depression, hepatic damage, subcortical damage and in clients receiving large doses of CNS depressants.<sup>4,35</sup> It should be used cautiously in clients who are elderly, debilitated, taking other types of CNS depressants or anticholinergics, or are going through alcohol withdrawal, psychotic depression or suicidal ideation. Perphenazine should also be used with caution in clients who have cardiovascular disease, renal disease or respiratory disorder.<sup>4,35</sup>

Drug interactions include:<sup>4,35</sup>

- **CNS depressants including alcohol:** CNS depression may increase. Use concurrently only with caution.
- **Antacids:** May interfere with perphenazine absorption. Separate administration by at least two hours.

## Fluphenazine (Prolixin)

Fluphenazine (Prolixin) is contraindicated in clients with CNS depression, bone marrow suppression or other types of blood dyscrasias, subcortical damage, or hepatic damage. As with other antipsychotics, fluphenazine should be used with caution in elderly or debilitated patients. It should also be used with caution in clients with severe cardiovascular disease because the drug may cause an abrupt drop in blood pressure, and in those with peptic ulcer, respiratory disorders, hypocalcemia, seizure disorder, mitral insufficiency, glaucoma or prostatic hyperplasia.<sup>4,35</sup>

Drug interactions are similar to some other antipsychotics and include:<sup>4,35</sup>

- **Antacids:** May interfere with drug absorption. Separate administration of antacids and fluphenazine by at least two hours.
- **Anticholinergics:** May increase anticholinergic effects and should be used together with caution.

## Thioridazine (Mellaril)

Thioridazine (Mellaril) is indicated in clients who fail to respond to at least two other antipsychotic drugs.<sup>4</sup> It is contraindicated in clients with:<sup>4,35</sup>

- CNS depression or coma.
- Severe hypertension or hypotension.
- Cardiac disease.
- Reduced levels of CYP2D6 enzyme.
- Long QT interval or history of arrhythmias.

Thioridazine is also contraindicated in clients who are taking fluvoxamine, propranolol, pindolol, fluoxetine, and drugs that

- **Barbiturates:** May decrease perphenazine effectiveness. Monitor client closely.
- **Fluoxetine, sertraline, tricyclic antidepressants:** May increase phenothiazine level. Monitor closely.
- **Lithium:** May increase adverse neurologic side effects. Clients must be monitored carefully.
- **St. John's wort:** May cause photosensitivity. Avoid excessive sunlight exposure.

**Drug alert!** Advise clients to avoid excessive sun exposure and to wear sunblock.<sup>4</sup>

Perphenazine may decrease hemoglobin and hematocrit and increase liver function test values and eosinophil count. White blood cell counts, granulocyte and platelet counts may be reduced.<sup>4,35</sup>

- **Barbiturates and lithium:** May decrease drug's effectiveness and increase the potential for anticholinergic effects. These drugs should be used with fluphenazine with caution.
- **Centrally acting hypertensives:** Antihypertensive effects may be decreased. Blood pressure must be carefully monitored.
- **CNS depressants including alcohol:** CNS depression may increase, especially affecting psychomotor skills. Alcohol use should be discouraged. If other drugs that are CNS depressants must be prescribed, the client must be carefully monitored.
- **St. John's wort:** Increases the potential for photosensitivity. The client should avoid excessive exposure to the sun and wear sun block.

As with some other antipsychotics, the risk for photosensitivity is increased with use of this drug. Encourage clients to avoid excessive exposure to sunlight and to wear sun block.<sup>4</sup>

Fluphenazine may increase liver function test results and eosinophil count. It may decrease hemoglobin and hematocrit as well as granulocyte, platelet, and white blood cell counts.<sup>4</sup>

inhibit CYP2D6 enzyme or that prolong the QT interval. It should be used with caution in elderly or debilitated patients.<sup>4</sup>

In addition to the drug interactions and photosensitivity reactions described with use of fluphenazine, clients who are taking antiarrhythmics may find that such drugs inhibit the metabolism of thioridazine and lead to additional arrhythmias. Concurrent use is contradicted.<sup>4</sup>

## Thiothixene (Navane)

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Thiothixene (Navane) is contraindicated in clients who are experiencing CNS depression, circulatory collapse, coma or blood dyscrasias. Thiothixene should be used with caution in clients who are elderly or debilitated, have a history of seizure disorders, cardiovascular disease, hepatic disease, glaucoma, prostatic hyperplasia, heat exposure, and in those who are dealing with withdrawal from alcohol.<sup>4,35</sup>

Drug alert! Thiothixene is not recommended for use in children less than 12 years of age.<sup>4</sup>

There are relatively few drug or environmental interactions compared to some other antipsychotics. These include:<sup>4</sup>

- **CNS depressants including alcohol:** Danger of increased CNS depression. Discourage concurrent use.
- **Sun exposure:** May increase photosensitivity reactions. Advise clients to avoid excessive exposure to sunlight and to wear sun block.

Thiothixene may increase or decrease white blood cell counts and decrease granulocyte counts.<sup>4</sup>

## Haloperidol (Haldol)

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Haloperidol is contraindicated in clients with CNS depression, coma and who have parkinsonism. It should be used with caution in clients who are elderly, debilitated, have a history of seizures or EEG abnormalities, allergies, significant cardiovascular disorders, glaucoma or history of urine retention. The drug should also be used with caution in clients who are taking anticonvulsants, anticoagulants, anti-parkinsonians or lithium.<sup>4</sup>

Drug interactions associated with haloperidol include:<sup>4,35</sup>

- **Anticholinergics:** May increase anticholinergic effects and glaucoma. Concurrent use should be avoided.

- **Antifungals, buspirone:** May increase the haloperidol levels.
- **Carbamazepine:** May decrease haloperidol level.
- **CNS depressants including alcohol:** May increase CNS depression and concurrent use should be avoided.
- **Lithium:** May lead to lethargy and confusion.
- **Methyldopa:** May lead to dementia.
- **Rifampin:** May decrease haloperidol level.

There are relatively few effects on lab tests. Haloperidol may increase liver function test results and increase or decrease white blood cell counts.<sup>4</sup>

## Trifluoperazine (Stelazine)

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Trifluoperazine (Stelazine) is contraindicated in clients with CNS depression, coma, bone marrow suppression or hepatic damage. It should be used with caution in persons who are elderly, debilitated or who have cardiovascular disease, seizure disorder, glaucoma or prostatic hyperplasia.<sup>4,35</sup>

**Drug alert!** Trifluoperazine should be used in children only if they are hospitalized or under extremely close supervision.<sup>4</sup>

Drug interactions include:<sup>4,35</sup>

- **Antacids:** May interfere with trifluoperazine absorption. Doses of these medications should be separated by at least two hours.
- **Barbiturates and lithium:** May decrease trifluoperazine's effectiveness.
- **CNS depressants including alcohol:** May increase sedative effects. Avoid concurrent use.

- **Centrally acting antihypertensives:** May interfere with the effectiveness of antihypertensives. Blood pressure must be monitored closely.
- **Propranolol:** May increase both propranolol and trifluoperazine levels.
- **Warfarin:** May decrease the effectiveness of oral anticoagulants. PT and INR must be carefully monitored.
- **St. John's wort:** May increase the risk of photosensitivity. Avoid excessive sunlight exposure.

**Drug alert!** Trifluoperazine may cause photosensitivity even without the concurrent use of St. John's wort. Advise clients to avoid excessive sunlight exposure and to wear sun block.<sup>4</sup>

Trifluoperazine may increase liver enzyme levels and decrease white blood cell and granulocyte counts.<sup>4</sup>

## Clozapine (Clozaril)

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Clozapine is given to clients who are quite ill and who do not respond to other antipsychotics. It causes significant risk of agranulocytosis.<sup>4,35</sup>

(For detailed information about agranulocytosis, see the section of this program that describes the side effects of antipsychotics).

The drug is contraindicated in clients with uncontrolled epilepsy, history of agranulocytosis, white blood cell count

below 3,500/mm<sup>3</sup>, severe CNS depression, coma, paralytic ileus and myelosuppressive disorders.<sup>4,35</sup>

**Drug alert!** Clozapine carries a black box warning stating that use of this drug with other psychotropic drugs and benzodiazepines may increase the risk of sedation and cardiac and respiratory arrest.<sup>4</sup>

Clozapine also has the additional following potential drug interactions:<sup>4,35</sup>

- **Bone marrow suppressants:** Has the potential to increase bone marrow toxicity. Concurrent use should be avoided.
- **Digoxin, warfarin, and other highly protein-bound drugs:** May increase these drug levels. Clients must be monitored closely for adverse side effects.
- **Ritonavir:** May increase clozapine levels and the risk of toxicity. Avoid concurrent use.
- **Alcohol:** May increase CNS depression. Alcohol use should be discouraged.
- **Phenytoin:** May decrease clozapine level and lead to “breakthrough” psychosis.

**Drug alert!** Smoking may decrease clozapine level. Encourage clients to stop smoking.<sup>4</sup>

## Risperidone (Risperdal)

Use of risperidone is contraindicated in breast-feeding women, pregnant women and elderly patients with dementia. It should be used with caution in clients who have prolonged QT interval, cardiovascular disease, cerebrovascular disease, dehydration, hypovolemia or history of seizures.<sup>4,35</sup>

Drug interactions include:<sup>4,35</sup>

- **Antihypertensives:** May increase hypotensive effects. Blood pressure must be carefully monitored.
- **Azole antifungals:** May increase the drug’s plasma level.
- **Carbamazepine:** May decrease the effectiveness of risperidone.

## Olanzapine (Zyprexa)

Olanzapine contains a black box warning stating that sedation and delirium have been noted following injections of this drug. Another black box warning states that olanzapine may increase the risk of cardiovascular or infectious deaths in elderly clients with dementia.<sup>4,35</sup>

**Drug alert!** Olanzapine is not approved in clients with dementia-related psychosis.<sup>4</sup>

Drug interactions include:<sup>4,35</sup>

- **Antihypertensives:** May increase antihypertensive effects. Monitor blood pressure closely.
- **Carbamazepine, omeprazole, rifampin:** May increase olanzapine clearance. Monitor drug levels closely.
- **Ciprofloxacin:** May increase olanzapine level and increase the risk of adverse side effects.
- **Diazepam:** May increase CNS effects.

## Quetiapine (Seroquel)

Quetiapine immediate release form is not approved for use in children less than 10 years of age. The extended release form is not approved for use in children younger than 18 years of age.<sup>4</sup>

Here are additional black box warnings for clozapine:<sup>4,35</sup>

- Increases the risk of fatal myocarditis.
- Orthostatic hypotension can occur and rarely, can be accompanied by respiratory or cardiac arrest.
- Seizures may occur, particularly in clients receiving large doses of the drug.
- The drug is not indicated for use in elderly clients with dementia-related psychoses.

Clozapine may increase glucose, cholesterol and triglyceride levels as well as eosinophil counts. The drug may decrease granulocyte and white blood cell counts.<sup>4</sup>

- **Clozapine:** May decrease the clearance of risperidone and increase the potential for toxicity.
- **CNS depressants including alcohol:** May increase the potential for additive CNS depression. Discourage concurrent use.
- **Fluoxetine and paroxetine:** May increase the risk of adverse side effects of risperidone.

As with other antipsychotics, sun exposure may increase the risk of photosensitivity. Tell clients to avoid excessive sun exposure and to wear sun block.<sup>4</sup>

Risperidone may increase prolactin level and decrease hemoglobin and hematocrit.<sup>4</sup>

- **Levodopa:** May cause antagonistic effects. Monitor client closely.
- **Fluoxetine:** May increase olanzapine level.
- **Fluvoxamine:** May increase olanzapine level.
- **Alcohol:** May increase sedative effects. Avoid concurrent use.
- **St. John’s wort:** May decrease olanzapine level.

**Drug alert!** Smoking may increase olanzapine clearance. Discourage smoking.<sup>4</sup>

Olanzapine may increase the following lab test results:<sup>4,35</sup>

- AST.
- ALT.
- GGT.
- CK.
- White blood cell count.
- Triglyceride levels.
- Eosinophil count.

The drug contains a black box warning that it may increase suicidal ideation in children, adolescents and young adults ages 18 to 24.<sup>4</sup>



Drug interactions include:<sup>4,35</sup>

- **Antihypertensives:** May increase antihypertensive effects.
- **CNS depressants including alcohol:** CNS effects may be increased. Avoid concurrent use.

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## Ziprasidone (Geodon)

Ziprasidone (Geodon) is contraindicated in elderly clients with dementia-related psychosis, persons with a recent myocardial infarction or uncompensated heart failure, persons with a prolonged QT interval or taking other drugs that prolong the QT interval.<sup>4,35</sup>

Drug interactions include:<sup>4,35</sup>

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## Paliperidone (Invega)

Paliperidone contains a black box warning contraindicating its use in elderly clients with dementia-related psychosis. It is also contraindicated in those with history of cardiac arrhythmias, congenital long QT syndrome, and in those with gastrointestinal narrowing. It should be used with caution in persons with a history of diabetes or seizures, cardiovascular disease and cerebrovascular disease.<sup>4,35</sup>

Drug interactions include:<sup>4,35</sup>

- **Anticholinergics:** May increase adverse side effects.

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## Aripiprazole (Abilify)

Aripiprazole (Abilify) has black box warnings noting that it is not approved for use in children with depression or in elderly persons with dementia-related psychosis. It should be used with caution in pregnant and lactating women and in clients with cardiovascular disease, cerebrovascular disease, a history of seizures, and in persons who exercise strenuously, take anticholinergics, or who are likely to suffer from dehydration.<sup>4,35</sup>

Aripiprazole is associated with the following drug interactions:<sup>4,35</sup>

- **Antihypertensives:** May increase antihypertensive effects.

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## Herbal supplement: Betal palm

Betal palm is a palm found in the tropics of Africa, in China, India and the Philippines. The leaves and nuts of the palm are used for medicinal purposes. Its reported uses by herbalists include the treatment of depression, schizophrenia and respiratory conditions. It should not be used during pregnancy or breast-feeding and should not be given to children. Clients with oral or esophageal cancers, ulcers, esophagitis or renal disease should not use betal palm.<sup>19</sup>

Betal palm may cause palpitations, dizziness, seizures, anxiety, insomnia, restlessness and acute psychosis as adverse side effects.<sup>18,19</sup>

- **Lorazepam:** May decrease lorazepam clearance and lead to increased CNS effects.

Quetiapine may increase liver enzymes, cholesterol and glucose levels. It may decrease white blood cell count, thyroid-stimulating hormone levels and T4.<sup>4,35</sup>

- **Antiarrhythmics:** May increase the risk of life-threatening arrhythmias. Concurrent use is contraindicated.
- **Carbamazepine:** May decrease ziprasidone level.
- **Drugs that decrease potassium or magnesium:** May increase the risk of arrhythmias. If used concurrently, it is important to monitor the levels of these electrolytes.

To date, there is no reported impact on lab test results.<sup>4</sup>

- **Antihypertensive:** May exacerbate orthostatic hypotension. Avoid concurrent use.
- **Drugs that prolong QTc interval:** May increase this prolongation. Avoid concurrent use.
- **Levodopa:** May have antagonistic effects on each other. Use concurrently with caution.
- **Alcohol:** May increase CNS sedation. Avoid concurrent use.

Paliperidone may increase both insulin and prolactin levels.<sup>4</sup>

- **Carbamazepine:** May decrease effectiveness of aripiprazole. Dose may need to be doubled and client monitored carefully.
- **CYP2A4 inhibitors:** Increases the risk of significant toxic effects. The dose of aripiprazole is decreased by half of the usual dose.
- **Alcohol:** Increases CNS side effects. Avoid concurrent use.

**Drug alert!** Grapefruit juice may increase the drug level. Instruct clients not to take the drug with grapefruit juice.<sup>4</sup>

Aripiprazole may increase glucose and CK levels.<sup>4</sup>

Betal Palm should not be used with the following drugs:<sup>19</sup>

- Anti-glaucoma drugs.
- Beta-blockers.
- Calcium channel blockers.
- Cardiac glycosides.
- Cholinergic drugs.
- Neuroleptics.

MAOIs and foods that contain tyramine used in conjunction with betal palm may increase the risk of hypertensive crisis.<sup>19</sup>

To date, there are no known interactions with other herbs or impact on lab tests.<sup>19</sup>

## Summary of nursing considerations

Client education is a crucial part of any pharmacology intervention. Nurses must not only relay information, but also assess whether clients and their families truly comprehend the impact of the drugs being administered.

To measure comprehension, clients and families should be able to:

- State the name of the drug(s) they are taking.
- Be able to read the name of the drug(s) being taken and remove them from any containers that house the drugs.
- Recognize visually as well as in writing the drug(s) being taken.
- Identify the dose and route of the drugs being taken.
- Explain the side effects of the drug(s) and when to seek medical intervention for such side effects.
- State what to do if a dose is missed or if overdose occurs.
- Explain safety precautions associated with drug(s) being taken. For example, if a drug lowers blood pressure, do clients and families know that it is necessary to change position slowly?
- Explain how to take drug(s). For example, they should know that aripiprazole should not be taken with grapefruit juice.
- Explain the importance of keeping follow-up appointments with health care providers or of having specific blood tests performed.

Clients and families should be given written patient education materials written in terms that the average client and family members can understand and in a language that they can understand.

**Teaching alert!** *It is imperative to measure the clients' and families' comprehension of patient education. Never simply ask*

*them, "Do you understand how to take your medications?" or other questions that can be answered simply with a yes or no response. To assess their comprehension have them actually explain how they will take the drugs, list side effects, etc.*

Health care professionals must also keep up-to-date on new medications, changes to safety recommendations by the FDA, and removal of drugs from the market. The FDA provides free updates via e-mail, text and so on about research findings and information about drugs. Several well-known, reputable health care organizations (e.g. [www.mayoclinic.com](http://www.mayoclinic.com)) offer extensive information about various diseases and their treatments written for clients, families and health care professionals.

**Teaching alert!** *Ask what websites clients and families are using to obtain information about their health and about their treatment regimen. Make sure that they are acquiring information from reputable sources.*

Emphasize the importance of telling health care providers what medications they are taking, including herbs, vitamins, dietary supplements and over-the-counter medications. Explain that any or all of such agents can have serious, even life-threatening interactions.

Finally, remember that clients and their families are equal partners with their health care providers. They must be encouraged to express their concerns and to ask questions. Compliance is not possible unless clients and families believe in the treatment regimen that has been prescribed.

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## PHARMACOLOGY: MENTAL HEALTH MEDICATIONS

### Self Evaluation Exercises

Select the best answer for each question and check your answers at the bottom of the page.

You do not need to submit this self-evaluation exercise with your participant sheet..

- In some cases, antidepressants may increase the risk for suicidal ideation, particularly in young adults and children.
  - True
  - False
- SSRIs are often prescribed for persons who wish to avoid sexual side effects.
  - True
  - False
- Smoking may lower the drug levels of cyclic antidepressants.
  - True
  - False
- taking MAOIs should be taught to avoid foods such as beer, aged cheeses, and soy products.
  - True
  - False
- Persons taking St. John's wort should consume foods that are high in tyramine.
  - True
  - False
- Recent studies suggest that some antidepressants interfere with the effectiveness of tamoxifen, a drug given as an adjuvant treatment for women with estrogen-positive breast cancer.
  - True
  - False
- After the last dose of disulfiram, its effects end abruptly and no adverse reactions occur if the client immediately begins drinking again.
  - True
  - False
- If antidepressants are used in the treatment of bipolar disorder, it is generally recommended that a mood stabilizer be taken as well to prevent or reduce the risk for switching to manic or hypomanic phases or developing rapid cycling symptoms.
  - True
  - False
- Clozapine is the antipsychotic prescribed if the client has a history of or high risk for agranulocytosis.
  - True
  - False
- When assessing client's comprehension of education regarding their treatment regimen, avoid asking questions that can be answered simply with a yes or a no.
  - True
  - False

Answers:	1.T 2.F 3.T 4.T 5.F 6.T 7.F 8.T 9.F 10.T
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