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July 2009 "Review of CFS & Fibromyalgia" #707-000-09-007-H01-P

THIS MONTH
Chronic Fatigue Syndrome & Fibromyalgia"

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For over a century, observant physicians have encountered an illness characterized by severe disability, physical & mental fatigue, pain that worsens with activity, and often associated with stress & psychological factors. Chronic fatigue syndrome is a relatively new term that is used to describe this illness. In the scope of this lesson emphasis is placed on CFS & fibromyalgia. Additionally, the overlap between these conditions will be addressed. This lesson provides 1.25 hours (0.125 CEUs) of credit, and is intended for pharmacists in all practice settings. **The program ID # for this lesson is 707-000-09-007-H01-P. Pharmacists completing this lesson by July 31, 2012 may receive full credit.**

To obtain continuing education credit for this lesson, you must answer the questions on the quiz (70% correct required), and return the quiz. Should you score less than 70%, you will be asked to repeat the quiz. Computerized records are maintained for each participant.

If you have any comments, suggestions or questions, contact us at the above address, or call toll free 1-800-323-4305. (In Alaska and Hawaii phone 1-847-945-8050). **Please write your ID Number (the number that is on the top of the mailing label) in the indicated space on the quiz page** (for continuous participants only).

The objectives of this lesson are such that upon completion the participant will be able to:

1. List risk factors for development of CFS.
2. Describe the diagnostic criteria associated with fibromyalgia.
3. Discuss the benefits of non-drug therapy in CFS & fibromyalgia.
4. Compare & contrast the FDA approved agents for treatment of fibromyalgia.

INTRODUCTION

Chronic fatigue syndrome (CFS) was classified as a disease 20 years ago, but it still remains a confusing problem to both patients and healthcare professionals.[1,2] For years people wondered if CFS was real, as many patients did not appear sick, and there was no specific test or marker for disease. Patients were often shuttled between physicians with little direction for how to manage their condition. In 1988, a definition of CFS was established. In 1993, the first criteria for the diagnosis of chronic fatigue syndrome were published. These criteria established CFS as a real disease and identified CFS as a public health concern. In 2003, the definition of CFS was refined and constitutes that operational criteria used today.

CFS is a prolonged fatigue that is accompanied by unrefreshed sleep, problems with memory and concentration, headache, muscle and joint pain and recurrent sore throat.[2] A key finding in CFS is a dramatic drop in physical activity and stamina.

EPIDEMIOLOGY

The disease is present in more than 1 million individuals in the United States.[3-5] However, less than 20% of patients with CFS have been diagnosed. Although CFS occurs more often than multiple sclerosis, lung cancer, Parkinson's disease or lupus, the majority of patients are not being identified. Chronic fatigue syndrome has a significant economic impact on the individual as well as the community. It has been noted that patients are ill for 5 to 7 years before a diagnosis was made. This is a debilitating condition and one-quarter of people diagnosed with CFS cannot maintain employment and rely on disability payments. Studies have shown that the United States loses approximately 9 billion dollars annually due just to the lost productivity of individuals with CFS.

Although CFS affects both sexes as well as all age, race and socioeconomic classes, there are some risk factors that have been identified.[1,3,6] This condition appears 4 times more frequently in women than men. It occurs in women aged 40-59 and is more common in non-Caucasian females, specifically in Latinos and African-Americans. There is evidence to suggest that individuals from lower socioeconomic groups may be at increased risk. Additional studies have suggested that there may be a genetic or environmental link. Exposure to childhood trauma; emotional, physical, sexual abuse or physical neglect increases the risk of CFS by 3 to 8 times. Stress associated with negative childhood experiences can manifest itself as CFS in adulthood.[7]

DIAGNOSIS

The diagnosis of CFS is one of exclusion.[2] Therefore, a complete physical examination and patient history is critical. There are no specific laboratory tests that can be used to identify patients with CFS; however, routine laboratory tests can be used to exclude other conditions. The diagnosis is based on an international case definition that is shown below in Table 1.

Table 1- International Case Definition- Chronic Fatigue Syndrome[2]

International diagnostic definition for Chronic Fatigue Syndrome: unexplained persistent or relapsing chronic fatigue that is of new or definite onset, that is unexplained by physical exertion; significant reduction in daily activities and work AND concurrent occurrence of 4 or more of the following:

- Postexertional malaise (lasting more than 24 hrs)
- Impaired short term memory or concentration
- Unrefreshing sleep
- Headaches
- Sore throat
- Muscle pain
- Multi-joint pain without swelling or redness
- Tender cervical or axillary lymph nodes
- Symptoms persist or recur > 6 months

It is important when evaluating a patient for CFS to exclude other conditions that may mimic CFS. [2,5] These conditions include mononucleosis, Lyme disease, sleep apnea, hypothyroidism, bipolar effective disorder, eating disorders, alcohol or substance abuse or severe obesity. Since many conditions can present with symptoms of fatigue and pain, healthcare professionals must be alert for other comorbid conditions in patients with CFS. These include: irritable bowel syndrome, interstitial cystitis, temporomandibular joint disorder and fibromyalgia. Fibromyalgia is reported in 30-70% of

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patients with CFS, so it is important to understand the differences between these two conditions. Fibromyalgia will be discussed later in this lesson.

TREATMENT OF CHRONIC FATIGUE SYNDROME

When developing a care plan for the treatment of CFS, there are 3 objectives.[8]

.1 The first goal is to relieve the symptoms of fatigue and pain.
2. Then it is necessary to teach the patient how to manage their activity levels to prevent post-exertional malaise, and finally
3. Help the patient develop methods to cope with this illness.

As pharmacists, our role is primarily involved with managing the drug therapy of the patient. However, we can maintain an awareness of various non-drug therapy options and encourage the patient to incorporate these techniques into their care plan. In addition, we can provide a supportive environment where patients can discuss their concerns and frustrations.

NON-PHARMACOLOGICAL TREATMENT

Although drug therapy is an important component of care in CFS, there are a number of non-drug therapy interventions that have significant benefit for this population.[5] Cognitive behavioral therapy is useful in helping patients deal with a life-changing condition. Chronic fatigue syndrome is a condition that radically changes an individual's activity level, affects the patient's daily activities and their ability to work. It is important to provide them with an outlet to help develop realistic goals and effective coping strategies. Some patients report an improvement in fatigue and activity level with cognitive behavior therapy. Other non-drug therapies that have shown benefit in CFS include:

- Graded exercise therapy
- Massage and healing touch
- Yoga and Tai Chi
- Acupuncture
- Meditation
- Biofeedback

PHARMACOLOGICAL TREATMENT

There are currently no effective therapies to treat CFS.[9,10] So therapy is aimed at managing the symptoms. Common complaints that patients present with include: sleep problems, muscle or joint pain, fatigue, headaches, cognitive dysfunction and postexertional malaise. Other problems that may require therapy in some patients include gastrointestinal symptoms, orthostatic hypotension and depression. A number of medications have been studied in the treatment of CFS; however, none have been shown to demonstrate clear benefit. Table 2 summarizes the medications used to treat CFS.

Table 2- Medications used to treat Chronic Fatigue Syndrome [9,10]

Therapeutic Class	Agents	Role in therapy
Tricyclic antidepressants TCAs)	Amitriptyline, nortriptyline	Small controlled trials have shown mixed benefits of therapy at 8-12 weeks. Use of TCA in low dose may have some utility in treating depression, insomnia or myalgia.
Antihistamines	Terfenadine	Randomized, placebo-controlled trial of terfenadine 60mg twice a day. No benefit of terfenadine in CFS.
Stimulants	Methylphenidate	Double-blind, randomized trial of 60 patients with CFS. Patients received placebo or 10mg methylphenidate twice a day. Methylphenidate showed improvement in fatigue in 17% of patients and improved concentration in 22% of patients. Methylphenidate had minimal benefit in CFS. Further studies are needed.

Patients with CFS can become frustrated with traditional therapies and seek alternative agents for relief of their symptoms.[5,11] Some of these programs are gimmicks at best. It is important to discuss the potential risks of these products with your patients. Nutritional supplements containing high doses of vitamin B12, essential fatty acids or co-enzyme Q10 have not been shown to have any clinical effects in CFS. A number of herbal products have been touted for use in CFS; however, there may be risks in using them. They include:

Herb	Reason to avoid in CFS
comfrey	lethargy, fatigue
ephedra	anxiety, myalgia
kava	avoid in depression
germander	hepatitis
chapparal	fatigue, fever
bitter orange	avoid with some antidepressants
licorice root	lethargy, myopathy
yohimbe	insomnia, headache, hypertension

FIBROMYALGIA—-INTRODUCTION

Like CFS, fibromyalgia is a disease that has been misunderstood and under-diagnosed for many years. In 1990 the American College of Rheumatologists established criteria for diagnosis, similar to the process that was undertaken to develop diagnostic criteria for CFS.[12] In 2005, the American Pain Society (APS) developed evidence-based treatment guidelines to suggest appropriate therapy. In 2008, the European League Against Rheumatism (EULAR) published updated guidelines.[13]

EPIDEMIOLOGY

Fibromyalgia is the second most common rheumatologic disorder after osteoarthritis.[14-16] It is estimated that 12 million people have fibromyalgia in the United States. It is a chronic condition that consists of widespread musculoskeletal pain, fatigue, non-restorative sleep and specific trigger pain points. It is seen most commonly in women between the ages of 20-50, and is 10 times more common in women than men. The incidence of fibromyalgia increases with age and is projected to be present in 7% of women over the age of 65. Although uncommon, it has been reported in children and adolescents.

DIAGNOSIS

When making the diagnosis of fibromyalgia, the physician should conduct a comprehensive physical examination and assess pain at the 18 pressure points identified in the guidelines.[16] Fibromyalgia is defined as widespread musculoskeletal pain (occurring > 3 months) in all 4 quadrants of the body, sleep disturbances and tenderness at 11 of 18 pressure points. Patients with fibromyalgia often have additional complaints including:

- Migraine headaches
- Irritable bowel syndrome
- Memory loss
- Cognitive impairment
- Tingling of hands and feet
- Painful menstruation
- Allodynia (pain from a stimulus that is not normally painful)

As stated earlier, up to 70% of patients with fibromyalgia also suffer from CFS.[17] Up to 30% of fibromyalgia patients suffer from depression, while 25-60% of fibromyalgia patients have other rheumatic diseases such as rheumatoid arthritis or lupus.

TREATMENT

As with CFS, management of fibromyalgia often requires multi-modal therapy. Since 2007, 3 drugs have been approved by the Food and Drug Administration for the treatment of fibromyalgia. These agents are duloxetine (Cymbalta®), milnacipran (Savella®) and pregabalin (Lyrica®).

DULOXETINE (CYMBALTA®)

Pharmacology/Pharmacokinetics

Duloxetine is a selective serotonin and norepinephrine reuptake inhibitor (SNRI).[18] It was approved for use in fibromyalgia in 2008. The mechanism of action of duloxetine in fibromyalgia is not clear. However, patients with fibromyalgia have altered serotonin levels. Serotonin acts on fibromyalgia symptoms through various mechanisms. Serotonin inhibits the release of the pain neurotransmitter, Substance P in the brain, and it is necessary for deep sleep (delta or phase 4 sleep). Fibromyalgia patients also suffer from a reduced outflow of norepinephrine from the spinal cord resulting in hyperalgesia.

Duloxetine is well absorbed after oral administration and is more than 90% plasma protein bound.[18] The drug is extensively metabolized via CYP1A2 and CYP2D6 pathways to inactive metabolites. The elimination half-life of duloxetine is 12 hours. Approximately 70% of the drug is excreted in the urine and 20% in the feces.

Dosing

The initial dose of duloxetine for fibromyalgia is 30 mg once a day for 7 days.[18,19] The dose is then increased to 60 mg once a day. Higher doses (120mg) have shown no benefit and result in more adverse effects. No dose adjustments are needed in elderly patients; however, the drug should not be used in severe renal impairment or in patients with liver disease. Duloxetine can be given without regard to meals. Patients should wait a minimum of 14 days after discontinuing a monoamine oxidase inhibitor before starting duloxetine. Wait approximately 5 days after discontinuation of duloxetine before initiating a monoamine oxidase inhibitor. Duloxetine should be slowly tapered when discontinuing treatment.

Contraindications

Duloxetine is contraindicated in patients who are receiving monoamine oxidase inhibitors or who have uncontrolled narrow angle glaucoma.[15,18] In addition, duloxetine carries a black box warning regarding suicide as do other SNRIs. Children, adolescents and young adults who have major depressive disorders are at increased risk of suicidal ideation. Patients should be closely monitored for clinical worsening or unusual changes in behavior.

Drug Interactions

There are a number of potential drug-drug interactions with duloxetine.[18] Since duloxetine is metabolized via the CYP1A2 and CYP2D6 pathways, agents that are potent inhibitors of these pathways should be used with caution. Potent inhibitors of CYP1A2 include fluvoxamine, cimetidine and quinolone antibiotics. Agents that are potent inhibitors of CYP2D6 include paroxetine, fluoxetine, and quinidine.

Duloxetine may increase the risk of bleeding and should be used with caution in patients receiving warfarin, aspirin, NSAIDs and antiplatelet agents.[15,18,19] Caution should be used when co-administering duloxetine with other agents that affect serotonin, to prevent serotonin syndrome. Other agents that can affect serotonin include triptans, linezolid, lithium, tramadol, St. John's Wort and tryptophan. Since duloxetine is >90% plasma protein bound, it should be used with caution when combined with other drugs that are highly protein bound.

Adverse Effects

The most frequently reported adverse effects seen with duloxetine include nausea, dry mouth, somnolence, hyperhidrosis, constipation, and anorexia.

Fatal hepatic failure has been reported with duloxetine.[15] Patients present with hepatitis, abdominal pain and highly elevated serum transaminases. Patients may or may not have jaundice. If hepatotoxicity is suspected, duloxetine should be discontinued immediately.

Orthostatic hypotension has also been reported with duloxetine treatment.[18,19] To prevent orthostatic hypotension, the first 7 days of treatment should be initiated with lower than a 30 mg dose. Then the dose can be escalated to 60 mg daily.

It is important to note that duloxetine may be associated with urinary hesitancy.[18] This is significant since fibromyalgia patients may also have interstitial cystitis as a concomitant illness. Patients with interstitial cystitis may suffer from urinary hesitation and may find that it becomes worse when adding duloxetine. Duloxetine is Pregnancy Category C, and it is not known if duloxetine is excreted into breastmilk.

MILNACIPRAN (SAVELLA®)

Pharmacology/Pharmacokinetics

Milnacipran is a selective serotonin and norepinephrine reuptake inhibitor.[20] It was approved in 2009 for the treatment of fibromyalgia. Its mechanism of action in fibromyalgia is not clearly understood. It is thought to work due to its effects on norepinephrine and serotonin reuptake inhibition. Milnacipran inhibits norepinephrine with 3 times more potency than serotonin.

Milnacipran is well absorbed after oral administration and is only minimally bound to plasma proteins.[20] Milnacipran does not undergo significant metabolism through the CYP450 system and approximately 55% of the drug is excreted unchanged in the urine. The elimination half-life is 6 to 8 hours.

Dosing

When starting milnacipran, patients should be instructed to titrate the dose using the following guideline:

Day 1	12.5mg once a day
Day 2	12.5mg twice a day
Day 3	12.5mg twice a day
Day 4	25mg twice a day
Day 5	25mg twice a day
Day 6	25mg twice a day

Day 7	25mg twice a day
Day 8	50mg twice a day

Then continue dose of 50mg twice a day. The dose of milnacipran can be taken without regard to meals. In patients with a CrCl less than 30 ml/min, the dose of milnacipran should be decreased to 25mg twice a day. No dosage adjustment is needed in patients with liver impairment.[19,20]

Wait a minimum of 14 days after discontinuing a monoamine oxidase inhibitor before starting milnacipran.[19,20] Wait approximately 5 days after discontinuation of milnacipran before initiating a monoamine oxidase inhibitor. Milnacipran should be slowly tapered when discontinuing treatment.

Contraindications

Milnacipran is contraindicated in patients who are receiving monoamine oxidase inhibitors or who have uncontrolled narrow angle glaucoma.[20] As with other SNRIs, milnacipran carries a black box warning regarding suicidality. Children, adolescents and young adults who have major depressive disorder are at increased risk of suicidal ideation. Patients should be closely monitored for clinical worsening or unusual changes in behavior.

Drug Interactions

Since milnacipran undergoes only minimal metabolism via CYP450, there are no significant interactions with other drugs that are metabolized via CYP450.[19] The drug interactions reported with milnacipram are shown in Table 3.

Table 3- Drug interactions with milnacipran[19,20]

Effect

Drug	Effect
Lithium, triptans, tramadol, MAOIs, St. John's Wort	Serotonin syndrome
Epinephrine, norepinephrine	Arrhythmia, hypertension
Digoxin	Postural hypotension, tachycardia
Clonidine	Decrease clonidine effects
Clomipramine	Euphoria, postural hypotension
Warfarin, aspirin, NSAIDs and antiplatelet agents	Increased risk of bleeding

Adverse Effects

The most common adverse effects reported with milnacipram include nausea, headache, constipation, dizziness, hyperhidrosis, insomnia, palpitations, dry mouth and hypertension.[20] Since milnacipran is a more potent norepinephrine reuptake inhibitor, there are more potential cardiac adverse effects than those seen with duloxetine.

It is important to note that milnacipran may be associated with urinary hesitancy.[20] This is important since fibromyalgia patients may also have interstitial cystitis as a concomitant illness. Patients with interstitial cystitis may suffer from urinary hesitation and may find that it becomes worse when adding milnacipran. Milnacipran is Pregnancy Category C and it is not known if it is excreted into breastmilk.

PREGABALIN (LYRICA®)

Pharmacology/Pharmacokinetics

Pregabalin was the first agent approved in the United States for the treatment of fibromyalgia.[15,21] It is an anticonvulsant agent that has been shown to be affective in a number of chronic pain conditions, including diabetic neuropathy, postherpetic neuralgia and fibromyalgia. The mechanism of action of pregabalin in fibromyalgia is unclear but it is thought that pregabalin's antinociceptive (increased tolerance for pain) action is due to its effects on the calcium channels in the central nervous system.

Pregabalin is well absorbed after oral administration and does not bind to plasma proteins. The drug does not undergo significant metabolism and approximately 90% is excreted unchanged in the urine. The elimination half-life of pregabalin is 6.3 hours.

Dosing

The initial dose of pregabalin in fibromyalgia is 75mg twice a day.[21,22] The dose may be increased to 150mg twice

a day after the first week. The maximum dose of pregabalin is 225mg twice a day (450 mg/day). Doses above this resulted in an increase in adverse effects with no improvement in symptoms. The dose of pregabalin should be decreased in patients with renal impairment according to the information in Table 4.

Table 4- Renal dosing of pregabalin

CrCl (ml/min)	Pregabalin dose (mg/day)			Regimen	Post dialysis dose*
30 to 60	75	150	225	BID or TID	
15 to 30	25-50	75	100-150	QD or BID	
< 15	25	25-50	50-75	QD	

*If patient is taking 25mg daily, give 25 or 50mg supplemental dose
If patient is taking 25-50mg once a day, give 50 or 75mg supplemental dose
If patient is taking 50-75mg once a day, give 75 or 100mg supplemental dose
If patient is taking 75mg once a day, give 100-150mg supplemental dose

No dose adjustment is needed in liver disease. Doses can be taken without regard to meals. When discontinuing pregabalin, the drug should be slowly tapered. It should not be stopped abruptly.

Contraindications

Pregabalin is contraindicated in any patients with hypersensitivity to pregabalin or other components of the dosage form.[21,22]

Drug Interactions

There are no clinically significant drug interactions with pregabalin.[21]

Adverse Effects

The most frequently reported adverse effects of pregabalin include dizziness, somnolence, dry mouth, and edema, difficulty with concentration, blurred vision and weight gain. As with other anticonvulsants, pregabalin increases the risk of suicidal thoughts regardless of the reason it is being taken. All patients should be closely monitored for new or worsening depression, suicide thoughts, or unusual changes in behavior.[21]

Angioedema has been reported with pregabalin in patients who are starting therapy as well as those on chronic therapy.[21] Patients should be warned about angioedema and the drug should be stopped immediately if this occurs. Pregabalin is pregnancy category C. It is not known if pregabalin is excreted in the breastmilk.

OTHER TREATMENTS

Although these are the only agents with FDA approval for treatment of fibromyalgia, other drugs have been used.[15] Tricyclic antidepressants (TCA), such as low dose (10-50mg) amitriptyline have been used extensively to treat fibromyalgia prior to the availability of the above agents. The use of amitriptyline was based on its affect on neurotransmitters. It is a serotonin reuptake inhibitor and has mild effects on norepinephrine reuptake. Amitriptyline has been used clinically in a number of chronic pain syndromes, such as interstitial cystitis and CFS. It also has sedative properties which help with the sleep disorders seen in fibromyalgia. Clinical trials with fibromyalgia have shown up to 45% of patients taking TCAs have moderate improvement in pain and sleep.

Selective serotonin reuptake inhibitors (SSRIs) have also been used to treat fibromyalgia.[15] These agents were used in an attempt to alleviate the adverse effects reported with TCAs. It is important to note that agents that are more selective of serotonin (e.g. citalopram) appear to be less effective than non-selective agents such as fluoxetine. The SSRIs have been reported to improve the cognitive dysfunction seen in fibromyalgia.

Since pain is a major symptom of fibromyalgia, this is an area that patients have tried a number of products. Nonsteroidal anti-inflammatory agents have not been shown to be effective in the management of fibromyalgia pain.[15] Since opioid analgesics can cause impaired cognition, daytime sedation and sleep disorders, these agents should generally be avoided in fibromyalgia. Many physicians have given patients narcotics in an attempt to manage their pain, resulting in a dependence on opiates including agents like Vicodin or Oxycontin. Although these agents may actually be aggravating their fibromyalgia, they cannot or will not consider an alternative approach.

However, tramadol, a centrally acting opiate analgesic has been used for its effects in pain in fibromyalgia. The

mechanism of action of tramadol appears to be through the inhibition of norepinephrine and serotonin reuptake. Clinical trials have shown that tramadol is more effective than placebo for trigger pain of fibromyalgia. Pharmacists need to monitor the use of tramadol in fibromyalgia patients because of the potential for serotonin syndrome, when it is combined with drugs that impact serotonin. Agents to avoid with tramadol include antidepressants, cyclobenzaprine, St. John's Wort and S-adenosylmethionine (SAM-e), since they can precipitate serotonin syndrome when combined with tramadol. Another agent used for trigger pain is lidocaine transdermal patches. One proposed mechanism of pain relief is that transdermal lidocaine blocks sodium channels resulting in down regulation of pain transmission. The patches are applied to specific trigger points.

Agents that may improve sleep, such as zolpidem (Ambien) or eszopiclone (Lunesta) have been used in fibromyalgia patients.[15] Improvement of sleep results in more daytime energy and improvement in symptoms. Fibromyalgia patients may often receive prescriptions for benzodiazepine sedatives; however, there are risks of dependence with these agents.

ROLE OF THE PHARMACIST

The pharmacist can help both the fibromyalgia and the chronic fatigue syndrome patient cope with their conditions by educating the patient and the patient's family about the illness and medications. The pharmacist can evaluate the patient's response to medication and answer any questions the patient may have about treatment options.

Patients can be frustrated if they are not finding relief through conventional medications and often search out alternative options. There are a number of questionable treatments available on the internet that patients may learn about. Many of these programs may be scams. The pharmacist can provide a balanced perspective on the risks and benefits of these treatments. Some of these treatments may interact with medications that the patient is taking.

Many pharmacists maintain a list of qualified massage therapists, yoga programs or meditation tapes to support patients with chronic medical conditions such as CFS and fibromyalgia. The pharmacist may want to contact the local community center to identify exercise programs, acupuncture or massage therapy programs that they can refer patients to. When pharmacists have information available regarding support groups, this can be useful to the patient. A good resource for fibromyalgia information is the National Fibromyalgia Association at http://www.fmaware.org/site/PageServer. Making your pharmacy a resource for non-drug treatments provides a great service to all of your patients, not just those with fibromyalgia. Having yoga mats, yoga videos, relaxation tapes and meditation books may also make good business sense as patients can purchase these items at your pharmacy.

PATIENT CASE #1

JF is a 32 year old female who was diagnosed with fibromyalgia in 2008. She has been taking amitriptyline 25mg twice a day with some benefit. She reported significant daytime sleepiness that was interfering with her ability to be productive at work. She also complains of dry mouth and a 10 pound weight gain. JF presents at your pharmacy with a new prescription for Cymbalta 60 mg once a day. She has a bottle of Advil that she would like to purchase as well.

What is your strategy for counseling this patient?

There are some important points that need to be discussed with this patient regarding this new prescription. Explain that duloxetine works in the same manner that amitriptyline does by balancing the chemicals serotonin and norepinephrine in our body.

1. Discuss the potential drug-drug interaction between duloxetine and Advil. The combination of these agents may increase the risk of bleeding and bruising.
2. You may wish to explain that NSAIDs have not been shown to have any real benefit in the management of pain associated with fibromyalgia
3. Counsel JF about the adverse effects of duloxetine. She may experience lightheadedness or dizziness. Although dry mouth occurs less frequently with duloxetine, it may occur. If the dry mouth is bothersome, encourage JF to suck on ice chips or hard candy. Explain the risk of liver damage with duloxetine. Reinforce the importance of follow up with her physician if she experiences any side effects.
4. Since you know that JF is considering another child, it may be prudent to point out that duloxetine is Pregnancy Category C. She will want to avoid pregnancy while taking this medication.
5. You reinforce your understanding of the chronic nature of fibromyalgia and encourage JF to discuss any concerns she has about the disease. You encourage her to browse your patient support section which contains information on local yoga classes and relaxation tapes.
6. Since she is comfortable discussing her condition with you, she also tells you that she has been reading on the internet about nutritional products that can be helpful in fibromyalgia. You inform her that some of these products may have limited value. Encourage her to provide you with information on the product and offer to investigate its efficacy for her.

PATIENT CASE #2

RL is a 53 year old female with Chronic Fatigue Syndrome diagnosed in 2007. She is no longer able to work due to the debilitating nature of her CFS. She is very depressed and is always looking for new "cures" for her condition. She comes into your pharmacy to purchase yohimbe as she has heard that it is helpful in CFS. Her current medication list includes:

1. Prozac 20mg twice a day
2. Ambien CR 12.5mg at bedtime
3. Vicodin 1 tablet every 6 hours as needed for pain
4. Synthroid 0.5mg once a day
5. What are your concerns about RL's medications?

Yohimbe has been promoted as an herbal remedy for depression, because it blocks monoamine oxidase. However, this is only found in higher doses (over 50 mg/day), which is potentially unsafe. RL is currently taking fluoxetine (Prozac) which can result in a hypertensive crisis when combined with an MAO inhibitors.

It is important to reinforce to RL that you understand her frustration about her condition and that you are there to help her make appropriate decisions about alternative therapies that can enhance her quality of life.

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REMAINING TOPICS FOR 2009

Herbals	**Hormone Replacement Therapy**
Parkinson's Therapy	**MRSA**

Fill in the information below, answer questions and return **Quiz Only** for certification of participation to:
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LESSON EVALUATION

Please fill out this section as a means of evaluating this lesson. The information will aid us in improving future efforts. Either circle the appropriate evaluation answer, or rate the item from 1 to 7 (1 is the lowest rating; 7 is the highest).

1. Does the program meet the learning objectives?

List risk factors for development of CFS	Yes	No
Describe diagnostic criteria associated with fibromyalgia	Yes	No
Discuss the benefits of non-drug therapy in CFS & fibromyalgia	Yes	No
Compare & contrast the FDA approved agents for treatment of fibromyalgia	Yes	No

2. Was the program independent & non-commercial Yes No

	Poor			Average			Excellent
3. Relevance of topic	1	2	3	4	5	6	7

4. What did you like most about this lesson?_____

5. What did you like least about this lesson?_____

Provide The Best Answer(s)

1. CFS occurs most commonly in:
   A. Women age 40-59
   B. Latinos & African Americans
   C. Higher socioeconomic groups
   D. A & B only
2. Other conditions often seen with CFS include:
   A. Diabetes
   B. Fibromyalgia
   C. Interstitial cystitis
   D. B & C only
3. CFS is defined as persistent or relapsing chronic fatigue that occurs for > 6 months & is accompanied by at least 4 concurrent problems. These conditions can include:
   A. Headache
   B. Sore throat
   C. Unrefreshing sleep
   D. Multi-joint pain without swelling
   E. All of these
4. The maximum dose of pregabalin is:
   A. 225 mg/day
   B. 500 mg/day
   C. 200 mg/day
   D. 450 mg/day
5. Fibromyalgia is the most common rheumatologic disorder in the U.S.
   A. True B. False
6. Which of these should be avoided when using duloxetine?
   A. Hydrochlorothiazide
   B. Lithium
   C. Metformin
   D. Azithromycin
7. Both milnacipran & duloxetine should be used with caution in patients taking aspirin or NSAIDs.
   A. True B. False
8. Non-drug therapies for CFS include:
   A. Bicycling
   B. Yoga
   C. Acupuncture
   D. Meditation
   E. B, C & D only
9. Drugs that interact with pregabalin include:
   A. Aspirin
   B. Metformin
   C. Propranolol
   D. Linezolid
   E. None interact with pregabalin
10. Fibromyalgia is a chronic fatigue disease with sleep disturbances & pain points that occurs in 12 million Americans; is 10 times more common in women & can occur in children & adolescents.
    A. True B. False

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