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Volume Three

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CE-Accredited Monograph

Treating Chronic Pain in the Shadow of Addiction

Penelope P. Ziegler, MD, FASAM

"You can only come to the morning through the shadows."
—J. R. R. Tolkien
(1892 - 1973)

Activity Release Date: February 9, 2007

Period of Validity: February 9, 2010

PROGRAM OVERVIEW

Balancing the treatment of chronic pain and the risk of development or exacerbation of addictive disorder remains a medical challenge Patients have a right to the most effective and rapid pain relief available At times, this edict necessitates the treatment of a chronic pain patient who is at risk of addiction, or with active addictive disorder, with opioids After conducting a comprehensive assessment of the patient and the reported pain, a strategic stepwise therapeutic approach is considered a rational method to improve care and contain risk

The program will address these issues, as well as assist clinicians in identifying aberrant behaviors suggestive of addictive disorder, and provide suggestions and recommendations for treating chronic pain patients who present with or develop addictive disorder

TARGET AUDIENCE

This activity is designed for physicians, pharmacists, physician assistants, and nurses who have an interest in enhancing their knowledge and understanding of pain management

LEARNING OBJECTIVES

Upon completion of this activity, participants should be able to

- Differentiate the five steps of chronic pain management
- Describe three aberrant behaviors attributed to chronic pain patients with addictive disease
- Identify three benefits that are derived from using a strategic precautionary approach to patient assessment and management for the chronic pain patient
- Illustrate at least one activity related to deployment of an exit strategy

GENERAL INFORMATION

This activity is eligible for credit through February 9, 2010 After this date, this activity will expire and no further credit will be awarded

There are no fees for participating in this activity All participants must complete the Activity Evaluation Form Participants must receive a minimum score of 70% on the self-assessment portion of the form to qualify for CE credit Certificates may be printed immediately after completing the online self-assessment and evaluation

This activity is supported by an independent educational grant from Cephalon

FACULTY BIOGRAPHY

Dr Penelope P Ziegler, FASAM, is medical director emeritus of Williamsburg Place and the William J Farley Center in Williamsburg, Virginia Dr Ziegler is a board certified addiction psychiatrist and certified fellow of the American Society of Addiction Medicine She is also an associate clinical professor of psychiatry at Virginia Commonwealth University in Richmond, Virginia

Dr Ziegler has been working in the field of addiction medicine for more than 20 years She currently serves on the Board of Directors for both the American Society of Addiction Medicine and American Academy of Addiction Psychiatry Her special interests include addictive disease in health care professionals and women, the relationship of addiction in sexual trauma, and the challenging relationship of pain and addiction

ACCREDITATION

CME CREDIT

Accreditation Statement This activity has been planned and implemented in accordance with the Essential Areas and Policies of the Accreditation Council for Continuing Medical Education (ACCME) through the joint sponsorship of MediCom Worldwide, Inc and Medical Learning Solutions MediCom Worldwide, Inc is accredited by the ACCME to provide continuing medical education for physicians

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FACULTY FINANCIAL DISCLOSURE STATEMENT

The presenting faculty reported the following Dr Penelope Ziegler has disclosed that she has no significant relationships with the grantor Cephalon, Inc or any other commercial company whose products and services may be related to her presentation

PLANNER AND PROVIDER FINANCIAL DISCLOSURE

The individuals listed below from MediCom Worldwide, Inc reported the following for this activity Joan Meyer, executive director and Alan Vogenberg, RPh, FASCP, clinical advisor have nothing to disclose

Jeffrey Gudin, MD was the clinical reviewer for this activity and has nothing to disclose Ruth Widmer, medical writer of Corona Productions has nothing to disclose

CONFLICT OF INTEREST RESOLUTION

To identify and resolve conflicts of interest the educational content was fully peer reviewed by a member of the MediCom Worldwide, Inc Clinical Content Review Committee who has nothing to disclose The resulting activity was found to provide educational content that is current, evidence based, and commercially balanced

OFF-LABEL/INVESTIGATIONAL DISCLOSURES

In accordance with MediCom Worldwide, Inc policy, the audience is advised of the following disclosures regarding unlabeled or unapproved uses of drugs or devices Dr Ziegler indicated that her presentation would include the discussion of anticonvulsants and tricyclic antidepressants in the treatment of chronic pain These drugs are not approved by the FDA for this use in the United States

Dr Ziegler indicated that her presentation would not include the discussion of products that have not been approved by the FDA for any use in the United States

Introduction

In spite of important changes in pain medicine, including the increased use of opioids in the treatment of nonmalignant pain, increased acceptance of long-term use of opioids to treat all types of pain, and the existence of more than 30 assorted professional organizations that publish guidelines and protocols, pain remains effectively mismanaged [1-6] In 1999, the Joint Commission on Accreditation of Healthcare Organizations (renamed the Joint Commission in January 2007) released standards of care for patients in pain They suggested that pain be considered the fifth vital sign and indicated that all patients in pain reserve the right to treatment These standards, of course, included patients with active addictive disease and those patients with a history of addiction in recovery [7]

As opioids are increasingly prescribed for patients without cancer pain, the rate of misuse of these medicinal drugs is on the rise. It is reported that 56% more Americans abuse opioid prescription drugs than abuse cocaine, heroin, hallucinogens, and inhalants combined [8] These activities have created a serious public health problem, as evidenced by the following reported data collected from 1992 to 2003 The number of Americans abusing drugs increased by 94%, and abuse by children, ages 12-17, during the same period increased by 212% A 542% increase in addiction to prescribed opioids alone was also reported.[9] Some of these reported statistics may reflect diversion or misuse of prescribed opioids by nonpatients, however, even when opioids are appropriately prescribed to an individual with a history of a substance abuse disorder, these drugs may precipitate a craving for and relapse to the original drug of choice, or may initiate an addiction to a new, previously unknown substance [10]

In light of this information, it may seem an impossible task to be able to treat pain in an addicted individual This is not the case With proper assessment, a strategic stepwise approach to therapeutic management, a full complement of health care professionals, and detailed documentation, treatment is not only possible, it is achievable

A Stepwise Approach to Chronic Pain Management

How do we, as clinicians, recognize the addicted pain patient, one who may be in the recovery process for addiction, or one who may be at risk of addiction? The answer is, with much difficulty Although survey assessment tools exist, none offers 100% sensitivity If we rely solely on patient self-report, we remain doubtful. The best strategy may be a universal approach, treating all chronic pain patients considered for prescribed opioid trial as patients at risk for opioid misuse until proven otherwise

"Universal precautions" related to standardized pain management, not prevention of infection as is the more recognizable use of the term, is a treatment methodology deserving of our attention. Using this method, we approach all patients in pain who may require opioid therapy as patients at risk for opioid misuse By taking a thorough and respectful, yet strategic, precautionary approach to patient assessment and management in chronic pain treatment, stigma associated with opioid therapy can be reduced, patient care is improved, and overall risk contained [11,12]

Step One: Assessment

A comprehensive patient workup is considered the first step in pain management This includes[13]

- Age, sex
- History of present illness
- Pain assessment (type, intensity, frequency, and duration)
- Past medical and surgical history
- Past psychiatric history
- Substance abuse history, including records review, patient self-report, and dialogue with family or significant other
- Family and social (behavioral) history
- Medication profile, including all known allergies
- Physical examination
- Mental status assessment
- Review of diagnostic studies and assessments
- Evaluation of occupational risks related to pain and or therapy
- Confirmation of previous history of adequate opioid therapy trial
- Consideration of urine drug screen to confirm or deny presence of illegal drugs, unreported prescribed medication, or unreported alcohol use

The urine drug screen is a valuable tool used to help determine active or risk of drug abuse Requesting a broad range of assays provides a broad range of answers The urine may be tested for synthetic opioids, agonist or antagonist opioids, short-acting benzodiazepines and barbiturates, some over-the-counter (OTC) agents (eg, ephedrine, diphenhydramine, and phenylpropanolamine), alcohol, cocaine, and marijuana [10] The patient should be questioned regarding the use and/or misuse of other types of addictive substances such as nicotine use (eg, cigarette smoking), OTC drugs, and herbal preparations; and nutritional supplements, such as energy drinks and dietetic weight loss preparations [10]

There are three medications that are not scheduled (ie, do not require Drug Enforcement Agency (DEA) license to prescribe) yet deserve special mention Each is considered risky for addicted persons in recovery, and all are associated with de novo addiction

- Carisoprodol
- Butalbital
- Tramadol

Carisoprodol (Soma®) is a muscle relaxant which metabolizes to meprobamate, a tranquilizer similar to diazepam Butalbital is a short-acting barbiturate found in several headache preparations such as Fioricet® and Esgic® Tramadol (Ultram®, Ultracet®) is an atypical, synthetic, *mu*-receptor opioid agonist, of the morphine type, which acts centrally as an analgesic and is used for treating moderate-to-severe pain It appears to have actions on the GABAergic, noradrenergic, and serotonergic systems. Prescribing information for Ultram ER® (tramadol HCl) warns that tramadol "like other opioids used in analgesia, can be abused."[14]

Speaking with a family member or significant other also adds valuable information. Obtaining a perspective on the patient's history and behaviors from a person who shares a history with the patient provides another dimension to the evaluation [10] If patient or family dialogue reveals a history of abuse, or active addiction, a discussion surrounding the process of recovery must occur The patient may deny an addiction disorder, and further discovery, to limit risk and insure safe therapy, is warranted Some commonly used assessment tools to determine substance abuse or risk of abuse are the Screener and Opioid Assessment for Patients in Pain, or SOAPP®; the Opioid Risk Tool, or ORT; and CAGE

SOAPP, a survey tool used to predict opioid abuse, is available as a 5, 14, or 24-item questionnaire The major benefit in using one of the longer SOAPP forms is the increased sensitivity and specificity of the survey tool Table 1 demonstrates the differences among the three types of SOAPP tools [15]

Table 1[15]

SOAPP Version	SOAPP Cutoff Score	Sensitivity	Specificity	Positive Predictive Value	Negative Predictive Value	Positive Likelihood Ratio	Negative Likelihood Ratio
5Q Short Form	Score 4 or above	86	67	69	85	2.59	.20
14 & 24 Q Standard	Score 7 or above	91	69	71	90	2.94	.13

The ORT, a questionnaire, measures the following risk factors associated in scientific literature with substance abuse: personal and family history of substance abuse, age, history of preadolescent sexual abuse, and certain psychological diseases. Scores of 0-3 (low risk), 4-7 (moderate risk), or ≥ 8 (high risk), indicate the probability of opioid-related aberrant behaviors.[16]

CAGE is an easily administered screening instrument used primarily to determine alcohol abuse, although a revised version that adds drug use to the original questions, called CAGE-adapted to include drugs or AID, is used to alternately screen for both alcohol and drug abuse.[17,18] The CAGE *acronym* is based upon letters contained within the text of the four questions used, which include[17]:

1. Have you ever felt you should **cut** down on your drinking?
2. Have people **annoyed** you by criticizing your drinking?
3. Have you ever felt bad or **guilty** about your drinking?
4. Have you ever had a drink first thing in the morning to steady your nerves or get rid of a hangover (**eye-opener**)?

An answer of "yes" to one or more questions on the CAGE questionnaire indicates a need for further assessment. CAGF-AID includes an additional reference to drug use meant to target drug abuse. Two or more affirmative answers derived from the CAGE-AID questionnaire demonstrates high sensitivity and specificity for drug abuse and should result in further evaluation of the patient.[18]

During the physical examination, several signs may also point to alcohol abuse. The most obvious is the odor of alcohol on the breath of the patient at time of visit. Hepatomegaly, or enlarged liver, may present as a sign of cirrhosis, ascites, or excessive abdominal fluid, may indicate hepatic and/or pancreatic disease, hand tremors, or involuntary hand shaking, may indicate nerve disease secondary to alcoholism, and skin petechiae, or superficial blood vessels that have broken or ruptured, are also signs of alcohol abuse. Petechiae are frequently a result of microscopic vascular damage, secondary to cirrhosis of the liver. Rhinophyma, or hypertrophy of the nose, should not be considered a clear-cut sign of alcoholism as it is also related to the final stages of rosacea, a common centrofacial dermatosis with unknown etiology.[19-21]

Laboratory tests such as gamma-glutamyl transferase (GGT), mean corpuscular volume (MCV), and serum uric acid, may offer additional information related to alcohol abuse. The physical exam and lab test results, when used as sole predictors, offer low sensitivity and inconclusive results for confirming long-standing alcohol abuse.[10]

Assessment of comorbid conditions, which may often accompany pain and addiction, is also recommended. Depression, anxiety, sleep disorders, and psychiatric disorders (somatoform or personality) are all common comorbidities. To assess depression the Hamilton Rating Scale for Depression (HAM-D) or Beck Depression Inventory (BDI) are used most frequently, and are well studied and validated. Anxiety, which often accompanies depression, is assessed using the Hamilton Rating Scale for Anxiety (HAM-A). Sleep disorders which can contribute to increased pain and vice versa, especially in patients with fibromyalgia, can be assessed with polysomnographic testing.[22-26]

Each comorbid condition may be considered a unique disease entity, but all may be exacerbated by one another. Not identifying comorbid conditions may delay or prevent improvement in therapeutic pain management and contribute to pain worsening. Concomitant therapy using disease appropriate therapies may improve outcomes for one or more comorbid disease entities.[10]

The initial comprehensive assessment is time consuming and labor intensive. It is, however, a critical and essential first step in planning for safe and risk-reduced treatment management. The documentation resulting from the assessment will lay the groundwork for step two: strategic treatment agreement development, which is considered the blueprint of pain management.

Step Two: Patient-Centric Treatment Agreement

A treatment agreement is truly a dynamic blueprint for moving forward and details each parameter and goal of treatment, even as they shift and change. The treatment agreement serves many functions. It provides structure, expectations, consequences, and documentation. It begins by involving the patient in his or her own health care journey through informed consent, detailing roles and responsibilities. It states what is expected from the patient (and clinicians) through the course of treatment, and will identify therapeutic goals. It also highlights consequences of noncompliance, and establishes boundaries for referrals and exit strategies. When a detailed treatment agreement is well written and used dynamically, there is little room for surprise.[10]

The treatment agreement should be initialized as soon as possible after the intake assessment, and will become an evolving document based upon patient behaviors and treatment decisions. A living, breathing treatment agreement satisfies the requirement for due diligence, and is a benefit to the physician-practice.[10]

Step Three: Multidisciplinary Approach

A single physician treating a pain patient is vulnerable to interpretation of the regulatory and legal enforcement agencies. It is recommended that a multidisciplinary approach be adopted. Not only will the patient benefit from receiving specialized care, but the network of clinicians and health care providers receive support from one another and validate impressions and diagnoses while providing layered documentation. Multidisciplinary care is considered a "share-the-risk" model.[10]

Table 2 lists the specialists who may be included in the patient's care and may review and sign the treatment agreement.

Table 2. Multidisciplinary Specialists

- Pain specialist
- Addictionologist/addictions counselor, as applicable
- Pain therapist
- Psychiatrist specializing in addiction, as applicable
- Nurse
- Pharmacist
- Chiropractor
- Acupuncturist
- Physical medicine therapist
- Massage therapist
- Family/significant other, friends, support members
- Twelve-step sponsor, as applicable

Step Four: Formalize Treatment Agreement

After the treatment agreement has been drafted, the document should circulate for review and signature to all parties involved in the care of the patient, including the patient. This may be done using a hardcopy or an electronic file format. A formal meeting may be scheduled with all concerned, if feasible, and can be face-to-face or conducted via a telephone conference call, depending on practice location and clinician-patient availability. The primary objectives of the meeting are to agree on set treatment goals, define roles, and reassure the patient.

Figure 1 is a sample treatment agreement for a patient assessed as at risk for addictive disorder. The plan demonstrates the necessity of an accurate first-step assessment.

Sample Revised Opioid Treatment Agreement

Patient: Sue Ross **Physician:** Dr. Miller **Therapist:** Joan Small **Acupuncture:** Dr. Wong

This treatment plan is being revised in response to concerns on the part of the treatment team that a dependence on opioids may be developing. The primary purpose of the plan is to control the pain associated with my fibromyalgia while allowing for good function and preventing complications related to potentially dangerous medications.

Activities for Pain Management:

1. Take following prescribed medications daily
   - a. Methadone 50 mg three times daily (increased from 60 mg twice daily)
   - b. Ibuprofen 600 mg twice daily
   - c. Bupropion hydrochloride extended release 300 mg daily
   - d. Gabapentin 400 mg at 8 AM and 1 PM and 1,200 mg at bedtime (increased from 400 mg at 8 AM and 1 PM and 800 mg at bedtime)
   - e. Amitriptyline 50 mg at bedtime (added)
2. Keep a journal recording level of physical pain, emotional distress, connection with support system and spiritual well-being every morning and every evening, and any thoughts about taking extra medication
3. Stretching and relaxation exercises every AM and PM as prescribed
4. Read meditation literature and try to meditate once daily

Special Activities for Pain Management:

1. Acupuncture sessions three times weekly with Dr. Wong
2. Weekly Living with Pain group with Joan Small
3. Individual therapy session weekly with Joan Small
4. Medication management session every two weeks with Dr. Miller
5. Appointment for chemical dependency assessment with Dr. George Katz at New Hope Clinic on Tuesday, January 23 at 10 AM.

Response to Intensified Pain:

1. With significant increase in pain, apply ice pack and take oxycodone 5 mg
2. Move around and stretch to relieve muscle cramping
3. Contact Dr. Miller's service at 444-555-6666 if pain is not improved in one hour

Important Agreement Provisions:

1. All prescriptions are to be filled at CVS Pharmacy, 15 N. Main, 444-556-3456
2. No replacements will be provided for lost pills or prescriptions
3. Dr. Miller must prescribe all pain medications, and must approve of all prescribed medications *prior to you starting on them*
4. The Emergency Department of a hospital is not an appropriate place to seek help for an emergency related to your fibromyalgia. Contact the answering service for emergency assistance. If you should be taken to the Emergency Department for another reason, please request that the attending physician contact Dr. Miller prior to administering medications.

Sue Ross _____ Dr. Miller _____ Joan Small _____ Date _____

Step Five: Reassess, Review, Revise

The final step is as important as the first. We live in a dynamic world and nothing is static. This concept also applies to the treatment agreement. As treatment progresses, the patient must return for periodic reassessment. This step will help to determine if therapy is effective, if the patient is adhering to his or her responsibilities, and will provide opportunities to reassess behaviors. Scheduled urine drug testing is highly suggested. If results are negative for illegal drugs or other prescribed medications, this form of testing may be reduced or eliminated as therapy progresses unless behavior occurs that stimulates reinstatement. If the urine screen is negative for the medication being prescribed in the treatment agreement, such nonadherent behavior also requires careful reassessment and modification of the plan.

Aberrant behaviors, also known as behaviors of noncompliance, may not be evident upon first meeting the patient and may only surface after treatment begins. These behaviors may be interpreted as warning signs for addiction or drug diversion.

Table 3. Behaviors that may indicate addiction.[10]

Warning signs of developing addiction in pain patients
• Escalating tolerance in absence of objective signs of uncontrolled pain
• Requests for early refills
• Reports of lost or damaged prescriptions
• Reports of lost or stolen pills
• Visits to multiple doctors
• Visits to emergency departments
• Stealing drugs or prescription pads from doctor's office
• Stealing drugs from relatives', friends' medicine cabinets
• Calling in or forging prescriptions
• Buying controlled drugs over the Internet
• "Abuse" of illicit substances or alcohol

In the patient who may not have demonstrated risk of addiction, these behaviors may also manifest as a result of ineffective pain treatment. Pseudoaddiction is a term that defines aberrant behaviors in an undertreated patient. Chronic and undertreated pain drives patients to behave abnormally. It is theorized that tolerance to the prescribed opioid regimen may also result in hyperalgesia.[27] This condition may occur in patients who have been prescribed chronic opioid therapy, and this subpopulation of pain patients may also begin to exhibit aberrant behaviors driven by the pain and frustration of the newly perceived ineffectiveness of their long-prescribed, once effective drug regimen. If an established and relatively constant opioid plasma level changes abruptly, either by dosing changes on behalf of the patient or through direct orders of the physician, signs of physical dependence may also manifest as aberrant behaviors. Frequent reassessment and open discussion is essential to differentiate true addiction from pseudoaddiction, tolerance, or physical dependency.[23]

Certain patients may possess a catastrophizing mentality based upon experience, genetics, or behavior. These patients have learned, over time, to adapt to chronic adverse conditions. Adrenal glucocorticoids, which are normally secreted to offer protection (flight or fight) from stress producing adversities, are chronically secreted in this population. It is theorized that the constant allostatic load (the cost to the body of physiochemical adaption) will eventually cause plasticity of the brain's hippocampus. Experts in this area of study believe it is conceivable that damage of the hippocampus caused by morphological rearrangements will then alter certain memory functions and perceptions of chronic pain.[27,28]

It is known that stress exacerbates pain. Patients who possess high allostatic loads, especially addicts, who are fearful of experiencing pain without receiving adequate analgesia, begin

to obsess about the pain before it manifests, resulting in a physiochemical stress response that intensifies perceptions of pain to a level higher than would normally be expected. Effects from high allostatic loads will not only contribute to other conditions, such as behavioral inhibitions and sleep disorders, but are also considered a predilection to addictive disorder.[28,33] Recognition of contributory issues such as family adversity, adolescent psychiatric disorders, or adolescent drinking in chronic pain patients might not only be associated with, but causally related to, the risk of addiction. High allostatic load-chronic pain patients, once identified as patients at risk of addiction, are candidates for preventive interventions. It is critical to implement therapeutic strategies that contain risk for both patient and practice, address preventive measures for potential addiction, and provide adequate therapy and care for the patient's primary condition: chronic pain. It is important to note that the primary contributing factor to hyperalgesia remains unknown. Uncontrolled pain may be due to central sensitization and neuronal morphologic changes as a result of chronic opioid therapy or due to secondary effects from exposure to high allostatic load. Additional research is needed to determine accurate cause and effect mechanisms of hyperalgesia.

Proactive communications with not only the patient, but with family members, significant other, friends and/or employer will help provide a clearer picture of the patient's progress and/or challenges related to therapy. Informed consent and signed releases of information must be in place prior to making these contacts in order to protect the patient's right to privacy and confidentiality. Additional group health care provider meetings may also be periodically scheduled for the same reason. Updating documentation and reviewing new medical records is a great way to validate the network provider's navigation of care. Changes in therapeutic direction may be recommended and the original treatment agreement amended to reflect personalized patient care.[10]

Shining Light on the Shadow of Addiction

When there is a positive diagnosis of addictive disease in the chronic pain patient, the goal of therapy automatically changes to achieving maximal pain relief while protecting the patient against exacerbation or reactivation of addictive disease. The same strategic, patient-centric, stepwise approach, as previously outlined for therapeutic management, is instituted, but it is designed with greater precautions and layered with added boundaries. Novel pharmacotherapies may be prescribed on a trial basis to eliminate or minimize the use of prescribed opioids. Anticonvulsants (eg, gabapentin or lamotrigine) have been shown to be helpful in controlling neuropathic and musculoskeletal pain, and migraine-specific agents, such as triptans have also demonstrated positive analgesic effects on pain. Alternate and complementary therapies, such as advanced rehabilitative medicine, acupuncture, biofeedback, and hypnosis may also be introduced. The network of health care providers is an essential component, as specialized care for substance abuse is required.[10]

The treatment agreement will include more restrictions in the face of known addiction. If opioids are a necessary therapeutic agent, restrictions must be encoded in the plan to include:[10]

- Single prescriber or prescriptions written only by dedicated health care team assigned to patient, no doctor shopping
- Single, dedicated pharmacy for prescription fulfillment
- No visits to an emergency department without prior authorization
- Prescriptions written week-to-week, no refills
- No phone-in prescriptions
- Lost, stolen, damaged prescriptions or medications are not replaced
- Long-acting opioids are prescribed on a fixed dosage schedule
- Short acting opioids are prescribed for breakthrough pain
- Medications are secured (under lock and key) by someone other than the patient and must be dispensed per prescribed dosing schedule

The prescribing protocol, if opioids are essential to therapy, is restrictive. A single pharmacy for prescription fulfillment will be assigned. Again, proactive communication between prescribing physician and the lead pharmacist at the establishment is strongly suggested. The pharmacist becomes a secondary observer of the patient's behavior and is part of the care provider network. Single pharmacy prescription filling provides a true drug profile. Naturally, if the patient is doctor shopping, the patient may use multiple prescribers and pharmacies. Unfortunately, unless the state where the medical practice is located has initiated a prescription monitoring program (PMP), a database of registered controlled substance prescribers and their writing activities, these types of aberrant patient behaviors may not be easily identified. In fact, the only states to report a decrease in substance misuse activity are the states that currently have PMPs in place: Kentucky, Ohio, Michigan, Nevada, and Utah.[34] Financial gain, derived from misappropriation and diversion of prescribed opioids, is the primary reason for patients without prior history of substance abuse to begin selling their drugs illegally.[10]

Signature of the treatment agreement will become the decisive moment of truth for the addicted patient. Until that point in time the patient may have been cooperative and friendly. When asked to sign the treatment agreement, the patient may become agitated and abusive, may abruptly refuse to sign, and refuse further treatment. **Figure 2** demonstrates the severely restrictive nature of a treatment agreement designed for a patient with active addiction. Behavior modification, in terms of addiction counseling and formal substance-abuse treatment, will then be necessary before attempting any further opioid pain treatment goal setting with this patient type.[10]

Sample Pain Treatment Agreement

Patient: Irene Simpson **Doctor:** Dr Miller, MD **Date:** 1-19-07

This treatment plan has been developed to manage neck pain and tension headaches. It is open to changes when both the doctor and I agree that the changes are in my best interest and are likely to improve my pain management or other overall health. A primary goal of the plan is to protect my recovery from the disease of addiction.

1. My daily medications: gabapentin 1,200 mg three times daily
   duloxetine 90 mg every morning
   topiramate 100 mg at bedtime
2. At the first indication of a headache, I will take
   ibuprofen 600 mg
3. If possible, I will lie down in a darkened room with an ice pack to my neck and shoulders for 15-20 minutes to give the medication time to work. If the headache is still present in 30 minutes, I will take acetaminophen 500 mg. Use of opioid medications can be considered if this plan is not successful. However, under no circumstances will I seek these medications from other doctors, friends or the Internet. Instead, I will discuss my cravings and sense that the plan is not working with Dr. Miller, Joan Small and my sponsor.
4. I will see Dr. Wong weekly or as recommended for acupuncture.
5. I will walk 15-30 minutes daily.
6. I will attend the pain management group with Joan Small weekly and see Joan for individual sessions as indicated.
7. I will obtain all prescriptions for headache or other pain, and for addiction recovery, from Dr. Miller, and I will fill all prescriptions at the CVS pharmacy on Main Street.

Continued next page

Sample Pain Treatment Agreement (continued)

8 I will not visit other physicians or the Emergency Department without first talking to Dr Miller or to the doctor who is covering for him.

9 I will attend my home group, Tuesday Night Women's Group, weekly, plus two other weekly AA meetings of my choice, I will talk with my sponsor at least once weekly and will call her when I feel despondent or have cravings to drink or take opioid pills

10 My daily meditation will focus on removing myself from conflicts where I do not have a direct role to play I will try to remind myself when "I don't have a horse in this race" at work, or at home

Important Phone Numbers

Dr Miller's Office	222-3800
Dr Miller's Answering Service	222-9000
CVS Pharmacy	380-2000
Joan Small's Office	380-2132
AA Hotline	234-0081
Abby (sponsor)	382-9970

Patient _____ Doctor _____ Date _____

This agreement is a plan for managing neck pain and headaches in a recovering alcoholic with a history of abusing pain medications prior to entering the pain management clinic In most cases, this combination of medications and alternative therapies will allow good pain control and improved function while strengthening the patient's recovery program and preventing relapse It does, however, reassure the patient that opioids will be considered if her pain is not controlled with this approach

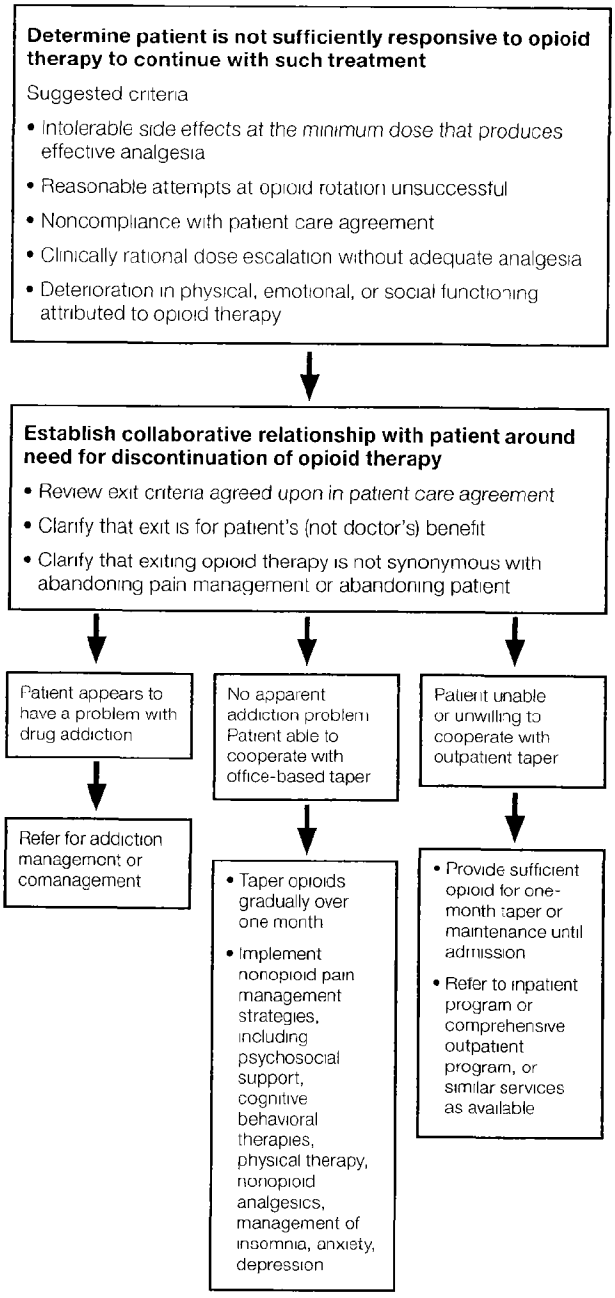
During the course of the patient's treatment, when aberrant behaviors are identified and/or they continue in spite of restrictive protocols, the patient must be confronted and the treatment agreement with its expectations and consequences reviewed by all parties involved. It is recommended that at least two health care providers speak to the patient together, one can lead the discussion, while the other documents details of the conversation. This communication model discourages anecdotal reporting from either patient or physician [10]

If the patient is not already under the care of an addictionologist, a referral to an addiction counselor or addiction treatment provider is initiated If previous referrals have been made and behaviors are not conducive to treatment, care may be terminated, with a caveat for a clearly documented plan for medical withdrawal. If care is terminated due to known criminal activity on the part of the patient, the criminal activity must be reported as soon as possible by the clinician to the local law enforcement agencies and the patient informed of this action. It is important the health care team reassure the patient, clarify that the decision of treatment discontinuation is in the patient's best interest, and reinforce that the health care team is not abandoning the patient It is best that an exit strategy be considered at onset of treatment while designing the treatment agreement, and not during the emergent crisis of treatment termination. As with all other steps of the treatment agreement, the exit strategy resulting in termination of care must be fully documented.[10,35,36]

Figure 3. Suggested exit strategy algorithm.

Exit Strategy Guide for Discontinuation of Opioid Therapy

The possibility of subsequent discontinuation from opioid therapy should be discussed with the patient at the time that opioid therapy is initiated



It is essential that the prescribing clinician provide sufficient prescription to the patient for a one-month taper or maintenance treatment once the patient is promised admission to a new treatment program. A sincere attempt should be made by the prescriber to tide the patient over with analgesia until new treatment can begin, and not abandon the patient to acute drug withdrawal.[1,36]

Summary

All chronic pain patients reserve the right to be treated with dignity and respect, and to receive adequate analgesia. Comprehensive patient assessment is a key component in the design and development of a strategic treatment agreement that offers promise of a high rate of success. In spite of many challenges, both chronic pain patients at high risk of addictive disorder and active addicts can be treated successfully. Using a strategic, precautionary, multidisciplinary, and stepwise therapeutic agreement is considered best practice. By scheduling frequent patient visits through a network of multidisciplinary providers, treatment can be discussed and patient behaviors observed. These frequent updates will help identify aberrant behaviors early in the program, optimize treatment, and contain risk. The value of accurate and frequent documentation provided by diagnostic results, urine drug screens, reported observations, or patient office visit notes cannot be underestimated. As knowledge of chronic pain and addiction continues to evolve, options for increased treatment performance will improve.

References

1 Curtiss C, Stegman M. Preparing for JCAHO: Implications for the Case Manager. *Care Manag J*. Special Issue. November 2000. 4-10.
2 Max MB, Payne R, eds. *Principles of analgesic use in the treatment of acute pain and cancer pain*. 4th ed. Glenview, IL: American Pain Society; 1999.
3 AGS Panel on Chronic Pain in Older Persons. The management of persistent pain in older persons. *J Am Geriatr Soc*. 2002;50:S205-S224.
4 Joranson DE, Gilson AM, Dahl JL, Haddox JD. Pain management, controlled substances, and state medical board policy: a decade of change. *J Pain Symptom Manage*. 2002;23:138-147.
5 National Guidelines Clearinghouse. Assessment and Management of Chronic Pain. 2005. Accessed January 11, 2007, online at *http://www.guideline.gov/summary/summary.aspx?doc_id=8363*.
6 National Guidelines Clearinghouse. VA/DoD Clinical practice guideline for the management of opioid therapy for chronic pain. 2003. Accessed January 11, 2007, online at *http://www.guideline.gov/summary/summary.aspx?doc_id=4812&nbr=003474&string=chronic+AND+pain*.
7 Phillips D. JCAHO Pain Management Standards are Unveiled. *JAMA*. 2000;284:428-429.
8 Substance Abuse and Mental Health Services Administration, Office of Applied Studies. *Results from the 2005 National Survey on Drug Use and Health: National Findings*. DHHS Pub. No. SMA 05-4062, at 232 (Sept. 8, 2005).
9 The National Center on Addiction and Substance Abuse. Under the Counter: the diversion and abuse of controlled prescription drugs in the U.S. 2005. Accessed January 11, 2007, online at *http://www.casacolumbia.org/absolutenm/articlefiles/380-under_the_counter_-_diversion.pdf*.
10 Ziegler PP. Addiction and the Treatment of Pain. *Subst Use Misuse*. 2005;40:1945-1954.
11 Gourlay D, Heit H. Universal precautions: a matter of mutual trust and responsibility. *Pain Med*. 2006;7:210-211.
12 Gourlay D, Heit H, Almahrezi A. Universal Precautions in Pain Medicine: A Rational Approach to the Treatment of Chronic Pain. *Pain Med*. 2005;6:107-112.
13 National Guidelines Clearinghouse. Opioid guidelines in the management of chronic non-cancer pain. 2006. Accessed January 16, 2007, online at *http://www.guideline.gov/summary/summary.aspx?ss=15&doc_id=8806&nbr=4853*.
14 Ultram ER® Prescribing Information. 2006. PriCara™, a unit of Ortho-McNeil, Inc., Raritan, NJ 08869. Accessed January 16, 2007, online at *http://www.ortho-mcneil.com/active/janus/en_US/assets/common/company/pi/ultramer.pdf#zoom=100*.
15 The Screener and Opioid Assessment for Patients in Pain (SOAPP®). Accessed January 11, 2007, online at *http://www.painedu.org/soap-tutorial_02.asp*.
16 Webster LR, Webster RM. Predicting aberrant behaviors in opioid treated patients: preliminary validation of the opioid risk tool. *Pain Med*. 2005;6:432-442.
17 Mayfield D, McLeod G, Hall P. The CAGE questionnaire: validation of a new alcoholism screening instrument. *Am J Psychiatry*. 1974;131:1121-1123.
18 Maruish E. *Psychological Testing in the Age of Managed Behavioral Healthcare*. 2002. Lawrence Erlbaum Associates: Mahwah, NJ.
19 Kao AC. American Medical Association Clinical Pearl: Diagnosing Alcohol Abuse and Treating Withdrawal Syndrome. 2003, Volume 5, Number 3. Accessed January 11, 2007, online at *http://www.ama-assn.org/ama/pub/category/9774.html*.
20 Lehmann P. Rosacea: Clinical features, pathogenesis and therapy. *Hautarzt*. 2005;56:871-885, quiz 886-887.
21 Buechner SA. Rosacea: an update. *Dermatology*. 2005;210:100-108.
22 American Psychiatric Association. *Diagnostic and Statistical Manual of Mental Disorders*. Fourth Edition. Washington DC, American Psychiatric Association, 1994. DSM-IV: HAM-D.
23 American Medical Association, AMA. *Pain Management: Part 3: Management of Persistent Nonmalignant Pain*. 2003. Accessed January 17, 2007, online at *http://www.ama-cmeonline.com/pain_mgmt/module07/pdf/pain_mgmt_03.pdf*.
24 American Psychiatric Association. *Diagnostic and Statistical Manual of Mental Disorders*. Fourth Edition. Washington DC, American Psychiatric Association, 1994. DSM-IV: HAM-A.
25 Littner M, Hirshkowitz M, Kramer M, et al. Practice parameters for using polysomnography to evaluate insomnia: an update. *Sleep*. 2003;26:754-760.
26 Culpepper L. Secondary insomnia in the primary care setting: review of diagnosis, treatment, and management. *Curr Med Res Opin*. 2006;22:1257-1268.
27 Chu, LF, Clark DJ, Angst MS. Opioid tolerance and hyperalgesia in chronic pain patients after one month of oral morphine therapy: a preliminary prospective study. *J Pain*. 2006;1:43-48.
28 McEwen B. Plasticity of the Hippocampus: Adaptation to Chronic Stress and Allostatic Load. *Ann NY Acad Sci*. 2001;933:265-277.
29 McEwen B, Seeman T. Allostatic Load Working Group, University of California San Francisco, John D. and Catherine T. MacArthur Research Network on Socioeconomic Status and Health. Allostatic Load and Allostasis: Summary. 1999. Accessed January 12, 2007 online at *http://www.macses.ucsf.edu/Research/Allostatic/notebook/allostatic.html*.
30 Koob G, Le Moal M. Drug Addiction, Dysregulation of Reward, and Allostasis. *Neuropsychopharmacology*. 2001;24:97-129.
31 Bremner JD, Randall P, Scott TM, Bronen RA, Seibyl JP, et al. MRI-based measurement of hippocampal volume in patients with combat-related posttraumatic stress disorder. *Am J Psychiatry*. 1995;152:973-981.
32 Ruehle BS, Handwerker HO, Lennerz JK, Ringler R, Forster C. Brain activation during input from mechanoinsensitive versus polymodal C-nociceptors. *J Neurosci*. 2006;26:5492-5498.
33 McEwen BS. Sleep deprivation as a neurobiologic and physiologic stressor: Allostasis and allostatic load. *Metabolism*. 2006;55(10 Suppl 2):S20-23.
34 National Drug Intelligence Center. *National Drug Threat Assessment 2007*. October 2006.
35 Cohen SP, Raja SN. The middle way: a practical approach to prescribing opioids for chronic pain. *Nat Clin Pract Neurol*. 2006;2:580-581.
36 Exit Strategy Guide for Discontinuation of Opioid Therapy. Accessed January 12, 2007, online at *http://www.painknowledge.org/physiciantools/opioid_toolkit/components/Exit_Strategy.pdf*.

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Please rate the activity by filling in the most appropriate circle.

(A) Excellent (B) Good (C) Fair (D) Poor

	A	B	C	D
1 Overall content	○	○	○	○
2 Format	○	○	○	○
How well did this activity achieve its educational objectives?				
3. Differentiate the five steps of chronic pain management	○	○	○	○
4 Describe three aberrant behaviors attributed to chronic pain patients with addictive disease	○	○	○	○
5 Identify three benefits that are derived from using a strategic precautionary approach to patient assessment and management for the chronic pain patient	○	○	○	○
6 Illustrate at least one activity related to deployment of an exit strategy	○	○	○	○

	Yes	No
7 Do you feel the activity was useful to you in your practice setting?	○	○
8 Do you feel that fair balance was maintained for all therapeutic options?	○	○
9 Would you participate in future self-study activities?	○	○

10 How long did it take you to complete this activity?
☐ 50-60 minutes ☐ 61-70 minutes ☐ Over 70 minutes

Please provide detailed comments and suggestions for future activities.

_____

_____

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Self-Assessment Questions

1 The five steps of a comprehensive and strategic approach to pain management in correct order of progression are
Conduct assessment, draft patient-centric treatment agreement, use multidisciplinary approach; formalize treatment agreement, reassess, review and revise treatment agreement
○ a. True ○ b False

2 Which of the following is not considered an aberrant behavior?
○ a. Drug-seeking behavior ○ c Reporting a lost prescription
○ b. Prescription forgery ○ d Reporting an adverse event

3 Which of the following is considered a drug that is not scheduled, but should be treated as a scheduled medication when dealing with chronic pain patients?
○ a Carisoprodol ○ c Paliperidone
○ b Topiramate ○ d. Sertraline

4 Which one is not considered a clear-cut sign of alcoholism?
○ a Alcohol on patient's breath ○ c Involuntary hand shaking
○ b Hepatomegaly ○ d. Rhinophyma

5 Anxiety and depression are considered two common comorbidities related to chronic pain
○ a True ○ b. False

6 Which of the following survey tools is not used to determine substance abuse or risk of abuse?
○ a SOAPP ○ c. HAM-A
○ b CAGE ○ d ORT

7 The treatment agreement should include all but the following
○ a Treatment goals
○ b Consequences of treatment noncompliance
○ c Potential exit strategies
○ d Insurance information

8. A multidisciplinary care model is considered a "share-the-risk" model of care
○ a True ○ b False

9 Frequently scheduled follow-up visits help achieve the following
○ a Validate effective treatment
○ b Confirm patient adherence to plan
○ c Observe and assess patient behaviors
○ d All of the above

10. Pseudoaddiction is the demonstration of aberrant behaviors in response to inadequate pain treatment
○ a True ○ b False

I certify that I have completed this educational activity as designed Signature _____ Date _____

esp™ Emerging Solutions in Pain

CE-Accredited Monograph

Patient and Clinician: Mutual Shareholders in the Treatment of Chronic Pain

April Vallerand, PhD, RN, FAAN

"You treat a disease, you win-you lose. You treat a person; I'll guarantee you'll win."

Hunter "Patch" Adams (Robin Williams)
Patch Adams (1998)

Activity Release Date: August 1, 2007

Period of Validity: August 1, 2010

PROGRAM OVERVIEW

Optimal management of chronic pain requires the use of clear communication skills on the part of both patient and clinician. The standard or traditional model of health care communications is biogenic, also called disease centered, with the clinician as primary decision maker. Emerging research has demonstrated that management of chronic pain can be improved through integration of a patient-centered, self-management model of communications and care, placing the patient, not the disease or clinician, at center of communications, care, decision making and treatment. The primary objective of this monograph is to increase awareness surrounding the improved model of patient-clinician communications related to effective pain control and to discuss applications of strategies used to promote optimal communication between patients, health care providers, family members/caregivers and patient advocates.

TARGET AUDIENCE

This activity is designed for physicians, pharmacists, physician assistants, and nurses who have an interest in enhancing their knowledge and understanding of pain management.

LEARNING OBJECTIVES

Upon completion of this activity, participants should be able to:

1. Compare and contrast the disease-centered model of care with the patient-centered model of care
2. Describe three educational resources that may be recommended to patients to assist with the process of their informed consent
3. Compare and contrast the traditional model of decision making with the model of shared decision making
4. Identify the five descriptors related to the SMART tool used in patient goal setting
5. Cite two examples of therapeutic and economic benefits related to patient self-management

GENERAL INFORMATION

This activity is eligible for credit through August 1, 2010. After this date, this activity will expire and no further credit will be awarded.

There are no fees for participating in this activity. All participants must complete the Activity Evaluation Form. Participants must receive a minimum score of 70% on the self-assessment portion of the form to qualify for CPE credit. Certificates may be printed immediately after completing the online self-assessment and evaluation.

This activity is supported by an independent educational grant from

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FACULTY BIOGRAPHY

Dr. April Hazard Vallerand received her bachelor's degree in nursing from Mount St. Mary's College in Los Angeles, and her master of science degree in nursing from California State University, Los Angeles. She received her doctorate degree in nursing from the University of Pennsylvania, in Philadelphia, and completed a three-year postdoctoral fellowship in psychosocial oncology at the University of Pennsylvania, School of Nursing. Dr. Vallerand is currently an associate professor at the College of Nursing, Wayne State University in Detroit, Michigan and a fellow in the American Academy of Nursing. Her research includes improvement and maintenance of functional status in, and prevention of disparities in care of chronic pain patients. She was a panel member of the American Pain Society for the development of Guidelines for the Management of Pain in Osteoarthritis, Rheumatoid Arthritis, and Juvenile Chronic Arthritis and the American Geriatric Society for the development of guidelines for the Management of Persistent Pain in Older Persons. Dr. Vallerand lectures nationally and has published numerous articles on pain and pain management.

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Introduction

Chronic pain, like any other chronic, progressive condition or disease state, presents therapeutic management challenges Under best-case conditions in routine practice, more than 40%-50% of chronic pain patients fail to achieve adequate pain relief [1] Chronic pain affects more than just the physical body Multiple domains are impacted, including physical, psychological, social, spiritual, and emotional Unremitting pain is also associated with anxiety, depression, loss of independence, and interference with interpersonal relationships Health care-related quality of life is negatively affected which often impacts functionality, including the ability to work and participate in pleasurable recreation [1]

Pain, itself, is a subjective experience, influenced by a host of factors, including age, gender, race, culture, environment, and genetics These factors are important in understanding pain, treatment options, and patient response to therapy These factors, however, are often beyond the control of clinician and patient Additionally, multiple barriers exist in regard to effective pain treatment, and include the following categories health care systems, regulatory and legal environment, clinician, and patient [1]

Health Care System Barriers

With the advent of managed care, the model of medical care as was known for many decades ceased to be, and the replacement model which was introduced is in constant flux, changing sometimes within weeks or even days Insurance companies now dictate parameters surrounding patient treatment to clinicians Insurers and managed care organizations are reluctant to approve coverage for some forms of pain therapy and variations in plan coverage are often evident related to treatment of chronic pain [2] Reimbursement schedules impact time allotment related to patient visits Today, family practice clinicians handle multiple health topic inquiries from their patients One study reported that the health topic that received the most talk time was discussed for 5 3 minutes on average, with remaining issues typically receiving approximately one minute each [3,4] An average office visit under these temporal circumstances is hardly adequate to properly assess and communicate fully with the patient, especially one who is suffering with chronic pain. Co-payments, out-of-pocket expenses, limits on number of prescriptions written and number of refills allowed, these are just some of the many dynamic health care system factors affecting quality of health care in the United States today [1]

Regulatory and Legal Barriers

Fear of regulatory scrutiny is a major concern among clinicians who prescribe opioids, often resulting in the selection of less-effective analgesics which frequently leads to undertreatment of the patient's pain.[1] Patients also are impacted by the environment of fear Fear and misunderstanding related to opioid addiction and tolerance often surface as barriers to care and may be attributed to misconceptions about opioid terminology; exemplified by words like "addiction, physical dependency" and "tolerance." Each of these words mean entirely different things in popular and medical parlance.[5]

The stigma associated with opioid use, albeit for medicinal purposes, may prevent patients from fully disclosing the frequency and severity of their pain Many patients prefer to suffer with the pain than to be known as an opioid user This is especially true in patients prescribed methadone for chronic pain treatment [6] The current legal and regulatory environment casts suspicion and supports the stigmatization of patients who require opioids to control pain

Clinician and Patient Barriers

Gaps in knowledge surrounding pain, negative attitudes related to opioid prescribing, inadequate assessment skills, reluctance to prescribe appropriate and adequate opioid analgesia for chronic pain patients, time restraints and compromised communication all create barriers to effective pain management for the clinician [1]

Communication, psychological and attitudinal issues are all considered patient-related barriers In a recently published formal systematic review of the literature, it was reported that both chronic pain patients and practitioners wanted clear communication regarding the following themes (1) beliefs about pain, (2) expectations of treatment, (3) trust, and (4) patient education, all within the consultation Both patient and practitioner wanted to be respected, but conflicts existed on nearly all other aspects of the consultation, some of which at present may seem insurmountable and may lead to difficulties in achieving positive outcomes [7] Patients who experienced poor communication with their clinician have reported significantly worse pain than those patients who did not [1]

Psychological barriers include common comorbidities of chronic pain anxiety, depression, distress, anger, and dementia These secondary conditions can mask or exacerbate symptoms of chronic pain, complicating an accurate assessment [1] Fatalism and a desire to please the clinician have also been reported as barriers to pain Some patients expressed the belief that pain was inevitable and indicated that they did not expect the analgesic to be effective Patients also associated worsening pain with worsening disease, resulting in reluctance in accurate pain reporting [1] A compromised ability or conscious effort on the part of the patient to not actively communicate with his/her clinician, and vice versa, is considered a primary barrier to effective care

Many of these collective barriers are also beyond the control of the clinician and patient One of the most critical factors and one that is within the control of both patient and clinician is their recognition of ability, style, and method of shared communication Communication, for both patient and clinician, is at the center of best-practice models of care, informed patient consent, patient education, shared decision making, and patient advocacy Options for improved communications between patient and clinician are the focus of this paper, as both parties are equally responsible for how their independent and collective communications affect outcomes

Medical Meanings

Addiction–Addiction is a primary, chronic, neurobiologic disease that is influenced by genetic, psychosocial and environmental factors It is characterized by one or more of the following impaired control over drug use, compulsive use, continued use despite harm and craving

Physical dependency–Physical dependence is an expected state of adaptation typical of a particular class of medication It can result in withdrawal syndromes if there are abrupt decreases in the patient's medications Physical dependence is different from addiction

Tolerance–Tolerance is a state of adaptation in which exposure to a medication results in changes that decrease one or more of the drug's effects over time. Being tolerant to a medication is not addiction

Reference *www cephalon com/newsroom/assets/Breakthrough_Pain_Glossary doc*, Accessed on June 18, 2007

Patient-Centered Model of Care: Clinician's Perspective

The traditional model of medical care is evolving from a biocentric or disease centered model to one that is patient centered. Prior to the last two decades, the health care relationship was predominantly between a patient seeking help and a physician whose decisions were silently accepted, without question, by the patient. Within this paternalistic framework, the practitioner selectively uses his/her skills to choose what he or she believed to be the necessary interventions or treatments most likely needed to restore the patient's health or reduce pain. The information provided to the patient would be custom tailored to encourage patient consent to the practitioner's preselected decision.[8] At present, the best-practice model of care is one that places the patient at the center of his/her own health care journey, commonly referred to as patient-centered care. The patient-centered approach has been described as one in which "the clinician tries to enter the patient's world, to see the illness through the patient's eyes."[8]

Although many clinicians may insist that they embrace the patient-centered model of care, it has been reported by Lin, et al that observation of practicing clinicians, residents, and medical students demonstrates that most use a dominant mode of inquiry when talking with their patients.[10] This form of inquiry avoids open-ended questioning or patient-centered interview. Some suspected reasons for this closed approach may be fear on the part of the clinician to appear lacking in knowledge, or he/she may be afraid of losing control of the situation. An empathetic patient-centric care model, however, is not supported by use of closed questioning.[9,10]

Lin and colleagues at the University of Colorado Medical School have found an expeditious and effective method to train and encourage interview style, open-ended questioning meant to support patient-centric care. The method consists of three techniques: inviting, listening, and summarizing. Medical students at the University have been using this method for several years as part of their assigned curriculum, and have found the three techniques easy to apply.[10]

Invite

An invitation leads to a descriptive story, not just a simple "yes" or "no" answer. Most observed clinicians do include one open-ended question but then regress to closed inquiry. Successful implementation of the invitation is to continue with open discussion until no further usable data is provided by the patient.[9,10]

Listen

Listening is easy: simply stop talking. Talking interrupts active listening. Not talking, however, should not be confused with active listening. An example of this is the "listener" using the silence to develop a reply. By implementing the first method, invitation, a clinician is free from worrying about what his/her own reply will be and actively concentrate on the patient's concerns. Listening is also related to observing. It is important to listen and observe, as much will be communicated by the patient in nonverbal cues, especially in the context of chronic pain.[9,10]

Summarize

By summarizing what the patient has communicated, the practitioner must listen and get it right. When the patient hears validation from the clinician on what was just expressed, the patient feels heard and understood, and believes that the clinician really does care, thus fulfilling the role of empathetic care and fostering a relationship.[9,10]

Naturally, specific and pointed "yes" or "no" questions will need to be asked of the patient, but they will be asked intermittently throughout or at the end of the discussion within a context of a comprehensive history. The invite, listen, summarize method does represent a deviation from "natural" conversation, but a medical interview is not a natural conversation for the following reasons: 1) in a medical conversation, the clinician and patient are usually strangers, or at very least, not best friends, 2) medical conversations contain critical data that must be communicated and understood correctly, 3) medical conversations are emotionally charged, empathetic discussion is essential, not a luxury.

When the patient and physician have been in a medical relationship for years, the personal bond can either accentuate the positive as the clinician will provide extra attention or alternately, it may blind the clinician to the patient's real problem. This blinding often occurs when the medical interview includes too much personal "catching-up" and not enough medical investigation. Either way, in light of these three differentiating factors, and the unpredictable nature of the patient-clinician relationship, the invite, listen, summarize method leads to improved information gathering and improved patient-clinician rapport for either the new or seasoned patient-clinician relationship.[9,10]

Special consideration must be taken in recognition of barriers to patient-clinician communication. (Figure 1) When confronted with these circumstances, alternate methods of communications must be enlisted, such as family or caregiver discussion, observation of nonverbal cues, interview with assistance of translator or assistant of corresponding patient gender, electronic communication, or other creative communication methodologies.[11] This type of open-ended questioning may help not only to guide treatment decisions, but to also disclose patient behaviors associated with a high risk of abuse, misuse, and addiction associated with opioid analgesic pharmacotherapy.

Figure 1. Barriers to Patient-Clinician Communications Checklist[11]

Checklist

- ☐ Speech ability or language articulation
- ☐ Foreign language spoken
- ☐ Dysphonia
- ☐ Time constraints on physician or patient
- ☐ Unavailability of physician or patient to meet face-to-face
- ☐ Illness
- ☐ Altered mental state
- ☐ Medication effects
- ☐ Cerebral-vascular event
- ☐ Psychologic or emotional distress
- ☐ Gender differences
- ☐ Racial or cultural differences
- ☐ Other

It is important to know and incorporate improved methods of communication and it is equally important to know what to avoid. Figure 2, demonstrates six communication traps to avoid.

Figure 2. Communication Traps to Avoid[11]

Checklist

- ☐ Using highly technical language or jargon when communicating with the patient
- ☐ Not showing appropriate concern for problems voiced by the patient
- ☐ Not pausing to listen to the patient
- ☐ Not verifying that the patient has understood the information presented
- ☐ Using an impersonal approach or displaying any degree of apathy in communications
- ☐ Not becoming sufficiently available to the patient

Figure 1 and 2 printed from JAOA-*The Journal of the American Osteopathic Association* ©2005 American Osteopathic Association. Reprinted with consent.

To truly adopt patient-centered care communications, clinicians need to ask themselves what their own personal, moral, and ethical reasons are, for, or against, open communication with their patients [12] Some physicians have had first-hand experience, as they unexpectedly found themselves in the role of patient, as demonstrated in a 2006 published report of an interview study, conducted by Klitzman at Columbia University Medical Center in New York City, of 50 physicians who had become patients As patients, physicians saw areas of care that needed improved communications, some of which were acknowledging having kept patients waiting, increasing awareness of nonverbal cues, more direct communication related to taboo topics, and increasing sensitivity related to the delivery of bad news, adherence, and nonmedical issues This group of physicians reported increased sensitivity to patient's experiences and empathy in the physician-patient relationship when they returned to care for patients in their own medical practice [13] In the chronic pain environment, mindfulness on the part of the clinician that includes empathy towards another human being helps the clinician become aware of the patient's subjective response to pain, invokes compassion in relationship to the patient's suffering, and helps to dissolve the fears and stigmatization of both clinician and patient often associated with opioid analgesic prescribing and medical use This new, mindful alliance between clinician and patient based on cooperation rather than confrontation, in which the clinician must "understand the patient as a unique human being"[8] segues nicely to next-steps of patient education and informed consent, shared decision making, and medical, therapeutic and personal goal setting, coupled with patient self-management

Informed Consent, Patient Education, and Shared Decision Making

The United States is held to be the originator of informed consent, with an initial aim to ensure patient dignity and independence at the time of decision making and review of medical treatment options [14,15] Reports on this topic first appeared in America during the 18th Century, mentioning only the simple rights of the patient giving his/her approval of the health intervention, with no mention of preemptive information or education In the 21st Century, informed consent assumes patient education has been provided to reach not only consent, but consensus Information and consent may be compared to the opposite sides of the same coin [14,15] Prior to obtaining informed consent, the practitioner must provide the patient with information for them to make, not only an informed decision, but an educated decision This process supports the patient-centered model of care by providing empowerment and control to the patient related to health care decisions Informed consent through patient education also provides the basis of discussion surrounding risk versus benefit of treatment or intervention This is an important point, especially in regard to chronic pain. Clinicians need to educate their patients about chronic pain and available treatments, especially in regard to controlled analgesic medications, such as opioids The patient must be informed that the prescribing clinician will abide by all state and federal regulations surrounding the prescribing of controlled substances The patient needs to agree to be responsible for the medications prescribed, and to understand that these medications have the potential for misuse, abuse and addiction and to know that the controlled drugs and activities surrounding their use are closely monitored by the regulatory and legal agencies Patients must hear and understand that no analgesic currently exists that will take away more than 30% of the pain they experience Armed with this information, patients will relax their expectations regarding pharmacotherapy and gain a realistic view of treatment outcomes [16] As previously mentioned, risks involved with certain medications, whether they are side effects or risks of abuse and misuse, must be discussed with the patient prior to treatment onset, just as proper patient assessment and screening must be conducted by the clinician before prescribing treatment Information obtained through this discussion and additional assessment will assist practitioners in identifying patients who may require coincident or antecedent counseling or treatment [16]

Patient education increases safety by reducing possible medication error It increases patient compliance and satisfaction with the clinician regarding treatment outcomes Educational tools need to increase patient awareness about their disease or condition and provide common ground for further discussion Unfortunately patient education is often provided to patients with little regard for their ability to read and interpret the information presented Many patients possess a reading comprehension level equivalent to 6th grade and frequently patient educational tools are written at a level requiring reading comprehension of at least an 11th grade level [17-19] This obvious disconnect is especially important as those with poor health literacy are more likely to have a chronic disease and less likely to get adequate treatment [19] Patients who lack literacy will rarely reveal their lack of comprehension In a study published in 1996, two-thirds of 58 patients who admitted having reading difficulties never told their spouse Nine of them had told no one [19] For clinicians to believe that their patients will confess to illiteracy is a misguided notion A quick health literacy screening exercise, however, will help determine if the patient can read, retain, and understand the information provided

Diversity of language may also present a challenge when trying to educate the patient Due to the increase in the United States of foreign and/or immigrant populations, language becomes an ever growing barrier to the patient-clinician relationship Not everyone reads, understands, or is physically able to hear spoken English It is imperative to immediately assess the language capabilities or preferences of the patient and obtain and utilize appropriately translated patient education materials Oral and multimedia visual educational tools help the patient absorb information, resulting in increased learning [19] Braille or a signing translator may be needed to assist in increasing patient understanding for the visual and hearing-impaired patient population. It is clearly the responsibility of the health care provider to insure that the patient demonstrates understanding of the educational information provided to them.[19]

When communicating with patients, use the "summarize" method to confirm comprehension by the patient The patient will be summarizing and his/her summary will help the clinician determine if the patient understands the information just provided A simple *"Can you tell me in your own words what we have just discussed?"* will be enough to know if the patient truly understands In addition to summarizing or "teaching back," Figure 3 shows other ways to create a "shame-free" learning environment for patients with low health literacy

Figure 3[19]
Tips for a Shame-free Learning Environment

- Include a "summarize" or "teach-back" method to ensure patient's level of comprehension.
- Provide surrogate readers, suggest the patient bring a friend or family member
- Prior to an appointment, tell the patient what information will be needed (eg, list of current medications, insurance documents, and reason for the visit)
- Tailor medication schedules to fit the patient's daily routine, color code medications, and couple medication administration with activities or events of daily living to increase compliance

Alternately, it is also important not to underestimate a patient's desire for knowledge and ability to comprehend For example, if the patient has an advanced degree in neuroscience, the practitioner should provide the patient with a higher level of learning materials One type or level of tool will not answer the needs of all patients

The following chronic pain management topics usually require patient education materials in multimedia format Educational tools in multiple languages help patients become informed partners in decision making, aid in compliance, and help to increase

satisfaction with care and therapeutic outcomes

- Pain assessment
- Available therapies (eg, pharmacologic, alternate, interventional, and surgical)
- Risks and benefits associated with therapy
- Treatment agreements (eg, for goal setting, consequences of failed treatment, and exit strategy)
- Side effect recognition and management options
- Monitoring and maintenance of care

Providing or referring patients to accurate and nonbiased educational materials is paramount. The Internet, once strictly an educational, information-sharing platform, is now highly commercialized. Filter-directed searches tend to yield more purchase options than useful information. A creative Internet-savvy approach is often required to search for educationally sound materials online. Clinicians may wish to identify and recommend some trusted sources to patients, rather than rely on the patient to conduct a search and obtain questionable, if not dubious, information. Web sources that are evidence-based, nonpromotional, and/or are voluntarily certified by Health on the Net (HON) [*http://www.hon.ch/Conduct.html*] are generally the most reliable.

Encouraging patients to review educational materials connected to known health care centers of excellence is also suggested as many will post educational materials on their websites. The American Pain Society (APS) announced recipients of its first *Clinical Centers of Excellence in Pain Management Awards* honoring the nation's outstanding pain care centers. The names and locations of the six multidisciplinary pain programs are posted on the APS website.[20]

For clinicians and patients with a high level of health-related literacy, the Cochrane Collaboration and Agency for Health Research and Quality (AHRQ) both provide meta-analyses of various treatment options and their associated efficacy for review. Specialty topics include, but are not limited to, treatment agreements, aberrant behaviors, urine drug testing, methadone, and addiction. Expert opinion and treatment guidance consensus may be sourced via several professional association/society sites devoted to pain and addiction management. More evidence-based treatment guidelines for both clinician and patient can be found at numerous resource sites indexed at the end of this activity. All of these sources of information must be considered as guidance only and do not represent the ultimate educational or treatment solution. Treatment, like education, must always be individualized and personalized based upon assessment of the whole patient within his/her own environment, always tempered by the expertise of the clinician.

The most recent variation on a theme to emerge from the evolution of informed consent and patient education is shared or collaborative decision making. While shared decision making may be considered just another form of informed consent, it extends further by incorporating evidence-based medicine and requiring *both* patient and clinician to contribute information and participate in the decision-making process.[21] The basic premise of shared decision making is that the clinician guides but the patient decides, based on his/her personal values. Frequently the goals of the patient are unknown or do not match the goals of the practitioner.

Shared decision making, ideally, should be a prerequisite to informed consent.[21] In addition to typical patient education and standard sources of medical information, as previously discussed, newly developed decision aids are available to assist both patient and clinician in the decision process. Health Dialog is a nonprofit independent company that is a vendor to many large corporations and insurance carriers. Health Dialog provides patients with unbiased medical information, teaches them how to prepare for clinician visits, and helps them to consider their personal values and preferences in making medical decisions. Medical health care systems are also using a similar model. Dartmouth-Hitchcock Medical Center has created its own Center for Shared Decision Making, and the Ottawa Health Research Institute (OHRI) offers a vast array of decision support tools.[21] New companies targeting the need for shared decision support are on the increase, competing for available customers. Not all disease states are included, as costs of salaries and production prohibit creating a tool for every medical decision.[21]

Shared decision making offers several patient benefits. 1) it improves patient autonomy, 2) it satisfies the patient's need for more information, 3) it improves the overall well-being of the patient, 4) improves treatment outcomes, and 5) improves satisfaction with overall care.[21] Alternately, it also offers benefits to clinicians. 1) it provides greater insight into the patient's life and values, increasing the clinician's capacity to advise, 2) it improves the patient-clinician relationship; and 3) theoretically, it reduces the clinician's medico-legal liability.[21] On a grander scale, it may also help to reduce health care expenditures across the board by reducing money spent on diagnostic testing, referrals, and unwanted care, thereby treating in alignment with the desires of the patient.[21,22]

Frantsve and Kerns conducted a recent (2007) literature review that examined shared decision making within the context of chronic pain.[23] Their findings suggest that

- Variability in patient-clinician commitment exists
- Many health care providers fail to adequately treat chronic pain and have trouble engaging their patients in shared decision making
- Chronic pain patients may be struggling to be understood as individuals and have their pain legitimized, while the health care providers are focusing on diagnosis and treatment rather than patient-life concerns
- Patient-provider communications related to chronic pain are complex and characterized by each party trying to control the behavior of the other
- Female chronic pain patients may face additional challenges when communicating their pain concerns with the provider in light of stereotypical thinking and bias
- A disconnect exists between patient and provider related to expectations concerning the role of specialist or consultant for chronic pain
- Mixed evidence exists concerning outcomes predictions by both parties.

The authors suggest remedying these issues by placing more emphasis on communication training and efforts to promote a model of shared decision making.[23]

Goal Setting

Once a treatment has been decided upon, goal setting, either therapeutic or personal, is usually the next step. Goal directed health care helps to make the patient assume responsibility for his/her values and intentions and encourages a participatory role within the medical relationship of patient-provider.[24] The patient may be included in goal setting through the use of various tools, such as a treatment agreement (eg, chronic pain, opioid treatment agreement) or action plan. These tools help to motivate the patients, especially if they are included in the content development of completing the information needed for the tool from the beginning. In the area of chronic pain, they also provide established therapeutic boundaries and define consequences and treatment exit strategies prior to a breach in agreement, necessitating an urgent decision or intervention. Motivation is an important criterion of goal setting. It is suggested that when establishing goals, the following descriptors and acronym be kept in mind: **S**pecific, **M**easurable and **M**eaningful, **A**chievable, **R**ealistic, and **T**rackable (SMART).[25]

Goal setting paves the way for patient self-management. Self-management is the ability of the patient to deal effectively with all a chronic illness entails, including symptoms, treatment, physical and social consequences, and lifestyle changes.[26] With effective self-management, the patients can monitor their own condition and, with support, make the cognitive, emotional, or behavioral

changes required and mutually agreed upon to maintain a satisfactory quality of life The idea for the provider is to shift away from an assumed clinical outcome, decided solely by the practitioner, and concentrate on helping the patient better address their own therapeutic goals, including problems of daily living and function associated with chronic disease [26] Treatment strategies are often directed by the patient's goals For example one patient may simply wish for a level of function that permits a return to the ability to perform light gardening, whereas another patient may have to return to work full time and be able to stand for hours at a time. Therapies for each of these patients will be based on separate strategies and will differ greatly

Chronic Pain Management Model Comparison[25]

Medical Management	Self-Management
• Responsibility for pain management placed primarily on the clinician or other medical expert	• Responsibility for pain management on the person with the chronic pain condition
• Person with pain assumes relatively passive role	• Person with pain assumes a more active role
• Emphasis on finding causes and cures	• Emphasis on healthy coping
• Focus on the specific physical aspects of the pain condition	• Focus on the chronic pain syndrome (includes the effects of pain and disability on your entire life)
• Emphasis on medications and passive physical procedures	• Emphasis on taking constructive action and on using mental pain control techniques

In order to accomplish this, barriers to self-management need to be identified and strategies developed to overcome them Clinicians can help by providing education and tools to assist the patient Follow-up is also an integral part of successful self-management and can be accomplished with weekly phone calls, email communications, or patient diary review Community engagement, whether it is live or web-based, functions as a patient support mechanism and validates self-management.[26]

Patient-Centered Model of Care: Patient's Perspective

Simplistic notions that *all* patients and health care providers are willing and able to engage in shared decision making and patient self-management are misguided [23] Studies have demonstrated disparities in health care based on the patient's gender, socioeconomic status, race, ethnicity, culture, age language, and level of education and literacy.[27,28] For example, what support is available to the elderly female chronic pain patient from overseas, who may be unable to speak or read English, who did not partake in formal education, lives as an immigrant in a ghetto of a large city, and is on welfare? Patient advocates or coaches, usually social workers or registered nurses, are trained specifically to help such a patient. Patient advocates recognize that disparity in health care exists and they are prepared to fulfill the ethical gap between patient and the health care machine by supporting patient's health, safety, and rights Health coaching is meant to safely facilitate fulfillment of goals, especially in patient populations with risk of compromised care, or no care at all

Patients with chronic pain don't always make the best choices in analgesic treatment if left on their own with minimal or no medical advice. When pain remains undertreated and the patient self-medicates (with either over-the-counter (OTC) medications or herbs, borrowing a friend or family member's prescribed medications, obtaining street drugs or using alcohol or other recreational drugs to relieve pain), the potential risk of poly- or herb-pharmacologic side effects increases, as does the risk for potential legal ramifications These include, but are not limited to, the use of a prescribed controlled medication not prescribed to the user, and illegal purchase of drugs Self-treatment is generally not disclosed to health care providers when developing a treatment plan and may increase health risks [29-31] The health care advocate or coach can urge the patient to see the practitioner, provide sample questions for the patient to ask, alert patients to their rights, translate medical jargon to lay language and/or translate from one spoken language to another Shared decision making and the education that surrounds it can be navigated by the patient advocate or coach They provide interpretation of the benefit to risk ratio and fill in the gaps related to comprehension. This includes navigating the insurance provider interface and second-opinion guidance Coaches are solely focused on the patient, helping them to self-manage effectively, which may mean engaging family members/spouse/or caregiver to assist The coach or advocate primarily connects with the patient to represent the patient's goals and not those of the advocate/coach or anyone else. Within the United States, state and Joint Commission regulated medical facilities have a responsibility to provide patients with a local source of patient advocacy, usually obtained through the office of ethics within the facility Many health care facilities that specialize in chronic disease management employ full time patient coaches or advocates Sources of patient advocacy include private organizations, health systems, and government agencies and a variety are listed as such at the end of the monograph. In the event that a medical system or practice does not have ready-access to a patient advocate or coach, a family member or significant other may assume the role

The benefits that accompany patient self-management are becoming abundantly clear. Increasing evidence demonstrates that self-management support reduces hospitalization, emergency department use, overall managed care costs, improved therapeutic outcomes and increased patient satisfaction with clinician, treatment, and outcome The essential message for both clinician and patient is that patient-centered care may be new, but it is establishing itself quickly as the care model of the future Ethically and morally, the new model of care is the "right" method to use to care for the sick, and is also supported by positive economics and therapeutic outcomes [26,32-37]

While the patient-centric, shared-decision care model is ethically sound, it is difficult to apply it comprehensively within the confines of a business model, bottom-line driven health care system The current health care environment is fraught with limitations, time allocation, managed care requirements and restrictions, and increasing incidence of chronic diseases and patient volume. All of these limits erode the theoretical paradigm recognized as ethical patient care Clinicians are encouraged to think creatively about their own practice environment. Perhaps only one or two features of the suggested patient-centric, shared decision care model can be incorporated into daily practice Self-willingness to improve the status quo and an increased awareness about treating the patient, not just the disease, are elementary steps needed to initiate an exponential change for the better

Suggested Resource Links

http://www.emergingsolutionsinpain.com
http://www.ampainsoc.org/
http://www.cochrane.org/index.htm
http://www.ahrq.gov/
http://www.guideline.gov/
http://www.painmed.org/
http://www.aspmn.org/html/positionstmts.htm
http://www.npecweb.org
http://www.americangeriatrics.org/products/positionpapers/JGS5071.pdf
http://www.asahq.org/publicationsAndServices/practiceparam.htm

Resource Links for Shared Decision and Decision Aids

http //www healthdialog com/hd
http //www dhmc org/shared_decision_making cfm
http //decisionaid ohri ca/

Resource Links to Health Literacy Tools

http //www adultmeducation com/downloads/Nonadherence_Risk_TOOL pdf
http://www ama-assn org/ama/pub/category/8115 html
http //www askme3 org/
http //www hsph.harvard edu/healthliteracy/index.html

The Newest Vital Sign (NVS) Health Literacy Tool

Link to Nutritional Label
http //www pfizerhealthliteracy com/pdf/FH_vitalsigns_040605 pdf

Link to Accompanying Scoring Sheet
http://www pfizerhealthliteracy com/pdf/FH_vitals_quest8x10_040605.pdf

Available in Spanish.
http //www pfizerhealthliteracy com/physicians-providers/newest-vital-sign html

Resource Links to Patient Advocacy

http://www patientadvocate org/report php
http //www patientadvocate org/
http //pinnacle-care net/campaigns/PCI/2400/index aspx?themeid=5&clickid=PC2400/284
http //www patientsarepowerful org/

References

1 Glajchen M Chronic Pain Treatment Barriers and Strategies for Clinical Practice *J Am Board Fam Pract* 2001,14 178 183

2 Hoffman DE Pain Management and Palliative Care in the Era of Managed Care Issues for Health Insurers *J Law, Med & Ethics* 1998,26 267-89 Accessed on May 1, 2007 at *http //www aslme org/research/mayday/26 4/26 4c php*

3 Tai-Seale M, McGuire TG, Zhang W Time Allocation in Primary Care Office Visits *Health Services Research* (OnlineEarly Articles) doi.10 111*/j 1475-6773 2006 00689 x Accessed on May 1, 2007 at *http://www blackwell-synergy com/doi/abs/10 1111/j 1475-6773 2006.00689 x*

4 *United Press International (UPI)* January 26, 2007 Docs handle Multiple Problems in One Visit Accessed on May 1, 2007, at *http://www upi com/HealthBusiness/view php?StoryID=20070126-035226-2342r*

5 Welshman A Palliative Care Some organisational considerations *Minerva Anesthesiol.* 2005,71 439-443

6 Arnaert A, Ciccotosto G Response phases in methadone treatment for chronic nonmalignant pain *Pain Manag Nurs.* 2006,7.23-30.

7 Parsons S, Harding G, Breen A, et al The influence of patients' and primary care practitioners' beliefs and expectations about chronic musculoskeletal pain on the process of care a systematic review of qualitative studies *Clin J Pain* 2007;23 91-98

8. Kaba R, Sooriakumaran P The evolution of the doctor-patient relationship *Int J Surg* 2007,5 57-65

9 Boyle D, Dwinnell B, Platt F Invite, listen and summarize: a patient-centered communication technique *Acad Med* 2005,80:29-32

10 Lin CT, Platt FW, Hardee JT, et al The Medical Inquiry Invite, Listen, Summarize *J Clin Outcomes Manage* 2005,12 415-417

11 Travaline JM, Ruchinskas R, D'Alonzo GE Patient-Physician Communication Why and How *J Am Osteopath Assoc* 2005;105 13-18

12 Duggan PS, Geller G, Cooper LA, Beach MC The moral nature of patient-centeredness is it "just the right thing to do"? *Patient Educ Couns.* 2006,62 271-276

13 Klitzman R Improving education on doctor-patient relationships and communication lessons from doctors who became patients *Acad Med* 2006,81 447-453

14 Mallardi V The Origin of Informed Consent *Acta Otorhinolaryngol Ital* 2005,25 312-327

15 Jester MM History of Informed Consent *Risk Review 1998* Accessed on June 18, 2007 at *http://www cnahealthpro com/amt/consent_history html*

16 Bloodworth D Opioids in the treatment of chronic pain legal framework and therapeutic indications and limitations. *Phys Med Rehabil Clin N Am* 2006,17 355-379

17 Davis TC, Crouch MA, Wills G, et al The gap between patient reading comprehension and the readability of patient education materials. *J Fam Pract.* 1990,31 533-538

18 Peters E, Hibbard J, Slovic P, et al Numeracy skill and the communication, comprehension, and use of risk-benefit information *Health Aff (Millwood)* 2007,26 741-748

19 Centers for Health Care Strategies What is Health Literacy? Fact Sheet Accessed on May 15, 2007 at *http://www chcs org/usr_doc/Health_Literacy_Fact_Sheets pdf*

20 American Pain Society (APS) Press Room Accessed on May 1, 2007, at *http //www ampainsoc org/press/2007/041207 htm*

21 King JS, Moulton B. Rethinking Informed Consent the case for shared medical decision-making *Am J Law & Med* 2006,32 429-501 Accessed on May 1, 2007, at *http //www fimdm org/pdfs/Staples-King___Mou pdf*

22 Weston WW Informed and shared decision making the crux of patient-centered care *CMAJ* 2001,165 438-439

23 Frantsve LM, Kerns RD Patient-Provider Interactions in Management of Chronic Pain. current findings within the context of shared decision making *Pain Med* 2007,8:25 35

24. Giordano J Changing the Practice of Pain Medicine Writ Large and Small through Identifying Problems and Establishing Goals *Pain Physician* 2006,9 283-285

25 Hanson R *Self-Management of Chronic Pain* Patient Handbook Chronic Pain Management Program Long Beach VA Healthcare System Accessed on May 2, 2007, at *http //www long-beach med va gov/Our_Services/Patient_Care/cpmpbook/cpmp-4 html*

26 Coleman MT, Newton KS Supporting Self-management in Patients with Chronic Illness *Am Fam Physician* 2005,72 1503-1510

27 Ezenwa MO, Ameringer S, Ward SE, Serlin RC Racial and ethnic disparities in pain management in the United States *J Nurs Scholarsh* 2006,38 225-233

28 Green CR, Anderson KO, Baker TA, et al The unequal burden of pain confronting racial and ethnic disparities in pain *Pain Med* 2003,4:277-294

29 Vallerand AH, Fouladbakhsh JM, Templin T The use of complementary/alternative medicine therapies for the self-treatment of pain among residents of urban, suburban, and rural communities *Am J Public Health* 2003,93:923-925

30 Vallerand AH, Fouladbakhsh JM, Templin T Self-treatment of pain in a rural area *J Rural Health* 2004,20 166-172

31 Vallerand AH, Fouladbakhsh JM, Templin T Patients' choices for self-treatment of pain *Appl Nurs Res.* 2005;18:90-96

32 Porter S Collaborative Self-management Key to Care AAFP News Now 6/13/2007, Accessed on June 18, 2007 at *http // www aafp org/online/en/home/publications/news/news-now/annual-clinical-focus/20070613self-management html*

33 Holman H, Lorig K Patient Self-management a key to effectiveness and efficiency in care of chronic disease *Public Health Rep* 2004,119.239-243

34. Disease Management Association of America The benefits of disease management in Medicare and Medicaid Accessed on July 5, 2007 at *http //www.dmaa org/pdf/DM_benefits_MM pdf*

35 Szabo J Patient care Health coaches win big by driving down costs *Hosp Health Netw* 2007,81(2) 28

36 Mead K, Theadom A, Byron K, Dupont S Pilot study of a 4-week Pain Coping Strategies (PCS) programme for the chronic pain patient *Disabil Rehabil* 2007,29(3) 199-203

37 Mosen DM, Schmittdiel J, Hibbard J, et al Is patient activation associated with outcomes of care for adults with chronic conditions? *J Ambul Care Manage* 2007,30(1) 21-29

Activity Evaluation Form

Patient and Clinician: Mutual Shareholders in the Treatment of Chronic Pain

To obtain immediate continuing education credit, please: 1) Visit www.EmergingSolutionsinPain.com — CE Education — Knowledge Series III by August 1, 2010 2) Complete the online self-assessment and evaluation 3) Achieve a minimum score of 70% on the self-assessment 4) Print out your CE certificate

To obtain continuing education credit within four weeks following receipt of a completed form, please: 1) Complete the attached self-assessment and evaluation by August 1, 2010 2) Fax the form to 215-337-0959 or mail completed form to MediCom Worldwide, Inc , 101 Washington St , Morrisville, PA 19067 3) All participants must achieve a minimum score of 70% on the self-assessment to qualify for CE credit 4) The participant will be mailed his/her CE certificate within four weeks following receipt of the completed, qualified form

Participant Information

Name _____

Mailing Address. _____

_____

City. _____ State _____ Zip. _____

License Number/State _____

_____

Date of Completion _____

Participant information is collected for issuance of CE certificate only, and will not be provided to any third party

Professional Degree.

○ MD ○ DO ○ PharmD ○ RPh ○ RN ○ LPN

○ NP ○ PhD ○ Other: _____

○ Technician _____

○ Specialty _____

Activity Evaluation

Please rate the activity by filling in the most appropriate circle

(A) Excellent (B) Good (C) Fair (D) Poor

	A	B	C	D
1 Overall content	○	○	○	○
2 Format	○	○	○	○
How well did this activity achieve its educational objectives?				
3 Compare and contrast the disease-centered model of care with the patient-centered model of care	○	○	○	○
4 Describe three educational resources that may be recommended to patients to assist with the process of their informed consent	○	○	○	○
5 Compare and contrast the traditional model of decision making with the model of shared decision making	○	○	○	○
6 Identify the five descriptors related to the SMART tool used in patient goal setting	○	○	○	○
7 Cite two examples of therapeutic and economic benefits related to patient self-management	○	○	○	○

	Yes	No
8 Do you feel the activity was useful to you in your practice setting?	○	○
9 Do you feel that fair balance was maintained for all therapeutic options?	○	○
10 Would you participate in future self-study activities?	○	○

11 How long did it take you to complete this activity?
○ 50-60 minutes ○ 61-70 minutes ○ Over 70 minutes

Please provide detailed comments and suggestions for future activities.

_____

_____

_____

☐ Please contact me regarding upcoming medical education opportunities

Self-Assessment Questions

1 The traditional model of health care is one centered on
○ a Medications ○ c The disease
○ b The patient ○ d The cure

2 A health care model based on the patient's perspective, and not centered on the disease, is called
○ a Shared health care ○ c Advocate care
○ b Managed care ○ d Patient-centric care

3 Which is an example of closed questioning?
○ a How are you feeling?
○ b Tell me about the pain
○ c Is the pain better or worse since the last time I saw you?
○ d How is the quality of your sleep?

4 "Invite, listen, summarize" is an efficient and effective communication method to encourage
○ a Interview style dialogue between clinician and patient
○ b Open-ended questioning
○ c Patient-centric care
○ d All of the above

5 Three educational resources that may be used to assist the patient with informed consent include all but which of the following
○ a Personal discussion with clinician
○ b Patient education brochures from professional association
○ c Promotional brochure from drug manufacturer
○ d Website of a highly respected university medical center

6 SMART is an acronym to keep in mind when helping patients establish goal setting SMART stands for
○ a Specific, measurable and meaningful, achievable, realistic, and trackable
○ b Sports-based, measurable, activity-based, time-based
○ c Sequential, meaningful, algorithmic, trial-based
○ d Specific, measurable, allowable, realistic, time-based

7 Prior to providing education to a patient, it is considered most crucial to assess
○ a The patient s support network
○ b The patient s level of health care literacy
○ c The patient s ability to follow directions
○ d The patient's support group's level of health care literacy

I certify that I have completed this educational activity as designed Signature _____ Date _____

esp™ Emerging Solutions in Pain

CE-Accredited Monograph

Electronic Prescription Monitoring Programs: A Data-Reporting Tool Designed to Prevent Drug Diversion

David B. Brushwood, RPh, JD

"We shape our tools and afterwards our tools shape us."

—Marshall McLuhan
(1911-1980)

Activity Release Date: October 1, 2007

Period of Validity: October 1, 2010

PROGRAM OVERVIEW

As digital technologies continue to advance, real-time reporting of controlled substance prescribing and use is not only possible, it is currently available. Data mining, through use of electronic prescription monitoring programs (ePMPs), is a valuable option for prescribers who want to contain risk of abuse, misuse and diversion of controlled drugs, but only when the reports are interpreted by someone who views the information as a piece of a larger picture. ePMPs are not a panacea and do not replace the current best practice approach of opioid prescribing, *Universal Precautions in Pain*. As an adjunct to care, with system use and report results interpretation tailored to the individual patient, ePMPs can help support patient management decisions and provide additional documentation. Controversy exists among health care providers, patients, government and law enforcement agencies on exactly how and when the information gleaned from ePMPs should be used and by whom. Until more evidence becomes available, ePMPs must be considered for use on an individual case-by-case basis and their results interpreted in relationship to all other known factors.

TARGET AUDIENCE

This activity is designed for physicians, pharmacists, physician assistants, and nurses who have an interest in enhancing their knowledge and understanding of pain management.

LEARNING OBJECTIVES

Upon completion of this activity, participants should be able to:

- Describe the role ePMPs play in the risk containment model relative to opioid prescribing
- Identify who initiates and sets standards for ePMPs
- Describe how ePMPs work and the value of the reported data to patient management
- Cite two examples of patient-types whose care may benefit from ordering and interpreting ePMP results

GENERAL INFORMATION

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There are no fees for participating in this activity. All participants must complete the Activity Evaluation Form. Participants must receive a minimum score of 70% on the self-assessment portion of the form to qualify for CPE credit. Certificates may be printed immediately after completing the online self-assessment and evaluation.

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FACULTY BIOGRAPHY

David Brushwood is a professor of pharmacy health care administration at the University of Florida, College of Pharmacy. A graduate of both the school of pharmacy and the school of law at the University of Kansas, Professor Brushwood practiced both professions prior to joining the faculty at the Philadelphia College of Pharmacy. Professor Brushwood spent five years at West Virginia University, and became a faculty member at the University of Florida in 1990. In 2006, he established an online part-time masters program in Pharmacy Regulation and Policy.

Professor Brushwood's research interests are in the areas of regulating for outcomes, medication error prevention, and pain management policy. He has received grant funding from numerous agencies and was twice selected as a Mayday Scholar in Pain Policy by the American Society of Law, Medicine & Ethics. Professor Brushwood recently completed an educational video documentary called "Collateral Damage in America's War on Drugs: The Battle of Redding California." His current research investigates the perspective taken by media on pain management and drug diversion.

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To identify and resolve conflicts of interest the educational content was fully peer reviewed by a member of the MediCom Worldwide, Inc. Clinical Content Review Committee who has nothing to disclose. The resulting activity was found to provide educational content that is current, evidence based, and commercially balanced.

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Introduction

Pain is the most common reason prompting visits to health care providers. Chronic pain is experienced by 50 million Americans and is the most common cause of long-term disability. One-third of Americans will experience chronic pain at some point in their lifetime, with the burden of this condition anticipated to increase as the population ages and the incidence of chronic health conditions rises.[1-7]

Current estimates suggest that only 25% to 40% of persons experiencing chronic pain achieve adequate pain management due to underprescribing of analgesics. This is despite the fact that sufficient knowledge and resources are available to effectively manage pain in 90% of individuals with chronic pain.[1,2,5] In contrast to these reports of underprescribing, recent data demonstrate as opioids and other analgesics are recognized as addictive and are increasingly prescribed for patients without cancer pain, the rate of misuse of these medicinal drugs is on the rise.

Statistics show that prescription (medical and nonmedical) drug abuse, misuse, addiction and diversion are escalating. Recent data show that there were 6.4 million or 2.6% of Americans using prescription-type psychotherapeutic drugs nonmedically in the past month. Of these, 4.7 million used pain relievers. Current nonmedical use of prescription-type drugs among young adults aged 18-25 increased from 5.4% in 2002 to 6.3% in 2005. Nonmedical use of psychotherapeutic drugs has increased to 6.2% in the population of 12 years or older with 15.172 million persons, second only to marijuana use and three times the use of cocaine. Parallel to opioid supply and nonmedical prescription drug use, the epidemic of medical drug use is also escalating with Americans using 80% of world's supply of all opioids and 99% of hydrocodone. The multiple reasons for continued escalation of prescription drug abuse and overuse are lack of education among all segments including physicians, pharmacists, and the public; ineffective and incoherent prescription monitoring programs with lack of funding for a national prescription monitoring program NASPER; and a reactive approach on behalf of numerous agencies.[8,9]

The NASPER Act of 2005 is a law that provides for the establishment of a controlled monitoring system in each state. The system tool is designed with interstate communications capabilities. The concept for NASPER originated with the American Society of Interventional Pain Physicians (ASIPP).

Three main goals of NASPER include[8]:

- Physician and pharmacist access to monitoring programs
- Monitoring of Schedule II to IV drugs
- Data sharing across state lines

The NASPER Act authorized funding of $60 million from fiscal years 2006 to 2010 for federal grants at the US department of Health and Human Services to facilitate or improve state-run electronic prescription drug monitoring programs. Unfortunately, NASPER has not been fully realized as no funding was allocated in 2006 or 2007 and there is no proposed funding expected in the near future (2008).[8]

To date, approximately half of the states in America have adopted electronic prescription monitoring programs (ePMPs) using grant funding from an alternate source, the Harold Rogers Prescription Drug Monitoring Program, managed by the Department of Justice. These programs are designed to track the use of prescribed controlled substances and enable health care providers to know whether a patient has received controlled substances from another source.[10] ePMPs provide information that may be used as a risk-screening tool to alert the health care provider to a potential problem. Not unlike a clinical laboratory test that suggests a potential problem, positive screens from an ePMP report should prompt further inquiry rather than force formulation of an immediate conclusion. They provide an important part of the picture, but not the whole picture.

Monitoring programs are not without controversy. The underlying assumption of these programs is that prescribers and pharmacists are a significant source of diverted drugs and that, if given better knowledge of medication use data, prescribers and pharmacists can more carefully guard the nation's drug supply and prevent the diversion of pharmaceutical products.[10] Critics point out that the sources of diverted drugs have not been clearly established, and that Internet sales, burglaries, employee theft, drug sharing, and theft from patients may be the most significant leaks from the system.[11] There is also significant concern about putting the onus on health care professionals to prevent diversion, because these professionals are actually the victims of crimes rather than perpetrators, when diversion occurs through patient deception.[12] Health care providers' efforts to control access to pharmaceutical products may unnecessarily restrict the availability of medications to patients who medically need them.

How They Work

Without a viable national program, state laws create ePMP programs and the states set their own standards. The Harold Rogers Grant Program *encourages* both sharing of information and prescription data across states and submission of Schedules II, III, IV and V, but it is entirely up to each individual state to decide on specific program requirements. Refer to Table 1.[10]

Table 1. States with Legislation Enabling a Prescription Monitoring Program (as of November 2006)

	State	Program Type	Schedules Covered	Year Enacted
1	AL	Electronic	C II-V	2004
2	CA	Single copy serialized, Electronic	C II-V	2005
3	CO*	Electronic- Jan 2007	C II-V	2005
4.	HI	Electronic	C II-V	2002
5	ID	Electronic	C II-V	2001
6	IL	Electronic	C II	1999
7	IN	Electronic	C II-V	2004
8	KY	Electronic	C II-V	1998
9	ME	Electronic	C II-V	2003
10.	MA	Electronic	C II	1992
11	MI	Electronic	C II-V	2002
12.	MS	Electronic	C II-V	2005
13	NM	Electronic	C II-IV	2004
14	NY	Single copy, serialized/ Electronic (state issued)	C II, Benzos	1998
15	NV	Electronic	C II-V	1995
16	NC*	Electronic – March 2007	C II-V	2005
17	ND*	Electronic		2005
8.	OH	Electronic	C II-V	2005
9	OK	Electronic	C II-IV	1990
10.	PA	Electronic	C II	1972
11	RI	Electronic	C II-III	1997
22.	TN	Electronic	C II-IV	2002
23	TX	Single copy, serialized/ Electronic (state issued)	CII	1997
24	UT	Electronic	C II-V	1995
25	VA	Electronic	C II-IV	2002
26	WA	Electronic	Limited Triplicate	1984
27	WY	Electronic	C II-IV	2004
28	WV	Electronic	C II-IV	1995
29	IA*	Electronic - 2007	C II-IV	2006
30.	CT*	Electronic	C II-V	2006
31	SC*	Electronic – January 2008	C II-IV	2006
32.	VT*	Electronic	C II-IV	2006
33.	LA*	Electronic - 2007	C II-V	2006

* Program is not currently operational - anticipated start date is listed

States differ in the ways they do this. Most states list the drugs to which their program applies and require that pharmacies upload data on the dispensing of listed drugs every 15 to 30 days. These data are then aggregated into a single database that can be queried. A health care provider who affirms that he or she has responsibility for providing services or products to a patient may submit a query about the patient and will receive a report on that patient. Some states provide "real-time" response, while others have a lag time in their response which may necessitate two patient visits before a complete picture of the patient's prior medication use is available.[13]

In developing the report, the agency that controls the database will adopt rules for determining when there is a match between the data and the query. Many patients have the same or similar names and birthdates. If an agency insisted on an exact match between the name in the query and the name in the database, then the report might be incomplete because small errors in the data could potentially produce a falsely negative report. On the other hand, if the agency were to report data from names that seemed similar to the name in the query, but were not exactly the same, then the report might be too inclusive and may result in a falsely positive report. Health care providers need to be aware of these system limitations so they can guard against making conclusions that fail to consider the possibility of a false positive or false negative report.[13,14]

Access to the data by law enforcement varies from state-to-state. There is generally an awareness that it would be counterproductive to allow law enforcement to engage in a "fishing expedition" using the database to find patients, prescribers and pharmacists who seem to fit a pattern that may indicate criminal activity. Participation in the program by health care providers, and support of the program by the public, would be significantly diminished if this type of law enforcement activity were permitted. The purpose of the program is not meant to be punitive but rather offer a tool used for prevention of illegal drug diversion activity. On the other hand, when a health care agency has evaluated the data and determines that criminal activity is likely to have occurred, some states permit, or require, a referral to law enforcement with limited data disclosure.[13,14]

Potential Benefits of ePMPs

One of the keys to effective patient care is gathering the necessary information to form an accurate impression of the patient and of the circumstances in which the patient functions. This information comes from a variety of sources, including the patient, family caregivers, medical records, tests, and other diagnostic tools.[15] The ePMP program is intended to provide an additional piece of information that the health care provider uses to make a decision. The ePMP does not make any decisions itself. Its reports are not self-authenticating. An ePMP report that suggests a patient may have received medications from another provider should be evaluated and discussed with the patient. It is a beginning and not an end. What it can do is provide a picture over time of how a patient has been using medication, and perhaps provide evidence that a patient should be reevaluated because what has been done has not worked well. It removes the health care provider from a situation in which the patient's self-report of past medication use, as

valuable as that report may be, is not the only information on which the health care provider can rely.[13,14]

Patients who have a legitimate need for controlled substances, but who also engage in aberrant behaviors suggestive of activities such as drug hoarding, drug sharing, or self-initiated dose escalations, can be identified through the analysis of ePMP data. These patients can be appropriately counseled and they can be placed on strict limits that are geared toward normalizing their medication use. Doctor-shoppers who have no need for controlled substances, and who are duping prescribers and pharmacists into providing these medications, can also be identified and relationships with them can be terminated or transitioned. Patients who are positively identified as drug dealers and are known to be profiting from illegal drug trade can and should be reported to law enforcement agencies.[10,13,14]

A "clean" ePMP report can provide confidence to a health care provider that their patient is probably not abusing or diverting drugs. It can restore trust in a relationship threatened by ambiguous patient behaviors that have created serious questions in the mind of the health care provider. The health care provider, confused by subjective information that is difficult to interpret, may be relieved to review the objective results of the ePMP report. It is important to remember, however, that a clean report does not always represent an authentic appraisal of the patient, especially if the patient is using an alias and provides false identification.[16] Again, results should be reviewed but their interpretation must be tempered in context with other available information. All best-practice risk containment measures should be utilized regardless of the ePMP results.

Potential Problems of ePMPs

The accuracy of reporting programs is dependent on the validity of the patient's identity. Health care providers should always require a government-issued photo identification card from anyone who is provided access to controlled substances.[16] On the basis of this verified identification, data are transmitted to the centralized database and queries can be made. Doctor-shoppers, who accurately identify themselves, will quickly be recognized through data analysis.[10] The ready availability of fraudulent identification documents, at surprisingly low cost, creates the possibility that doctor-shoppers will continue their activities as before, but use a false identity with each prescriber and/or pharmacy. This potential problem may lead some health care providers to become overconfident and provide controlled substances based on an acceptable ePMP report, even when other circumstances should warrant concern and may have raised concerns in the absence of the report.[13,14] Comfort zones are sometimes too comfortable.

A separate problem with ePMPs is that they may be viewed as the mandatory standard required of anyone who prescribes or dispenses controlled substances. In a malpractice case or administrative action against a health care provider who has inadvertently participated in drug diversion and who has not used an ePMP program, the conclusion may be reached that the applicable standard of care requires use of the ePMP program and that the health care provider necessarily falls below the standard of care when an ePMP program is not used. The result of this unrealistic standard setting could be a reluctance of health care providers to become involved in the provision of controlled substances. Prescribing health care professionals may ask, "If controlled substances cannot be provided without using an ePMP and if using an ePMP is time consuming and/or cumbersome, then why even bother to provide controlled substances?" There are already medical practices and pharmacies that have "no narcotics" policies. The incidence of this practice could increase if the provision of controlled substances becomes even more time consuming. The possibility that mandatory ePMP use could become the recognized standard of care in the provision of controlled substances highlights the importance of having the health care professions clarify that using an ePMP is completely discretionary and not mandatory.[14]

Effective Use of an ePMP

There are many techniques that health care providers can use to avoid the necessity of an ePMP. These include:

- Obtaining a government-issued photo ID from every patient *and making a photocopy of the ID for the medical record*.[16,17]
- Initiate treatment with drugs other than controlled substances, and/or verify that a patient has used controlled substances responsibly in the past.[15,17]
- Promote frequent and reliable communication between the prescriber and the pharmacy.[7]
- Conduct an assessment of a patient's potential for abuse or addiction, using a validated instrument, such as the Opioid Risk Tool (ORT) or SOAPP®.[15,17]
- Establish firm, but fair, rules for medication use, and commit those rules to writing if necessary, for example, use of an opioid treatment agreement.[15,18]
- Use of best-practice risk containment methodologies, such as Universal Precautions in Pain.[15,19]

If a patient of long standing, who is well known, poses no apparent potential for abuse or addiction, then there is no need for use of ePMP. Likewise, for a patient who has an active addiction issue, or who has stolen prescription pads or fraudulently authorized prescriptions in the past, an ePMP report will be of little use. The ePMP report is useful for the "in between" patients who are not clearly free from drug misuse problems or who are not obviously already in trouble.[14]

Any potential problem that is raised by an ePMP report should be discussed with the patient. There is the possibility that the report is in error, and patients should be given the opportunity to clarify the false impression created by an erroneous report. On the other hand, explanations should not be accepted uncritically. Some objective evidence to support an explanation must be provided. The decision to prescribe or dispense, despite a problematic ePMP report, should be clearly explained in the patient care record.[14,17]

Do ePMPs Work?

Evaluations of ePMPs have been inconclusive. Interviews of program administrators have led to the optimistic conclusion that the programs are effective. Physicians to whom researchers have been referred by program directors have similarly been positive in their assessment of the programs. However, these

are not sources of authority that one would expect to be unbiased. More extensive program evaluations should be conducted to determine the benefits and costs of the programs, as well as whether the costs justify the benefits.[13]

Ultimately the test of program effectiveness will be whether drug abuse associated with diverted pharmaceuticals is decreased. Recent evidence suggests that as more ePMP programs are developed, the abuse of diverted pharmaceuticals has continued to increase. It is impossible to know from these data alone whether the increase in abuse would have been even greater had the programs not been implemented. If the majority of controlled substance diversion is from sources other than prescribers and pharmacists, it is unrealistic to expect that diversion will be significantly reduced by the programs, and the programs should be reconsidered in light of their associated costs. Until definitive research is conducted, health care providers should continue using the available programs in ways that seem to be of benefit to their individual practices.[13,14]

Case Studies

State ePMP programs offer the opportunity to acquire significant knowledge about a patient's prior drug use, but they are not necessarily useful with every patient. Just as laboratory tests must be used judiciously, and should be ordered only when they will provide useful information in the care of a patient, ePMP reports should be used only when needed and they should be used for a specific purpose.[14] The overuse of laboratory tests and other diagnostic procedures, when they are not really necessary, has been criticized as "defensive medicine."[20] Patients are inconvenienced by defensive medicine and health care costs are increased unnecessarily.[20] There is a risk that the overuse of ePMP reports could similarly produce unnecessary barriers to appropriate care and drive up the costs of health care. This is particularly true in states that do not have "real-time" access to ePMP data, thus requiring that patients for whom a report has been ordered return for a second visit after the report has been received. While it is certainly appropriate for prescribers of controlled substances to seek a comfort level with their prescribing, and to use ePMP reports as a means to become comfortable with prescribing, it is unnecessary and potentially counterproductive to order a report with every patient since ePMP data may offer little value. Likewise, there are some patients for whom ePMP data may be useful periodically, but not with every visit. An examination of case studies can demonstrate when ePMP reports can be useful and when they may not be necessary.[13,14]

The following cases are representative of the assortment of chronic pain patients who may present to a health care facility on any given day for treatment. These cases are meant to highlight the value of the ePMP for certain case-types under specific circumstances. Prescribers must continue to use established treatment guidelines for patient assessment as well as their own clinical expertise to fully determine overall risk on a case-by-case basis.

Remember that ePMP availability and requirements vary from state to state and may not be available for use in your practice location.

Case Study #1

"MC" is a 57-year-old white female who has been diagnosed with systemic lupus erythematosus or SLE. The rheumatologist has been treating osteoarthritis in the patient's knee with tramadol. Over the past five years, MC has tried several nonsteroidal anti-inflammatory drugs (NSAIDs), which she tolerated poorly, reporting that they hurt her stomach and made her ears ring. The tramadol was initially effective, but after 18 months of using it at increasing doses, the analgesic effect was no longer satisfactory. MC requested that she be given "something stronger" to control her pain. She was very assertive and she insisted that a more potent analgesic be prescribed for her. MC has been referred to physical therapy (PT) on several occasions, and she consistently complies with PT orders, reporting that the PT she learns to do at home is helpful but is not sufficient to control her joint pain.

The rheumatologist was concerned by MC's assertiveness and insistence that she be prescribed a stronger drug. MC's inability to use nonopioids effectively, combined with her posture of "refusing to take no for an answer" made the rheumatologist uncomfortable with the idea of prescribing opioids for MC. The rheumatologist considered ordering an ePMP report for MC before prescribing opioids for her.

Analysis: This is a situation where ordering an ePMP report is probably not necessary. There is no indication that MC has acquired medications from another prescriber or that she is irresponsible in her use of medications. The ePMP would not be useful and need not be ordered. Opioids can be prescribed for MC, with appropriate instructions on their effective use, and her use of them can be monitored without ePMP reports.

Case Study #2

"JJ" is a 32-year-old white male who fractured two vertebrae when he fell from his mountain bike at the age of 18. The fractures healed without surgery. When he was 27 years old his old back injuries began to cause him chronic pain, and he was treated by a pain specialist who gradually increased JJ's medication to 40 mg daily of sustained-release oxycodone. At this dose, JJ was fully functional at work and he had no unmanageable side effects. JJ realized that he may eventually require surgery, but he preferred medication management at the time.

JJ recently moved to a new town to take a promotion with his employer. He has been referred to a new pain specialist, and has had all of his records sent to the new specialist. He requests that the new specialist continue his oxycodone at the current dose.

Analysis: The new pain specialist should order an ePMP report for JJ before prescribing any opioids for him. While there is no reason to believe that anything is amiss, the "new in town" story has been typically used many times by drug diverters to obtain access to controlled substances. A "clean" ePMP report will justify continuing JJ on his current medication. The situation should be evaluated critically to assure that JJ is in fact who he says he is, and is not using an alias. This is a situation in which an ePMP need not be ordered every time opioids are prescribed, but it would be wise to order a report every 6 to 12 months.

Case Study #3

"CB" is a 37-year-old white male who has a history of chronic anxiety and of migraine. He works part-time at two fast food restaurants. His health care coverage is through a community plan for the "working poor" financed by a half percent sales tax. He smokes one pack of cigarettes daily. Although he is college educated, CB has been unable to secure full-time work since pleading guilty to embezzlement of funds from a former employer. CB is divorced and has primary custody of his 17-year-old son. His son has recently begun recreational use of marijuana, and this is a concern to CB who does not want his son to begin using other drugs illicitly.

Approximately one year ago CB fell off a horse and he has complained of back pain ever since. Due to his irregular work schedule, CB feels he cannot schedule office visits with a primary care provider. He has visited the emergency department 14 times in the past year. ED physicians have not been able to determine the cause of CB's back pain. All results from diagnostic imaging procedures have been negative. Each time CB visits the ED, the ED physicians order Demerol® 75 mg and Phenergan® 50 mg IM, and CB is discharged with a prescription for hydrocodone and paracetamol (acetaminophen) (Vicodin®) 7.5/750 mg #24, with directions to take 1 tablet p.o. q 4-6 hrs as needed for pain.

Analysis: CB needs to make a commitment to finding a primary care provider who can consistently manage his pain more successfully than the ED physicians have been able to do. Whether he is successful in doing this or continues to use the ED regularly, an ePMP report should be ordered for CB every time he presents with pain and requests opioids. While the concern is not about diversion, because there is no evidence that any diversion is occurring, there is a strong possibility that the quality of CB's medical care can be improved with constant and comprehensive monitoring. The ePMP reports are a means to this end. ED records are not reliable documents to demonstrate continuity of care. Insistence by ED physicians that they obtain an ePMP report each time they prescribe opioids for CB is good medical practice and the inconvenience of this to CB may convince him to arrange the time required to find a primary care provider.

Case Study #4

"PW" is a 53-year-old white female who presented at her orthopedic surgeon's office complaining of back pain after a fall at work. A myelogram was performed and the results were negative. The orthopedic surgeon prescribed a 30-day supply of acetaminophen with codeine #3 and discharged PW. Three months later PW returned after reinjuring herself at work. Physical therapy was prescribed. The PT sometimes helped PW's pain and at other times made it worse. Four months later, PW fell in the shower and was taken to the ED where she was diagnosed with a compression fracture of one of her vertebrae. The orthopedic surgeon treated her again. Although the fracture resolved, the pain persisted and the orthopedic surgeon prescribed acetaminophen with codeine #3. One year later PW fell and fractured three ribs. Although the ribs healed, PW returned to the orthopedic surgeon because of an exacerbation of the pain in her back. The orthopedic surgeon treated her with Percocet® (oxycodone with acetaminophen). PW was injured again one year later. Her back pain worsened and a calf contracture was so severe that she was walking on her toes. The orthopedic surgeon diagnosed PW as showing classic symptoms of reflex sympathetic dystrophy or RSD. He prescribed sustained-release oral morphine.

The orthopedic surgeon received a report from a pharmacist that PW was obtaining opioid analgesics from two other physicians. In addition, the pharmacist reported that PW was misusing injectable morphine prescribed by one of the other physicians by directly injecting it instead of using it in a pump. The orthopedic surgeon contacted the other physicians and requested that they discontinue prescribing opioids for PW, which they agreed to do. He instructed PW to use only those drugs prescribed by him. Shortly thereafter, following an automobile accident, PW was admitted to an inpatient detoxification program, which she left the following day against medical advice. She explained to the orthopedic surgeon that she had ceased all medications on her own, and had gone through withdrawal, thus detoxifying herself. PW soon returned complaining of excruciating pain. The orthopedic surgeon determined that PW required continued opioids to control her pain. He prescribed sustained-release oral morphine. The pharmacist to whom this prescription was presented reported to the orthopedic surgeon that both PW and her husband had been prescribed injectable morphine, sustained-release oxycodone and diazepam by another physician the day before.

Analysis: This orthopedic surgeon is certainly extremely forgiving. He understands that PW continues to need analgesia, but he is faced with a difficult challenge in providing it. If he continues to prescribe opioids for PW, he should order an ePMP report every time he sees her, and he should clarify with PW that she has run out of extra chances should the ePMP report indicate that she has acquired controlled substances from another prescriber. There are limits to what a health care provider can be expected to do for a patient, and this patient has stretched the boundaries to the point that she can have no more leeway in bending or breaking the rules. This scenario would have been more easily managed if the prescriber had established an opioid treatment agreement, including an exit strategy, at onset of therapy.

Conclusion

Many health care providers take seriously their responsibility to prevent the diversion of controlled substances and to promote responsible use of medications by patients who need them, but education is often lacking in the therapeutic area of pain management [9] Reports provided by ePMP programs have been shown to facilitate the prevention of diversion and the promotion of rational medication use, but no patient monitoring program is perfect, and ePMPs are no exception [13,14] Mindful of the possibility that a report could be in error, health care providers should be cautious users of reports provided by ePMPs and include their use only as an adjuvant to guideline-recommended risk screening methodologies These reports often provide useful information which should be taken seriously and should be critically evaluated in context to other known patient data. Used cautiously as an important piece of an often complex puzzle, ePMP reports may assist in preventing diversion and improve the quality of patient care [13,14]

References

1 Berry PH, Covington EC, Dahl JI, et al Pain: Current understanding of assessment, management, and treatments American Pain Society 2006 Accessed October 3, 2007 at *http //pain-topics.org/pdf/Pain_APS_2006.pdf*

2 American Pain Foundation Accessed March 19, 2007 at: *http://www.painfoundation.org/*

3. Mularski RA, White-Chu F, Overbay D, et al Measuring pain as the 5th vital sign does not improve quality of pain management. *J Gen Intern Med.* 2006;21:607-612

4. Burton AW, Fanciullo GJ, Beasley RD, et al Chronic pain in the cancer survivor: A new frontier. *Pain Med.* 2007;8:189-198

5. National Pain Education Council. Appropriate opioid pharmacotherapy for chronic pain management Accessed October 3, 2007 at: *http://www.npecweb.org/npec/CME.Guidelines/pdfs/Mono01.pdf*

6 National Guidelines Clearinghouse. Assessment and Management of Chronic Pain. Accessed October 3, 2007 at *http://www.guideline.gov/summary/summary aspx?ss=15&doc_id=10724&nbr=005586&string=Assessment+and+%22Management+of+Chronic+Pain%22*

7. Taylor RS. Epidemiology of refractory neuropathic pain. *Pain Pract.* 2006;6:22-26

8 Manchikanti L National drug control policy and prescription drug abuse: facts and fallacies. *Pain Physician.* 2007;10:399-424.

9. Manchikanti L. Prescription drug abuse what is being done to address this new drug epidemic? Testimony before the Subcommittee on Criminal Justice, Drug Policy and Human Resources *Pain Physician* 2006,9 287-321

10. US Department of Justice Drug Enforcement Administration Office of Diversion Control. A Closer Look at State Prescription Monitoring Programs Questions and Answers Accessed October 3, 2007 at *http://www.deadiversion.usdoj.gov/faq/rx_monitor.htm*

11 Joranson DE, Gilson AM A much needed window on opioid diversion. (Editorial) *Pain Med* 2007,8:128-129

12 Joranson DE, Gilson AM. Drug Crime Is a Source of Abused Pain Medications in the United States. *J Pain Symptom Manage* 2005,30.299-301

13. IJIS Institute Consulting Engagement Report PMP PMIX Pilot Project Survey of State Prescription Monitoring Programs Committee Phase II January 26, 2007. Accessed September 10, 2007 at *http://www.deadiversion.usdoj.gov/pubs/program/ijis_pmix_survey20070204.pdf*

14. Brushwood D Maximizing the Value of Electronic Prescription Monitoring Programs *J Law Med Ethics.* 2003,31:41-54

15. Federation of State Medical Boards, the United States, Inc Model Policy for the use of Controlled Substances in the Treatment of Chronic Pain 2004 Accessed October 2, 2007 at: *http://www.fsmb.org/pdf/2004_grpol_Controlled_Substances.pdf*

16. Brushwood DB VIGIL A five-step process approach to opioid prescribing and dispensing. *Practical Pain Management.* 2006

17. Ziegler PP Treating Chronic Pain in the Shadow of Addiction. *Practical Pain Management* 2007

18. Manchikanti L, Manchukonda R, Damron KS, et al. Does adherence monitoring reduce controlled substance abuse in chronic pain patients? *Pain Physician.* 2006;9:57-60

19 Gourlay D, Heit H, Almahrezi A Universal precautions in pain medicine: A rational approach to the treatment of chronic pain *Pain Med* 2005;6:107-112

20. Kessler DP, Summerton N, Graham JR. Effects of the medical liability system in Australia, the UK, and the USA *Lancet.* 2006;368 240-246

Activity Evaluation Form

Electronic Prescription Monitoring Programs: A Tool to Prevent Drug Diversion

To obtain *immediate* continuing education credit, please: 1) **Visit www.EmergingSolutionsinPain.com — CE Education — Knowledge Series III** by October 1, 2010 2) Complete the online self-assessment and evaluation 3) Achieve a minimum score of 70% on the self-assessment 4) Print out your CE certificate

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○ Technician·_____

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Activity Evaluation

Please rate the activity by filling in the most appropriate circle

(A) Excellent (B) Good (C) Fair (D) Poor

	A	B	C	D
1 Overall content	○	○	○	○
2 Format	○	○	○	○

How well did this activity achieve its educational objectives?

3 Describe the role ePMPs play in the risk containment model relative to opioid prescribing	○	○	○	○
4 Identify who initiates and sets standards for ePMPs	○	○	○	○
5 Describe how ePMPs work and the value of the reported data to patient management	○	○	○	○
6 Cite two examples of patient-types whose care may benefit from ordering and interpreting ePMP results	○	○	○	○

	Yes	No
7 Do you feel the activity was useful to you in your practice setting?	○	○
8 Do you feel that fair balance was maintained for all therapeutic options?	○	○
9 Would you participate in future self-study activities?	○	○

10 How long did it take you to complete this activity?
○ 50-60 minutes ○ 61-70 minutes ○ Over 70 minutes

Please provide detailed comments and suggestions for future activities.

_____

_____

_____

☐ Please contact me regarding upcoming medical education opportunities

Self-Assessment Questions

1 Who is considered the originator of the ePMP?
- ○ a Federal government
- ○ b Drug Enforcement Agency (DEA)
- ○ c State government
- ○ d Local municipalities

2 All ePMP reporting occurs in real-time
○ a True ○ b False

3 Law enforcement agency access to ePMPs is required by law in all states
○ a True ○ b False

4 A "clean" ePMP report signifies no potential aberrant behaviors, no risk of abuse, misuse and diversion Opioids may be safely prescribed without risk or concern
○ a True ○ b False

5 The intention of the ePMP is to
- ○ a Provide definitive and reliable reporting information for use in managing every patient
- ○ b Offer additional information that may prove beneficial to patient management decision making
- ○ c Provide criminal activity reporting for use in initiating punitive action against a prescriber or patient
- ○ d Identify doctor-shoppers only

6 In the event of mandatory use, ePMPs may, inadvertently, become a barrier to opioid prescribing
○ a True ○ b False

7 ePMPs have demonstrated conclusive evidence as to their value in decreasing diversion of prescribed controlled substances
○ a True ○ b False

8 Which is not considered a technique used to contain risk when prescribing controlled substances?
- ○ a Obtain a government-issued photo ID
- ○ b Conduct an assessment of the patient's potential to abuse, misuse or divert drugs
- ○ c Rely soley on the patient's self-report of previous drug use
- ○ d Establish firm, but fair rules for medication use and commit those rules to writing (ie, opioid treatment agreement)

9 If a patient is new to the town in which the medical practice is located, an ePMP report request is strongly suggested
○ a True ○ b False

I certify that I have completed this educational activity as designed Signature _____ Date _____

The following table was updated in November 2008 and has been provided as a replacement to Table 1 on page 3 of the *Electronic Prescription Monitoring Programs* monograph

Table 1. States with Legislation Enabling a Prescription Monitoring Program (as of November 2008)

	STATE	PROGRAM TYPE	SCHEDULES COVERED	YEAR ENACTED	DATA COLLECTION Started
1	AL	Electronic	C II-V	2004	April 2006
2	AK*	Electronic	C I-V	2008	
3	AZ	Electronic	C II-IV *2008*	2007	October 2008
4	CA	Single copy serialized, Electronic	C II-IV	2005	January 2007 (1939)
5	CO	Electronic	C II-V	2005	July 2007
6	CT	Electronic	C II-V *2008*	2007	July 2008
7	HI	Electronic	C II-V	2002	July 1999 (1992 – II only)
8	ID	Electronic	C II-V	2001	Oct 1997
9	IL	Electronic	C II-V	1999	April 2000/Jan 2008
10	IN	Electronic	C II-V	2004	January 2005
11	IA*	Electronic	C II-IV *2008*	2006	
12	KY	Electronic	C II-V	1998	January 1999
13	KS*	Electronic	C II-IV	2008	
14	LA	Electronic	C II-V	2006	November 2008
15	ME	Electronic	C II-IV	2003	July 2004
16	MA	Electronic	C II	1992	April 2002
17	MI	Electronic	C II-V	2002	January 2003
18	MS	Electronic	C II-V	2005	May 2006
19	MN*	Electronic	C II-III *Jan 2009*	2007	
20	NV	Electronic	C II-V	1995	January 1997
21	NJ*	Electronic	C II-IV	2008	
22	NM	Electronic	C II-IV	2004	July 2005
23	NY	Single copy, serialized/ Electronic (state issued)	C II, Benzos	1998	July 1982
24	NC	Electronic	C II-V	2005	July 2007
25	ND	Electronic	C II-V	2005	September 2007
26	OH	Electronic	C II-V	2005	May 2006
27	OK	Electronic	C II-V	1990	July 2006
28	PA	Electronic	C II	1972	Late 2002
29	RI	Electronic	C II-III	1997	July 1997
30	SC	Electronic	C II-IV	2006	January 2008
31	TN	Electronic	C II-IV	2002	December 2006
32	TX	Single copy, serialized/ Electronic (state issued)	CII II-V *Sept 2008*	1997	July 1982
33	UT	Electronic	C II-V	1995	January 1997
34	VT*	Electronic	C II-IV *Jan 2009*	2006	
35	VA	Electronic	C II-IV	2002	June 2006
36	WA	Electronic	Limited Triplicate	1984	Limited program
37	WV	Electronic	C II-IV	1995	December 2002
38	WY	Electronic	C II-IV	2004	July 2004

* Program is not currently operational – anticipated start date is listed.

esp™ Emerging Solutions in Pain

Monograph

Neuroimaging: Interpreting Addiction

David Schlyer, PhD

"Just because you got the monkey off your back doesn't mean the circus has left town."

—George Carlin

The following monograph is included as a resource for information purposes only.

PROGRAM OVERVIEW

The rapid expansion of modern molecular imaging* methods since the time of their initial conception in the 1970s has given rise to numerous discoveries of molecular mechanisms that underlie brain function in health and disease [1] Early functional imaging studies of patients with Parkinson's disease and schizophrenia produced unexpected correlative findings which inspired researchers to image other conditions (ie, addiction, chronic pain), conditions once perceived as voluntarily induced or imagined

Researchers using results from functional molecular imaging and genetic testing have recently probed the physiologic basis of addiction, redefining it as a neurologic, genetic, environmental, and behavioral disease process These findings are in stark contrast to beliefs of addiction as a psychological disorder arising from a lack of willpower or compromised moral affect [2]

Memory, drug-related cues, neuromodulators, neurotransmitters, and the immense power of the brain's reward pathway are now implicated as direct contributors to the origination and progression of addiction [3] Findings such as these are changing the strategic approach to treating addiction from one of a punitive nature to one that is medically sound and evidence based The future of therapeutics formulated or designed to treat addiction is a novel and exciting one Substantial commonalities exist among drugs of abuse, and the knowledge of these common mechanisms together with the continued elucidation of the neurobiological underpinnings of withdrawal symptoms, drug intake, craving, relapse, and comorbid psychiatric associations are critically important for the development of new therapeutic strategies [4] Preventive agents (vaccines) and therapies for addiction will no longer adhere to the traditional and typical pharmacologic formulation, but rather transit to novel, personalized, and targeted designs that will include use of proteomics, genetics, molecular intervention, and nanotechnology [3] The clinician's approach to an addicted patient or to a patient at high risk of addiction and their subsequent treatment is on a trajectory of change Learning how new data will influence the clinical environment is timely and essential to providing optimal patient care while containing risk

*Molecular imaging techniques directly or indirectly monitor and record the spatio-temporal distribution of molecular or cellular processes for biochemical, biological, diagnostic or therapeutic applications Radiologic Society of North America and Society of Nuclear Medicine Molecular Imaging Summit Oak Brook, IL 2005 Accessed October 9, 2007, at ***http://www.rsna.org/publications/rsnanews/jul05/misummit.html***

TARGET AUDIENCE

This activity is designed for physicians, pharmacists, physician assistants, and nurses who have an interest in enhancing their knowledge and understanding of pain management and addiction medicine

LEARNING OBJECTIVES

Upon completion of this activity, participants should be able to.

- Define addiction and recognize the scope and negative impact of addiction on the lives of the addicted patient and the American public
- Outline how the perception of addiction has changed with the advent of medical neuroimaging technologies, differentiate the five types of medical imaging modalities used to image the brain
- Identify dopamine as the common feature to all addictive agents and state the role of dopamine relative to the rewards pathway
- Summarize how recent discoveries made via molecular imaging of the brain may influence future therapies and patient management of addiction

FACULTY BIOGRAPHY

A tenured senior scientist within Brookhaven National Laboratory's Medical Department, David Schlyer, PhD, is also an adjunct professor of biomedical engineering at Stony Brook University He was awarded a bachelor of science degree in chemistry from the University of California at Riverside in 1971 and a PhD in chemistry from the University of California at San Diego in 1976 Dr Schlyer joined Brookhaven National Laboratory's Chemistry Department as a postdoctoral fellow to research the development of radioisotope tracers for diagnostic medical imaging From 1981 to 1985, Dr Schlyer worked as a corporate research chemist and then as chairman of a hospital research department He returned to Brookhaven Lab in 1985 and continued his work on radioisotope production and to develop new detector and scanning technologies for medical imaging He also serves as a consultant for the International Atomic Energy Agency

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It is the policy of MediCom Worldwide, Inc to plan and implement educational activities in accordance with the ACCME, ACPE and California Board of Nursing As a provider, it is the policy of MediCom Worldwide, Inc to ensure balance, independence, objectivity, and scientific rigor in all its sponsored educational activities

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FACULTY FINANCIAL DISCLOSURE

The presenting faculty reported the following Dr David Schlyer has disclosed that he has no significant relationships with the grantor Cephalon, Inc or any other commercial company whose products and services may be related to his presentation

PLANNER AND PROVIDER FINANCIAL DISCLOSURE

The individuals listed below from MediCom Worldwide, Inc reported the following for this activity Joan Meyer, executive director and Alan Vogenberg, RPh, FASCP, clinical advisor have nothing to disclose

Jeffrey Gudin, MD was the clinical reviewer for this activity and has nothing to disclose Ruth Widmer, medical writer of Corona Productions has nothing to disclose

CONFLICT OF INTEREST RESOLUTION

To identify and resolve conflicts of interest the educational content was fully peer reviewed by a member of the MediCom Worldwide, Inc. Clinical Content Review Committee who has nothing to disclose The resulting activity was found to provide educational content that is current, evidence based, and commercially balanced

OFF-LABEL/ INVESTIGATIONAL DISCLOSURES

In accordance with MediCom Worldwide, Inc policy, the audience is advised of the following disclosures regarding unlabeled or unapproved uses of drugs or devices Dr Schlyer indicated that his presentation will include the discussion of bupropion, varenicline, disulfiram, vanoxerine, aripiprazole, modafinil, topiramate tiagabine, baclofen, and valproic acid for the treatment of cocaine addiction, none of these products are approved for this use in the United States Dr Schlyer has also indicated that is presentation will include discussion of BP-897, this product is not approved for any use in the United States.

This activity is supported by an independent educational grant from Cephalon

Introduction

Addiction is a chronic, relapsing disease of the brain characterized by compulsive drug use which continues despite attempts to stop taking drugs, participation in drug treatment programs, and recognition of the harmful consequences of drug use [2] Addiction should not be confused with drug tolerance** or dependence† A quintessential biobehavioral disease, addiction tends to intensify as the drug of abuse transforms the brain and leads to altered behavior [2] There is a risk factor for drug abuse in all of us made up of a combination of our genetics, the environment in which we live, and the stress we feel in our everyday lives Although an addict's first use of drugs is typically voluntary, with continued use, the anatomy and functionality of the neural system are changed irreversibly and lead to an inability to exert control over their actions Although the timeline to addiction varies with the individual, addictive effects increase with each use of the drug These effects constitute a major barrier to treatment, as high risk of relapse remains even after long periods of abstinence and disappearance of withdrawal symptoms [5] Research on the consequences of addiction has demonstrated physical changes in areas of the brain responsible for judgment, decision making, learning, memory, and behaviors [2,5] Addictive drugs produce positive reinforcing behaviors that are often cue-induced from areas in the brain that also feature cue-induced positive reinforcing behaviors required for human survival (ie, sex, food, and shelter) Genetics, motivation, and reward all play a role in addiction [5,6]

Addiction is not a new phenomenon In the mid-1800s, smoke-filled parlors, made freely available to opium smokers, were established in major American cities, such as San Francisco and New York In 1875, the city of San Francisco adopted an ordinance prohibiting the smoking of opium in smoking houses or "opium dens " This was the first formal step toward making drugs of abuse illegal in the United States in response to their addictive qualities and negative effects on the addicted individual and society [7,8] In spite of these early attempts at control, by the early 1900s there were an estimated 250,000 addicts in the United States. Today, some 30 years after President Richard Nixon's declaration of the War on Drugs (c 1971), America's addiction problem has become a national public health crisis.[9] According to 2005 survey data reported by the federal Substance Abuse and Mental Health Services Administration (SAMHSA), 22 2 million persons ages 12 and older were classified with substance dependence or abuse [10]

These statistics are staggering and the associated effects impact our society in many ways In the workplace, absenteeism, reduced productivity and a lack of trust are major problems stemming from substance abuse that affect the efficiency and success of companies across the country Occupational accidents are more frequently suffered by those who abuse drugs, endangering themselves and those around them Despite the serious nature of the issue and the wide adoption of policies and programs, many Human Resources (HR) professionals are not referring employees to treatment programs Less than one-quarter (22%) of HR professionals say their companies openly and proactively deal with employee substance abuse and addiction issues [3] A high percentage of deaths related to motor vehicle accidents are also attributed to driving while under the influence, and drug-related crime wreaks havoc, violence and death not only in major US cities, but also in rural America Illegal gun trade helps to fund illegal drugs, creating a culture of violence Friendships are lost and family life is negatively impacted Babies born of addicted mothers are often addicted and will require specialized care for years Many homeless individuals are afflicted with drug or alcohol abuse and some addicts also suffer comorbid mental illness Many of these people end up in prison rather than in psychiatric hospitals, resulting in taxpayer cost burden [8] Even drug abuse prevention exacts a toll; at last estimate, the War on Drugs is costing the American taxpayers $40 billion each year [9]

For the addict, the personal suffering of drug abuse extracts more than a simple monetary penalty Addicts suffer daily by not being able to live their lives Their sole purpose or motivation from the moment they wake up each morning is to obtain the drug of abuse, supplanting almost all other goals The goal of drug-seeking can cause addicted parents to neglect their children and families, to commit crimes, and to alienate those who love them Withdrawal symptoms, effects from "bad" drugs, and other physical harm, including death, is a constant threat Comorbidities related to drug addiction include HIV-AIDS, stroke, cancer, cardiovascular disease, forms of hepatitis and cirrhosis, pulmonary disease, obesity, and various mental disorders (ie, depression, anxiety) [2] The constant internal battle of not being able to stop the abuse, and at the same time seeing the destruction the drug abuse is causing, may create a world of self-loathing for the addict [5,8]

When addicts need medical treatment for their addiction or another medical disease, how are they treated by the clinician? Frequently, clinicians stigmatize these patients and prescribe to widely held myths about addiction The practitioner may feel the patient lacks the willpower to stop abusing the drugs The perception may be that the patient lacks sufficient strength of moral character, and many people feel that addicts should be punished, not treated, for abusing drugs Clinicians may think that people who become addicted to one drug will automatically be addicted to all drugs A final myth is that addicts cannot be treated with medications, especially controlled substances, prescribed for pain The truth is that people who become addicted did not begin their lives by wishing to become addicts Too often addicts are perceived as "hopeless characters " Many are ashamed to admit to addiction and often do not voluntarily seek medical treatment. Clinicians need to be proactive in assessing and monitoring their patients for addiction and for increased risk of drug abuse Once addiction or high risk of drug abuse is identified, clinicians need to involve the patient in a highly structured treatment plan/program or refer the patient to a specialist in the study of addiction [2]

Evidence obtained with sophisticated medical imaging technologies, accompanied by genomic research is redefining addiction The findings of the past 20 years are only now beginning to retire the old myths surrounding addiction. These myths were, and are, commonly held by many medical professionals New data obtained from imaging studies and genomic research is providing evidence-based information to improve upon the current state of addiction therapy and redirect methods needed to produce more effective and novel therapeutics

**Tolerance is a state of adaptation in which exposure to a medication results in changes that decrease one or more of the drug's effects over time Being tolerant to a medication is not addiction

†Physical dependence is an expected state of adaptation typical of a particular class of medication It can result in withdrawal syndromes if there are abrupt decreases in the patient's medications Physical dependence is different from addiction

Reference: The American Academy of Pain Medicine, The American Pain Society, and the American Society of Addiction Medicine recognize these definitions and recommend their use

Neuroimaging

A Historic Perspective

Beginning in 1895, with Wilhelm Conrad Roentgen's discovery of X-radiation, scientists have wanted to "see" inside the brain. Basic skull radiographs demonstrate primarily the bony calvarium, or skull, offering a limited structural view, at best. In 1918, a neurosurgeon, Walter Dandy, performed ventriculography and pneumoencephalography.[11,12] These procedures were devised to visualize the ventricles of the brain by injecting air into the patient's spinal canal and withdrawing an equal amount of cerebrospinal fluid and rotating the patient upside down in a circular 360° movement to insure adequate filling of all ventricles. These exams were extremely time consuming and often produced no, or limited, results as many patients were unable to comply due to the extreme and unpleasant side effect profile related to both of the procedures. In 1927, the first cerebral arteriogram was performed using a direct puncture to the carotid artery to inject a contrast agent, outlining the arteries of the brain.[12] It was not until the early 1970s, however, that computed axial tomography (CAT/CT) images of the brain were obtained in the clinical environment using an invention of Dr. Godfrey Hounsfield. As an x-ray passes through any substance, it is attenuated to some extent. The denser the object, the more the x-ray is attenuated. The genius of Dr. Hounsfield was to combine many of these views taken at many angles together and, thereby, create an image of the interior of the object. This allowed us to see inside the skull. He received the Nobel Prize for his invention only seven years after the first clinical images were published. By that time, more than 1,000 scanners were in operation in hospitals around the world.[13] Originally these scans were referred to as EMI scans, named after the company (EMI, Ltd.) where Dr. Hounsfield, worked. This laboratory, previously called Electric and Musical Industries, Ltd., was economically founded on profits derived from publishing the vocal and instrumental talents of The Beatles.[12-14]

Another modality, magnetic resonance imaging (MRI), originally referred to as nuclear magnetic resonance (NMR), soon followed and was clinically available in the early 1980s.[15] MRI uses magnetic and radio frequency (RF) energies, rather than x-rays, to acquire tomographic images of the brain. In a strong magnetic field, the protons contained in water molecules (and other compounds as well) have a tendency to align themselves with the magnetic field and oscillate with a characteristic frequency. If there is a gradient in the magnetic field, protons in different locations will oscillate with slightly different frequencies. Using a strong pulse of RF energy, it is possible to flip these spins to a high energy state that is far from being in equilibrium with the environment. As the proton spins regain their equilibrium state, a small signal is given off and it is possible to listen with a sensitive radio receiver and measure this signal. The time it takes the protons in different locations to return to their equilibrium state gives an indication of their immediate environment. The protons relax with two different characteristic times called T1 and T2.[16] A computer can be used to process all this information and reconstruct an image of the density of the protons in each location and give an indication of the type of environment surrounding them. These breakthroughs offered more sophistication, improved patient compliance and improved data collection and display, but resultant brain images showed only the anatomy or structure.

During this same time period, researchers in nuclear medicine were also developing more sophisticated imaging modalities, such as single-photon emission computed tomography (SPECT) and positron emission tomography (PET).[15,17] Quantitative and qualitative data provided by these two nuclear imaging technologies represent brain function or dysfunction at a molecular level rather than gross anatomy or structure. Nuclear SPECT and PET are commonly referred to as molecular imaging modalities. By injecting radiopharmaceuticals labeled with a single photon emitting radionuclide (ie, technetium 99m (99mTc MIBG) for SPECT or a positron labeled radiotracer (ie, fluorine-18 fluorodeoxyglucose (^{18}FDG) for PET, it was possible to determine how the brain is functioning.[15,17] Brookhaven National Laboratory was instrumental in the early development of both the generator for Tc-99m and FDG. Alternately, in clinical research, PET studies measuring glucose 18FDG tracer uptake in areas of increased neural activity, conducted in 1981 by Dr. Michael Phelps at UCLA, showed how different areas of the normal brain responded to specific activities (eg, seeing, hearing, talking, walking, and remembering). [Figure 1.] This methodology was referred to as "brain mapping."[18] As the technology advanced, scans of the brain were ordered by oncologists to demonstrate tumor growth (increased uptake of radiopharmaceutical tracer due to increased metabolic activity) to calculate tumor-staging, and to measure lesion shrinkage or remission (decreased uptake of radiopharmaceutical tracer) after radiation or chemotherapy. PET studies were also used in radiation treatment planning to target radiation beams precisely at the tumor, thereby sparing normal brain tissue.[17] Today, three-dimensional or volumetric imaging also serves as surgical guidance to help reduce secondary trauma to the brain during an operative procedure. By the early 1990s, advances in MRI technology evolved to produce functional MRI (fMRI). Functional MR imaging maps brain activity by measuring oxygenated blood (demonstrated by areas of intense signal, as increased brain activity requires increases blood flow rich in oxygen), referred to as blood oxygen level dependent (BOLD) fMRI.[19,20] MR spectroscopy, first available in the 1990s, provides measurement of certain chemical components found within the brain. In a strong enough magnetic field, it is possible to separate the proton frequencies of water from the frequencies of certain natural chemicals in the brain with adequate concentration, which may then be accurately identified and measured (eg, glutamine gamma-aminobutyric acid (GABA), N-acetylaspartate (NAA). Each metabolite reflects specific cellular and biochemical processes. For example, NAA is a neuronal marker and decreases with any disease that adversely affects neuronal integrity.[21]

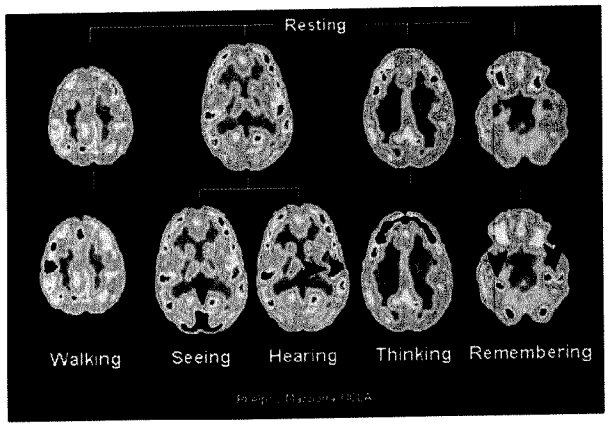


Figure 1. Brain Map Using PET Imaging Technology[18]
(Phelps, Mazziotta, UCLA. Used with permission.)

The Current Environment

In the mid- to late-1980s, neuroimaging moved from basic brain function studies to assessment of other neurological diseases, such as schizophrenia, addiction, Alzheimer's and Parkinson's, with the first results of a qualitative MRI neuroimaging study of schizophrenia published in 1986.[60] PET neuroimaging emerged shortly thereafter as a result of the development of injectable PET radioisotope ligands designed to go to a specific receptor or enzyme. PET measures cerebral blood flow quantitatively and has led the field of neuroimaging since its emergence.[61] With PET, there was an interest to image the dopamine D2 receptor system which is heavily involved in some of these disease states previously mentioned, including addiction. Every substance which is known to be addictive to humans has some involvement with the dopamine receptor system and this has prompted intense research into the dopamine system and imaging studies of the addicted human brain. It has also prompted interest in not only dopamine receptors, but also in those receptor systems which interact with the dopamine system (eg, serotonin, GABA and opioid). Currently, neuroimaging benefits from all of the following imaging modalities. [Table 1.]

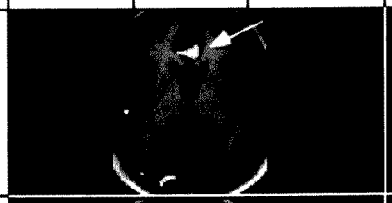
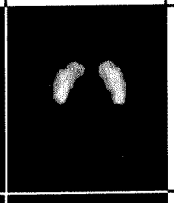
IMAGING TECHNIQUE	Structural magnetic resonance imaging (MRI)	Functional magnetic resonance imaging (fMRI)	Magnetic resonance spectroscopy (MRS)	Positron emission tomography (PET)	Single photon emission computed tomography (SPECT)
Principal Applications	Map tissue morphology, composition	Visualize changes in oxygenation and blood flow associated with brain activities	Measure cerebral metabolism, physiological processes involving specific brain chemicals; detect drug metabolites	Quantify biochemical and pharmacological processes, including glucose metabolism; drug distribution and kinetics; receptor-ligand interaction; enzyme targeting	Measure receptorligand interaction, physiological function, biochemical and pharmacological processes
Example of Addicted Brain					
Example of Control					

Table 1. Neuroimaging Addiction *(Adapted from Fowler JS, Volkow ND, Kassed CA, Chang, L. Imaging the addicted human brain. Sci Pract Perspect. 2007;3(2):4-16.)*

Table 1 shows examples of MRI and PET brain images. MRI and PET imaging modalities are used to image the brain and demonstrate evidence of addiction by visualizing areas affected by the drug and comparing the findings to a brain of a control participant. Arrows point to the anterior cingulate area, which is activated in cocaine-addicted patients (Addicted Brain image row) but not in healthy volunteers (Control image row).[64]

The images from two or more of these modalities may be combined or overlaid offering multimodal data sets. These types of dual concomitant image acquisitions are referred to as fusion imaging and combine anatomic or structural information with physiologic or functional display all in one image (see Figure 2).[22] Scanners are just coming on the market which combines two modalities such as MRI and PET in a single scanner. Mapping specific molecular function to precise neural anatomy is a necessity in order to understand the relationship between the two.

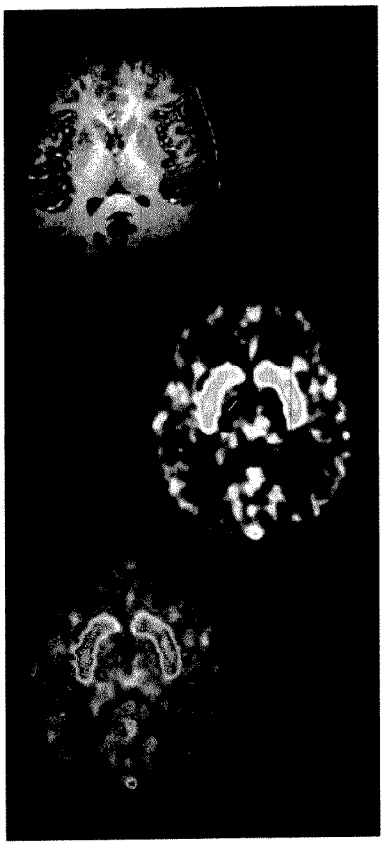


Figure 2. *The image shows the MRI image of the brain on the top and the PET image of the same person in the center. The image at the bottom is the fused image showing the receptor density of the dopamine D2 receptors overlaid on the anatomical image. (Courtesy of Dr. Gene-Jack Wang and Aarti Kriplani)*

It is possible to assess some aspects of neuronal damage or functional compromise of the addicted brain by comparing images acquired from a control group of non-addicts to a study population of addicts using these modalities. In the future, imaging may also used to determine some aspects of an individual's increased vulnerability to substance abuse and this is an area of active research. This information may help with treatment strategy by providing a prediction of relapse.[23]

Clinicians may ask...
"What is the one factor common to addictive disease that enables molecular imaging assessment and monitoring?"

Interpreting Addiction: Dopamine: The Common Denominator

Dopamine is a natural substance used by the brain to modulate responses to transmitted signals traveling from one neuron to another. Dopamine does not actually affect how the signals are transmitted or conducted, but rather modifies or amplifies the sensitivity of response by the target neurons to the incoming neurotransmitter message or signal.[24,25] Just as the dopamine system is commonly involved with interactions in Parkinson's disease, it is also commonly involved in interactions related to the disease of addiction, and crucial to motivation, craving and seeking, degree of inhibition, compulsion or drive, and reward and positive reinforcement. The neuroimaging technologies and radioactive tracer molecules previously mentioned permit visualization of the dopamine system, allowing imagers to detect dysfunction and structural damage attributed to use of addictive drugs. PET radiotracers, designed to bind to D2 receptors, produce a signal of high intensity in control groups. In the addicted person, however, the level of endogenous dopamine is increased, and receptor availability, and perhaps even the number of receptors, is reduced, resulting in a diminished signal. There also appears to be a global reduction in perfusion (with perfusion defects observed in cocaine abusers).[24,25]

Featured are various examples of molecular imaging and the reported outcomes demonstrating the differences in brain integrity and function in addicted vs. control (non-addicted) brains. [Figure 3.]

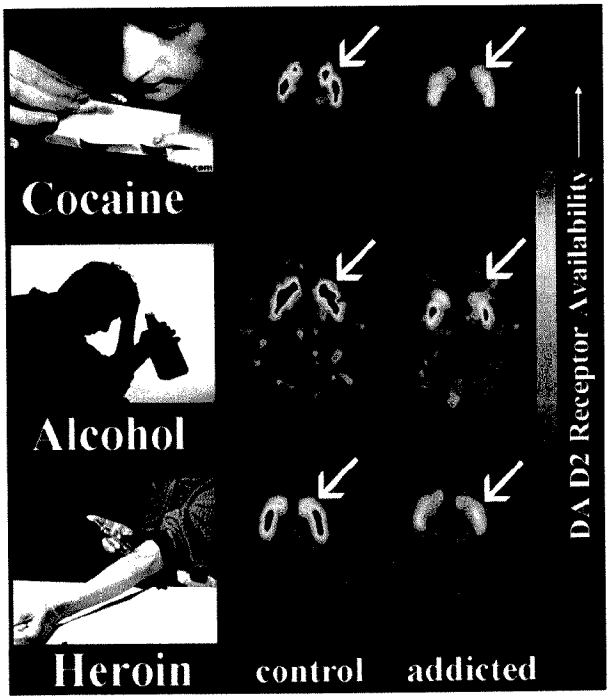


Figure 3. *PET images of the dopamine receptors showing the common features shown by the addicted brain compared to brain of the control study participant. In all cases the number of available receptors is reduced in the addicted brain, as shown by the arrows. (Images courtesy of Dr. J. S. Fowler and Dr. Gene-Jack Wang)*

Drug Abuse Effects

All drugs of abuse (including nicotine) increase the normal amount of dopamine in the brain. Different drugs increase dopamine via different brain messenger pathways. Drugs may affect the number of dopamine transporters or receptors or the response of these cellular messengers to dopamine.[26-31] Increased dopamine can create abnormal function and responses to all of the behaviors controlled by the dopamine system: motivation, craving and seeking, compulsion, reward, and reinforcement. This includes the ancient behaviors or "rewards" essential to survival, for example, the need for sex and food. Drug seeking is associated with activation of reward neural circuitry. When the reward pathway is activated by the drug, taking the drug takes on equal importance with these essential rewards.[24,25,32] In addition to behavioral and cognitive changes occurring during active use of the drug, the abnormal neuronal functions continue even after discontinuing the drug, long after withdrawal symptoms have subsided. Drug associated cues, in the absence of active drug administration, can also produce the same result.[27]

The central nervous system is one of the primary targets for the detrimental effects of drugs of abuse. Structural neuroimaging techniques such as CT and MRI, with new analytical approaches such as voxel-based morphometry (investigation of focal differences in brain volume) have shown widespread changes in stimulant and opiate abuse and atrophy, particularly in the frontal lobes. Functional neuroimaging techniques such as PET, SPECT and fMRI reveal altered regional cerebral activity by all drugs of abuse.[62] Evidence of brain plasticity and atrophy (shrinkage) has been documented in various imaging studies of addicts with results indicating that frontal lobes, limbic system, and cerebellum are particularly vulnerable to damage and dysfunction. Atrophy of the brain contributes to transient or persistent loss of memory, diminished cognitive ability, and compromised reasoning and decision making, depending upon which brain areas are affected and severity and duration of chronic substance abuse.[33,34] With abstinence, maintained for more than six months, partial function may return, but studies have shown that full recovery of these compromised structures is usually not attained.[35]

Other studies have shown that abuse of heroin, morphine derivatives, cocaine and methamphetamine may increase the rate of strokes and stroke-related mortality.[36,37,63] In one study, a rare form of leukoencephalopathy (destruction of the myelin sheaths that cover nerve fibers) has been described in those abusers who inhale heroin vapors. Other neurologic complications include atrophy and various infectious processes.[63] The exact mechanism of cocaine-induced stroke remains unclear and there are likely to be a number of factors involved including microvascular ischemic changes, narrowing of the blood vessels, inflammation of the blood vessels in the brain, enhanced formation of clots in the blood vessels, formation of clots in the heart which then migrate to the brain, and surges in blood pressure, all associated with altered cerebral autoregulation.[38]

How a person responds to a drug of abuse is highly individualized and dependent upon the number of dopamine receptors (D2) available. Dopamine receptors have a much higher concentration in certain areas of the brain than in others, and studies of brain physiology have shown that certain areas of the brain are associated with a particular function.[24,28,32] Specific pathways within the brain transfer messages from one region to another and process our responses to outside stimuli of all kinds. Some of the pathways for the dopamine system in the brain are illustrated in a simplified manner in Figure 4.

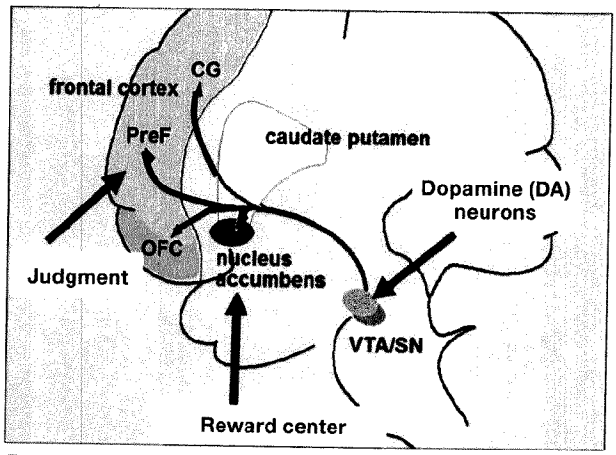


Figure 4. *Brain dopamine (DA) system showing the connections from the substantia nigra (SN) and ventral tegmental areas (VTA) up to the nucleus accumbens and caudate and putamen extending up into the orbital frontal cortex (OFC) and prefrontal cortex (PreF) and cingulated gyrus (CG). These areas are labeled as to their function with the arrows.*

Genetic and Epigenetic Influences

Genetic predisposition to some extent determines the number of dopamine receptors. Imaging studies have demonstrated that those individuals with a high number of D2 receptors react with aversion to the increase in dopamine as a result of an administered drug of abuse.[3] People possessing a low number of D2 receptors find pleasure in response to increased amounts of dopamine and are often predisposed to addictive behaviors.[24] The number of D2 receptors may also be affected by use of the drug, and prolonged use may desensitize the rewards pathway of the brain. This desensitization may result in a lack of positive feedback from not only the drug, but other naturally reinforcing experiences. This theory may provide the rationale of why the addicted person may seek and require incrementally larger doses of the drug in order to gain a pleasurable response, termed tolerance. The hypothesis has been demonstrated and proven in rodents, but not in humans.[24,25,29] Twin, family, and adoption studies show that genetic factors can play a significant role in vulnerability to becoming addicted to drugs.[39] Genetics play a role in our response to drugs that alter dopamine levels in the brain. An example is a polymorphism in catechol-O-methyltransferase (COMT) which is an enzyme that deactivates dopamine in the brain. One common gene variant in this enzyme increases COMT activity and, therefore, decreases the amount of dopamine naturally present in the extracellular spaces where messages are transmitted.[40] How these polymorphisms may affect predisposition and response to treatment for addiction is an emerging area of research.[39] Gender also appears to play a role in risk of addiction. It has been reported that although men are more apt to have opportunities to use drugs, both men and women are equally at risk for addiction after first use. In a study conducted on men and women who had used cocaine long-term, it was suggested that men and women had different patterns of recovery, with men showing twice as many transitions between use and abstinence as women during the same period of time.[41] This finding may have some implications in the treatmont methods which may be applied according to gender.

Environmental and Social Influences

Factors affecting risk of addiction are already at work in the prenatal environment. The environment and behaviors of the mother directly impact the developing fetus. After the child is born, environment also helps to determine risk of addiction.[2] A permissive environment that invites early experimentation with drugs, even cigarettes, may increase the risk of addiction, as dopamine increases and begins to modulate behavioral response to not only the first-use drug, but also to cues of the first-drug experience and the desire to replicate the initial of feeling of pleasure. Peer pressure to abuse drugs is also a dominant environmental factor for increased risk of addiction, as is the adult culture of pill-popping and med a saturation of "a pill for every ill".[2] The negative impact created by these factors may be evidenced by the recent and unprecedented increase in drug abuse by adolescents and teenagers in rural areas and cities across America.[10]

Remission, Relapse and Recovery

Remission

Addiction may be treated comprehensively with lifestyle changes and, in some cases, detoxification and medication. Lifestyle changes may include changing the location of the home or the environment related to drug abuse, making new friends and giving up old ones (especially those who are also addicts or who provided drugs of abuse), finding a psychological and spiritual support system (enrollment in a 12-step program, membership in a religious organization, or yoga/meditation group), physical exercise (exercise has been shown in animal studies to increase the number of D2 receptors in the brain) and good health habit maintenance, including good nutrition and adequate sleep. Detoxification programs are available in the inpatient and ambulatory patient settings as well as in the hospital environment.[2,42]

Most drugs of abuse share common neurochemical pathways which produce acute reward and long-term neuroadaptations leading to addiction. The growing understanding of the mechanisms responsible for persistent changes in these common pathways is critical for the development of new therapies for the treatment of drug addiction through pharmacology.[4] Currently, few pharmacologic options are available to treat addiction, as exemplified by treatments for the addiction to nicotine. Smokers constitute the largest group of addicted people, numbering an estimated 1.3 billion worldwide as reported by the World Health Organization.[44] Nicotine replacement therapy has been used for several years to help people overcome smoking addiction, but these therapies do not treat the active addiction to nicotine. A treatment that actually attempts to address the addictive effects of nicotine is bupropion, which is a norepinephrine and dopamine reuptake inhibitor.[45-47] Another pathway and mechanism of action is that of varenicline, a partial nicotine receptor agonist formulated to help users quit smoking and avoid relapse.[45-47]

Pharmacologic treatment options for addiction to illicit and prescription drugs are, unfortunately, even more limited than treatments for nicotine addiction. Methadone is a maintenance drug commonly prescribed as a substitute for heroin. It provides a less pleasurable response and reduced side effects if prescribed and administered properly.[45] Buprenorphine is an opioid drug with partial agonist and antagonist actions and is FDA-approved to treat opioid addiction. Naloxone is a narcotic antagonist that is FDA-approved for use in combination with buprenorphine to treat addiction and is also approved for use alone as a reversal agent in the event of drug overdose.[2,41,45] The primary mechanism of action of buprenorphine affects opiate receptors targets for heroin, morphine, and prescription opioids in the brain.[4,45] This effect helps to relieve drug cravings without promoting a feeling of intense high or eliciting harmful side effects. In combination with naloxone, the potential for buprenorphine to be abused is further reduced, as

anyone who attempts to inject it to get high will experience severe withdrawal symptoms. Alternately, if administered by mouth, as prescribed, no adverse effects occur. The use of this drug in an approved outpatient setting increases treatment availability for the addicted patient.[4,45]

There are ongoing studies on the pharmacological treatment of cocaine addiction based on the understanding of the mechanism provided by imaging studies. These fall into two groups. Some target compounds studied act in a similar manner to cocaine and produce an unpleasant hyperstimulation. These compounds either inhibit the dopamine transporter in a similar fashion to cocaine or block the destruction of dopamine by the enzymes which normally do this job. Some of these are BP-897, a D3 partial agonist, disulfiram, an inhibitor of dopamine β-hydroxylase, vanoxerine, a highly selective inhibitor of dopamine uptake, and aripiprazole, a partial mixed-action agonist. Another approach is to use the interactions between neurotransmitters to blunt the response of cocaine. One common route is to use compounds that increase gamma-aminobutyric acid (GABA) levels in the brain. This increase in GABA causes a decrease in the release of dopamine and, therefore, blunts the high from cocaine. Recent studies have indicated that modafinil, which enhances glutamate levels, is effective in promoting cocaine abstinence in cocaine abusing people. Some placebo-controlled studies also reported the effectiveness of topiramate, which increases GABA levels, and of tiagabine, a GABA reuptake inhibitor also approved as an anticonvulsant, both compounds increased cocaine abstinence with no serious adverse events. Promising results came from two more compounds acting on the GABA circuits, baclofen and valproic acid.[4,45,48]

Another approach to the problem of addiction is using vaccines to help people overcome addictions such as smoking, drug abuse, and obesity. People can still use the drug or substance of abuse, but they will no longer get the rush and feel good after using it. The first study of vaccines for cocaine addiction was conducted at Columbia University, investigating the impact of vaccinating chronic cocaine-dependent volunteers who were not actively seeking to reduce or stop their cocaine use. Results demonstrated that volunteers who successfully developed good levels of anti-cocaine antibodies in their blood experienced an attenuation of the "high" normally expected from cocaine use. This response also resulted in a substantial reduction in the amount of cocaine the volunteers reported using.[49]

Relapse

Relapse may occur at any time, especially during times of stress. Cues related to previous drug abuse, however subtle, may trigger a relapse. The reward system does not differentiate between "good" and "bad" rewards. The feeling of initial pleasure is what an addict seeks, the memory of the first pleasurable experience keeps the addict "hooked on searching" for a repeat experience as pleasurable as the first. If relapse does occur it is important for the addict to seek further treatment and begin again, one step at a time, on the therapeutic path to remission.[2,42]

Recovery

An addict is never considered fully recovered due to the nature of the disease. The primary goal of treatment is long-term abstinence.[2,42]

An Optimistic Future

Thanks to the research efforts of many, new insights into addiction continue to be realized and findings published. Armed with new data, drug developers may formulate novel therapeutics that will serve to prevent or discourage addiction either through intervention or immunization,[50,51] while other treatments or design formulations may simply reduce the pleasurable effects of drugs of abuse, and therefore reduce use liability.[50,52-54]

As imaging technologies continue to advance, molecular imaging will grow in importance. Advances in proteomics and genomics will expand the number of relevant molecules to visualize. New hardware and imaging concepts will provide improved imaging results and offer alternate imaging options. The use of multimodality imaging, where the results of two or more imaging modalities are combined to give a more complete picture of the biological processes occurring in the body, is a research tool which is just now coming into use. Other novel imaging techniques such as magnetoencephalography (MEG) and neurotransmitter PET (ntPET) are emerging applications for use in the study of addiction.[55,56] New information from these imaging technologies may help research scientists formulate and design time sensitive, interventional molecular therapies targeted to the treatment or prevention of addiction.

Research efforts in molecular imaging are just beginning to explore supraspinal responses to painful stimuli and the analgesic reward. The findings from these studies will provide much needed information to improve the care and treatment of patients suffering from chronic pain.[57]

As more is learned about the mechanisms of addiction and the interactions between different neurotransmitter systems, genetics, and environmental factors, it will become possible to expand our treatment options and tailor them for the individual. The combined use of molecular imaging and the advent of personalized medicine accompanied by targeted "smart-drugs" will greatly improve the current treatment paradigm. The new paradigm will not only affect treatment of addiction, but of many other chronic diseases as well. These, and other cutting edge technologies (eg, nanomedicine and nanosurgery), coupled with traditional prevention campaigns and patient education, may dramatically reduce the number of addicts and reduce the burden of addiction for everyone in the future.[38,39]

Clinical Interpretation

For the pain management clinician, the information presented here underscores addiction as a chronic disease of the brain, which has been proven using evidence from numerous PET and fMRI molecular imaging studies. Images have demonstrated brain atrophy in addicted individuals compared to those of a control group. Strokes have been demonstrated in cocaine addicts beyond normal occurrence. In studies of all drugs of abuse, a similar pattern of reduced brain activity is exhibited indicating a reduced number of D2 receptors and/or an increase in endogenous dopamine, directly affecting the reward pathway of the brain. Drug associated memory cues, such as being in or simply seeing the environment in which the drug was used or seeing drug paraphernalia, with no active administration of the drug of abuse, can elicit the same physiologic effects as if the drug were actually administered. These insights provide researchers with the physiologic basis of addiction, information that is necessary in order to research and develop novel therapies or preventive interventions. With advancements in tracer development, molecular imaging research will advance to include pain and analgesic reward offering potential for new and non-addictive pain therapies.

Review the complete list of References and Resource Links of Interest at *www.EmergingSolutionsinPain.com — CE Education — Knowledge Series III* and select the Schlyer monograph from the list)

Addendum

2009 Update: Neuroimaging: Interpreting Addiction

Brain research in addiction continues in order to better understand the multiple mechanisms involved and to motivate scientists toward the discovery of prevention or a cure. The association between impulsivity and addiction is currently a topic of intense research interest.[1] Previously, imaging studies have shown that drug abusers have marked decreases in dopamine release and in dopamine (D2) receptors. A recently published review by Volkow, et al., describes positron emission tomography (PET) scan results that demonstrate a reduction in dopamine activity, linked to the decrease to prefrontal and striatal deregulation, which in turn leads to compulsive, impulsive and unintentional behaviors. This loss of control typically observed in an addicted individual can be triggered by a conditional drug-related cue or by use of the drug itself.[2]

Much of the progress that has taken place in neuroimaging of addiction is attributed to the PET radiopharmaceutical agents or radioligands that bind to target receptors, like D2. Carbon-11 and fluorine-18 tagged ligands are now used to map adenosine receptors: A1, A2A, A2B, and A3.[3] Recent findings show that the neuromodulator adenosine plays a role in reward-related behavior, both as an independent mediator and via interactions of adenosine receptors (A2A) with other receptors. A2A receptors are found clustered with dopamine and glutamate receptors and are ideally situated to influence the signaling of neurotransmitters relevant in neuronal responses and plasticity that underlie the development of drug-taking and drug-seeking behaviors.[4] Williams and Adinoff published results from preclinical studies that suggest acetylcholine, another neuromodulator, exerts a myriad of effects on the addictive process and that persistent changes to the cholinergic system following chronic drug use may exacerbate the risk of relapse during recovery.[5] A radioligand, 3-(4-(3-[(18) F] fluoropropylthio)-1,2,5-thiadiazol-3-yl)-1-methyl-1,2,5,6-tetrahydropyridine, termed, [F-18] FP-TZTP or an earlier generation can be used for this purpose, as [F-18] FP TZTP is an agonist with specificity toward subtype 2 of muscarinic acetylcholine (M2) receptors.[6] A new radioligand, [C-11] MeJDTic, is now reportedly used to image kappa-opioid receptors in vivo.[7] As novel radioligand tracers are developed for targeting various receptors, advancements in understanding the role that these assorted receptors play by themselves, and in concert with other receptors, the disease of addiction will be become clearer.

Other medical imaging advances for use in addiction research include higher Tesla MRI scanners (ie, 3 to 7 Tesla) coupled with magnetic resonance spectroscopy (MRS), use of preclinical animal imaging to model human drug abuse, and application of combined techniques and modalities, such as integration of diffusion tensor imaging (DTI), magnetoencephalography (MEG), and functional magnetic resonance imaging (fMRI) data. These combined technologies can provide tremendous information about neuronal pathways, identification and differentiation of chemicals and their abundance or lack of it, and rates of perfusion with highest spatial and temporal resolution. These data are then correlated with behavioral outcomes.[8]

Advances continue in other non-imaging research areas such as epigenetics. Published results from an epigenetic study concluded that first-trimester prenatal exposure to famine (1944-1945 Dutch Hunger Winter) appears to be associated with a greater incidence of addiction. The study confirms the adverse influence of severe malnutrition on brain development and maturation and confirms the influence of perinatal insults on mental health in later life.[9]

Although nanospheres are currently administered for use in humans via novel drug design, nanoneuroscience remains in its infancy. Animal experimentation with nanomedicine has shed light on the inherent risks associated with its use. Thermoregulation and cellular damage have been observed. Therapeutic interventional nanodots or nanobots for use in CNS disease are still considered a distant solution until further research elucidates their true risk in human application.[10]

With each passing year and with the advent of each new technology, addictive disease appears less formidable and not quite as mysterious. As medical knowledge is acquired, addicts advance one step closer to improved mental health. The ultimate goal is that addiction may one day become a preventable disease.

References for Addendum

1. Winstanley CA. The orbitofrontal cortex, impulsivity, and addiction: Probing orbitofrontal dysfunction at the neural, neurochemical, and molecular level. *Ann N Y Acad Sci.* 2007,1121:639-655.
2. Volkow ND, Fowler JS, Wang GJ, Baler R, Telang F. Imaging dopamine's role in drug abuse and addiction. *Neuropharmacology.* 2009;56 Suppl 1:3-8.
3. Ishiwata K, Kimura Y, J. de Vries E, Elsinga PH. PET tracers for Mapping Adenosine Receptors as Probes for Diagnosis of CNS Disorders. *Cent Nerv Syst Agents Med Chem.* 2007,7(21):57-77.
4. Brown RM, Short JL. Adenosine A(2A) receptors and their role in drug addiction. *J Pharm Pharmacol.* 2008;60(11):1409-1430.
5. Williams MJ, Adinoff B. The role of acetylcholine in cocaine addiction. *Neuropsychopharmacology.* 2008;33(8):1779-1797.
6. van Oosten EM, Wilson AA, Stephenson KA, Mamo DC, Pollock BG, et al. An improved radiosynthesis of the muscarinic M2 radiopharmaceutical, [(18)F]FP-TZTP. *Appl Radiat Isot.* 2008 Dec 25. [Epub ahead of print].
7. Poisnel G, Oueslati F, Dhilly M, Delamare J, Perrio C, et al. [11C]-MeJDTic: A novel radioligand for kappa-opioid receptor positron emission tomography imaging. *Nucl Med Biol.* 2008;35(5):561-569.
8. Nader MA, Czoty PW. Brain imaging in nonhuman primates: Insights into drug addiction. *ILAR Journal.* 2008,7:89-102.
9. Franzek EJ, Sprangers N, Janssens AC, Van Duijn CM, Van De Wetering BJ. Prenatal exposure to the 1944-45 Dutch 'hunger winter' and addiction later in life. *Addiction.* 2008,103(3):433-438.
10. Sharma HS. Nanoneuroscience: Emerging concepts on nanoneurotoxicity and nanoneuroprotection. Editorial. *Nanomedicine.* 2007,2:753-758.