

CNS SPECTRUMS®

THE INTERNATIONAL JOURNAL OF NEUROPSYCHIATRIC MEDICINE

CME PSYCHCAST™

BEST PRACTICES IN ADULT ADHD: SPECIAL CONSIDERATIONS

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CME 1

ABSTRACT

The treatment of adult attention-deficit/hyperactivity disorder (ADHD) is not without potential complications. Concerns exist regarding the cardiovascular safety of ADHD medications. The vulnerability of ADHD patients to cardiovascular problems may be unclear during diagnosis, and can require close attention by the physician before and during treatment. ADHD may be obscured by the presence of mimics, conditions responsible for symptoms or impairments that look like, and may be confused for, ADHD. Mimics can divert attention away from the real underlying disorder and can compel a physician to prescribe unnecessary treatment. There is also concern about the potential for diversion and misuse of ADHD medications. To avoid these possible complications, clinicians must screen patients for preexisting cardiovascular events and family history of cardiac dysfunction. The American Heart Association has recently published guidelines for cardiovascular monitoring for children and adolescents who are receiving psychostimulant therapy. To rule out the possibility of medical or psychiatric mimics, diagnosis must be thoughtful and thorough. Neuropsychiatric testing may help identify certain mimic conditions. Though it appears that rates of stimulant abuse are not higher among treated ADHD patients compared to the general population, physicians must be vigilant about the possibility of misuse among their patients.

In the final segment of a 3-part Expert Roundtable PsychCast™ series on *Best Practices in Adult ADHD*, Lenard A. Adler, MD, offers an introduction to the special considerations in treating adult ADHD; Jeffrey H. Newcorn, MD, reviews issues in safety and cardiovascular risk for ADHD patients; Thomas J. Spencer, MD, reviews data on the diversion and misuse of stimulant medications; and Mark A. Stein, PhD, discusses conditions that mimic or present co-morbid with ADHD as well as neuropsychological testing.



This activity is jointly sponsored by the Mount Sinai School of Medicine and MBL Communications, Inc.



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Release date: November 2008

Termination date: November 30, 2010

Estimated time to complete this activity: 1 hour

Acknowledgment of Commercial Support

Funding for this activity has been provided by an educational grant from Shire Pharmaceuticals Inc.

CME Course Director

This activity has been peer reviewed and approved by James C.-Y. Chou, MD, associate professor of psychiatry at the Mount Sinai School of Medicine. Review Date: October 2, 2008.

Faculty Affiliations

Lenard A. Adler, MD, is associate professor of psychiatry and child and adolescent psychiatry, and director of the Adult ADHD Program, both at the New York University Langone School of Medicine. Jeffrey H. Newcorn, MD, is associate professor in the Department of Psychiatry at the Mount Sinai School of Medicine in New York City. Thomas J. Spencer, MD, is associate professor of psychiatry at Harvard Medical School and associate director of the Clinical and Research Program in Pediatric Psychopharmacology at Massachusetts General Hospital in Boston. Mark A. Stein, PhD, is professor in the Department of Psychiatry at the University of Illinois in Chicago and director of the Adult ADHD Clinic.

Faculty Disclosure Policy Statement

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Faculty Disclosures

Dr. Adler is a consultant to and on the advisory boards of Abbott, Cephalon, Cortex, Eli Lilly, Novartis, Ortho-McNeil, Janssen, Johnson and Johnson, Merck, New River, Organon, Pfizer, Psychogenics, sanofi-aventis, and Shire; is on the speaker's bureaus of Eli Lilly and Shire; and receives grant/research support from Abbott, Bristol-Myers Squibb, Cephalon, Cortex, Eli Lilly, Janssen, Johnson and Johnson, Merck, National Institute of Drug Abuse, New River, Novartis, Ortho-McNeil, Pfizer, and Shire.

Dr. Newcorn is a consultant to Abbott, Biobehavioral Diagnostics, Eli Lilly, Lupin, Novartis, Ortho-McNeil, Psychogenics, sanofi-aventis, and Shire; and receives research support from Eli Lilly and Ortho-McNeil.

Dr. Spencer is a speaker for Eli Lilly, GlaxoSmithKline, Janssen, Novartis, Ortho-McNeil, and Shire; is on the advisory boards of Cephalon, Eli Lilly, GlaxoSmithKline, Janssen, Novartis, Ortho-McNeil, Pfizer, and Shire; and receives research support from Cephalon, Eli Lilly, GlaxoSmithKline, Janssen, National Institute of Mental Health, Novartis, Ortho-McNeil, Pfizer, and Shire.

Dr. Stein is a consultant/advisor to Abbott, Novartis, and Pfizer; is a speaker for Novartis and Ortho-McNeil; and receives research support from Eli Lilly, National Institute of Mental Health, Organon, Ortho-McNeil, and Pfizer.

Peer Reviewer

James C.-Y. Chou, MD, has received honoraria from AstraZeneca, Bristol-Myers Squibb, Eli Lilly, Janssen, and Pfizer.

Learning Objectives

- Discuss the potential cardiovascular risks of ADHD treatments and appropriate screening methods to identify at-risk patients.
- Distinguish between abuse, misuse, and diversion of medications, and discuss how these problems pertain to patients with ADHD.
- Review the conditions that tend to simulate ADHD and methods of ruling out these conditions at the early stages of diagnosis.

Statement of Need and Purpose

There are numerous reasons to treat attention-deficit/hyperactivity disorder in adults, including to minimize impairment from core symptoms, to alter the course of co-morbid disorders, and to prevent deterioration. However, the treatment of adult ADHD is not without potential complications. While ADHD medications are generally considered to be safe, concerns exist regarding the cardiovascular safety of certain medications. The issue of sudden cardiac death is all the more important in adults treated with stimulants, as adults are generally thought to be more at risk for underlying cardiovascular illness, including hypertension, arrhythmia and cardiac ischemia. The vulnerability of ADHD patients to cardiovascular problems require close attention by the physician before and during treatment. Other considerations in the treatment of adult ADHD include the potential for abuse, misuse, or diversion of ADHD medications and the presence of medical or psychiatric conditions that mimic ADHD. The diagnosis of adult ADHD is predicated on certainty that the symptoms of inattention and/or hyperactivity-impulsivity are not better explained by another disorder. This requirement is often thought to focus on co-morbid mental health disorders, such as mood disorders or substance use disorders. However, several medical conditions, such as thyroid disorders, obesity, sleep disorders, and seizure disorders can also present with similar symptoms. It is important for clinicians to be educated on the latest methods and guidelines used to avoid such complications, such as appropriate screening for preexisting cardiovascular events and family history of cardiac dysfunction; thorough diagnoses to rule out medical or psychiatric mimics; and appropriate care and monitoring of patients at risk for abuse, misuse, or diversion of their medications.

Target Audience

This activity is designed to meet the educational needs of primary care physicians and psychiatrists.

Accreditation Statement

This activity has been planned and implemented in accordance with the Essentials and Standards of the Accreditation Council for Continuing Medical Education (ACCME) through the joint sponsorship of the Mount Sinai School of Medicine and MBL Communications, Inc. The Mount Sinai School of Medicine is accredited by the ACCME to provide continuing medical education for physicians.



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Credit Designation

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To Receive Credit for this Activity

Listen to the Expert Roundtable PsychCast™, reflect on the information presented, and complete the CME posttest and evaluation. To obtain credit, you should score 70% or better. Early submission of this posttest is encouraged. Please submit this posttest by November 1, 2010 to be eligible for credit.



CARDIOVASCULAR SAFETY OF ADHD MEDICATION TREATMENTS

By Jeffrey H. Newcorn, MD

SLIDE LIBRARY

SLIDE 1

Estimated Reporting Rates (1992–2005) Pediatric Sudden Death (≤ 18 Years of Age)^{†-3}

Drug	All Age Groups	Pediatric Age Group 0–18 Years		
	Total Prescriptions ¹	Pediatric Exposure* ¹	N ^{†,1}	Reporting Rate per 100,000 p-y
Methylphenidate	110,734,000	7,127,432	11	0.2
Amphetamine and Dextroamphetamine	70,699,000	3,817,929	13	0.3
Atomoxetine	9,419,000	601,246	3	0.5
Apparently normal children—no medication ³				1–1.5

* Total person-years times the percentage of drug appearances in the pediatric subgroup population.

† Drugs include both branded and generic; all formulations available during respective time periods.

N=sudden death cases identified in FDA AERS database received from January 1992 through February 2005; p-y=person years.

SLIDE 2

Screening for Cardiac Risk: American Heart Association Guidelines^{4,5}

Medical history, including:

- Personal, congenital, or acquired cardiac disease history
- Family history of, or premature, cardiac disease (<30 years of age)
- History of palpitations, chest pain, syncope, seizures, post-exercise symptoms
- Medication history (including OTC formulations)

Screening physical exam

- Monitor BP and pulse pre- and post-treatment

Pediatrics:

- Baseline EKG not required, but low threshold for obtaining EKG is recommended.
- Holter, ECHO in at-risk cases, as required

Adults:

- No established guidelines for work-up
- Many adults get routine baseline EKGs
- Careful attention to baseline pulse and BP

Subspecialty evaluation for:

- Suspicion of cardiovascular defect (eg, idiopathic hypertrophic sub-aortic stenosis)
- Individual or family history suggesting elevated risk

OTC=over the counter; BP=blood pressure; EKG=electrocardiogram; ECHO=echocardiogram.

References

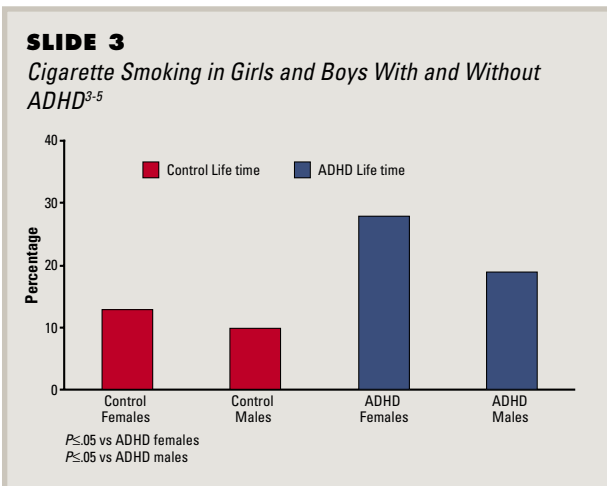
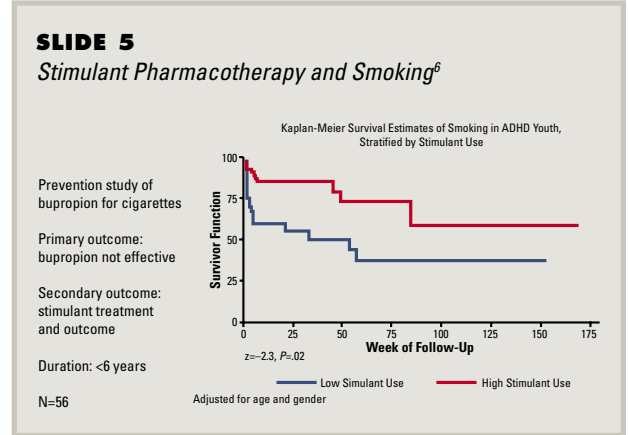
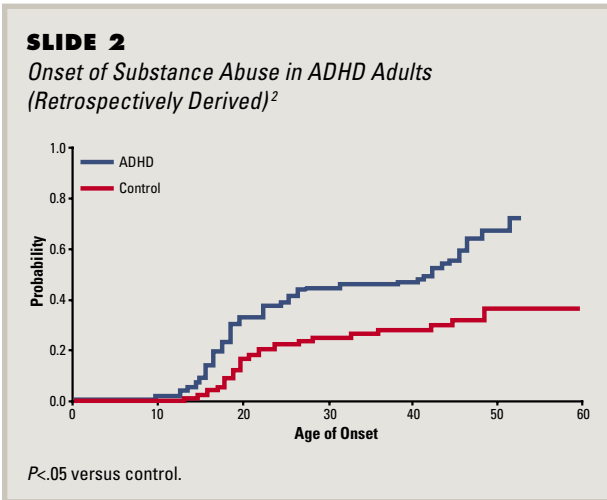
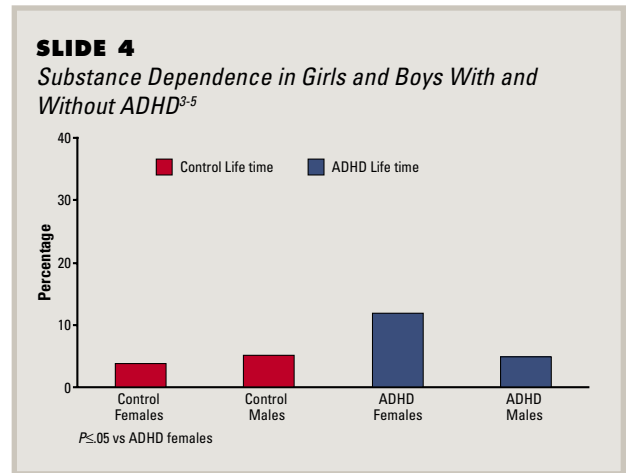
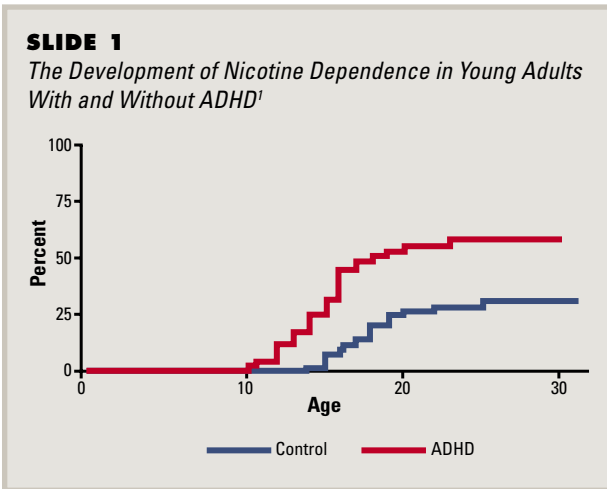
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ADULT ADHD: *DIVERSION AND MISUSE OF MEDICATIONS*

By Thomas J. Spencer, MD

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SLIDE 6
Systematic Review of Misuse and Diversion Literature: Methods⁷

2008 literature review evaluated stimulant misuse and diversion in individuals with and without ADHD

Search terms included: misuse, diversion, stimulants, illicit use, and ADHD medications

Study questions:

- What is the rate of misuse of ADHD stimulant medications in adolescents and young adults with and without ADHD?
- What is the rate of diversion of ADHD stimulant medications?
- Who is at greatest risk and in what context do misuse and diversion occur?

SLIDE 7

Systematic Review of Misuse and Diversion Literature: Results⁷

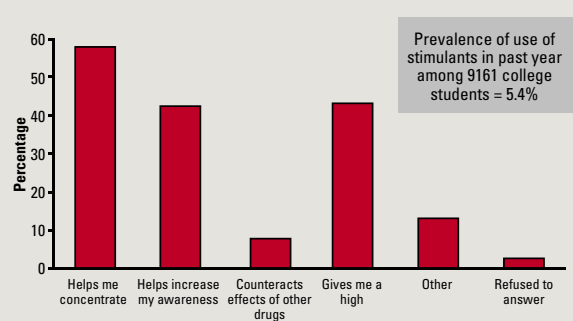
- 21 studies representing 113,104 subjects were identified
- Most studies included young adults exclusively (n=12) or as part of a mixed-age population (n=6)
 - Most studies were surveys (n=19) with data ascertained from schools or colleges (n=17)

- Past-year prevalence of stimulant misuse
- 5% to 9% in adolescents (grade/high school)
 - 5% to 35% in young adults (college-age)

- Lifetime prevalence of diversion
- 16% to 29%

SLIDE 10

Misuse Does Not Always Equal Abuse: What Motivates Undergraduates at One Institution to Use Stimulants Illicitly?⁸



SLIDE 8

Systematic Review: Who Is at Risk for Misuse and Diversion?⁷

- High-risk characteristics
- White race
 - Fraternity/sorority membership
 - Lower grade point averages
 - Access to immediate-release compared to extended-release preparations
 - Reported ADHD symptoms

- Gender differences in misuse vary by study
- Misuse may be higher in white and Hispanic individuals
- No studies reported a relationship to social class

SLIDE 11

Misuse of Stimulants in the General Population: College Students⁸

Author (Year)	Population	Drug Illicitly Used	Percentage Used in the Past Year
McCabe 2005	College students overall	Stimulants	4.1
	From schools considered:		
	• Most competitive		5.9
	• Competitive		4.5
	• Less competitive		1.3

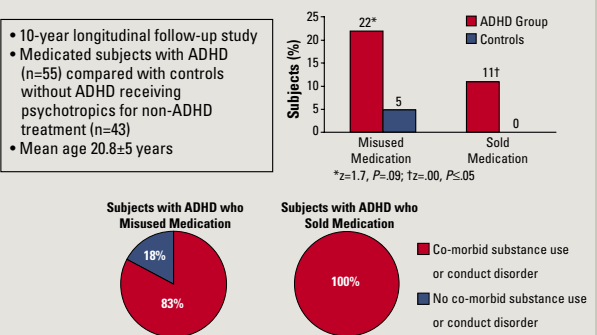
SLIDE 9

Systematic Review: Why Are Stimulants Misused and Diverted?⁷

- To concentrate
- To improve alertness or pay attention
- To study or improve grades
- To “get high” or for “partying”
- To experiment
- Other motivation

SLIDE 12

Substance Use and Conduct Disorders in Patients With ADHD Who Misuse and Divert Medication⁹



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MEDICAL MIMICS AND DIFFERENTIAL DIAGNOSIS IN ADULT ADHD

By Mark A. Stein, PhD

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SLIDE 1

Mimics from A (anemia) to V (vision loss)¹

Medical disorders (chronic disease, hearing impairment, sleep disorder)

Medications (eg, steroids, anticonvulsants, antihistamines, caffeine, nicotine)

Neurologic disorder (brain injury, seizure disorder)

Endocrine/metabolic/genetic disorders (obesity, metabolic syndrome, thyroid disease)

Developmental disorders (learning disorder, MR)

Psychiatric disorders (mood disorders, OCD)

MR=mental retardation; OCD=obsessive-compulsive disorder.

SLIDE 2

Diagnostic Tools

History (current and childhood)

Symptom and impairment ratings

Physical exam and vital signs

Laboratory tests (when indicated, not routine)

- Psychological or neuropsychological
- Consultations with subspecialists
- Electroencephalography, magnetic resonance imaging
- Audiogram
- Thyroid function tests, complete blood count

SLIDE 3

Five Tests That Discriminated ADHD From Controls (33 Studies)²

Wechsler Adult Intelligence Scale (Digit Symbol, Arithmetic)

Continuous Performance Test (vigilance, sustained attention)

Stroop (a task of inhibition during color-word task)

Trail Making Test (visual search and perceptual motor speed)

Verbal Fluency (phonological associations and category fluency)

SLIDE 4

Functional Neuropsychological Domains and Corresponding Test Instruments²

<i>Functional Domain</i>	<i>Description</i>	<i>Tests</i>
Verbal intelligence	Verbal abilities; education-mediated knowledge	WAIS-R Similarities, information, vocabulary; reading
Executive functions	Planning and controlling of actions	Wisconsin Card Sorting Test; Tower of Hanoi
Fluency	Productivity; creativity	Controlled Oral Word Association Test; design fluency
Visual-figural problem solving	Logical structuring, problem solving, visual	WAIS-R Block Design, picture completion, picture arrangement; Rey-Osterrieth Complex Figure (accuracy; organization); Embedded Figures Test
Abstract problem solving; working memory	Logical problem solving without action	WAIS-R arithmetic; Auditory Consonant Trigrams
Simple attention	Simple attention tasks; mostly visual-motor processing; mostly speed measures	Digit span (forewards); freedom-from-distractability (WAIS-R); Stroop Word, Color; Trail Making Test A; Visual CPT reaction time; 3RT Simple; Wechsler Memory Scale-Attention, Target Orientation Test

SLIDE 5

Neuropsychological Testing Summary³

Neuropsychological impairments similar to those seen in children

- Processing speed
- Working memory

Specificity poor for diagnosis of ADHD (effect sizes low to medium vs. controls (Schoechlin and Engel, 2005))

Helpful in quantifying severity and range of impairments

- Students who need accommodations
- Inattentive Type

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BEST PRACTICES IN ADULT ADHD: SPECIAL CONSIDERATIONS

CME QUESTIONS

1. **All of the following statements regarding cardiovascular monitoring of stimulant treatments in individuals with attention-deficit/hyperactivity disorder (ADHD), are true except:**
 - A. It is essential to obtain pre-treatment pulse and blood pressure in children as well as adults, and monitor these parameters over the course of treatment
 - B. It is essential to obtain a pre-treatment history of risk factors for acute cardiac events
 - C. It is essential to obtain a pre-treatment electrocardiogram (EKG)
 - D. It is essential to present patients and relevant family members with accurate information regarding the nature and extent of cardiovascular risk associated with treatment
2. **Reasons to consider obtaining an EKG in youth with ADHD might include which of the following?**
 - A. History of a cardiac murmur
 - B. The patient engages in strenuous physical exercises
 - C. There is a family history of coronary artery disease at a young age
 - D. All of the above
 - E. None of the above
3. **In discussing cardiovascular safety of treatments for ADHD, it is appropriate to include information about which of the following?**
 - A. The risk of untoward cardiac events in the general population
 - B. The potential benefits of medication treatments for ADHD
 - C. The way that risk will be assessed prior to treatment and monitored over the course of treatment
 - D. The presumption that prevalence estimates for a particular adverse event derived from voluntary, post-marketing reports likely constitute an under-estimate of the phenomenon
 - E. All of the above
4. **Increased risk of psychopathology in ADHD includes:**
 - A. Substance use but not smoking
 - B. Substance use in boys and smoking in girls
 - C. Substance use in girls and smoking in boys
 - D. Smoking but not substance abuse
 - E. Substance use and smoking in both boys and girls
5. **A review of studies of clinical exposure to stimulants in children with ADHD revealed (on average):**
 - A. Stimulant exposure was associated with increased substance abuse
 - B. Stimulant exposure was associated with decreased substance abuse
 - C. Stimulant exposure was not associated with substance abuse
6. **Reasons individuals misuse stimulants include:**
 - A. Only to get high
 - B. Only to increase concentration
 - C. Only to stay awake
 - D. All of the above
7. **All of the following can mimic ADHD, except:**
 - A. Thyroid disease
 - B. Sleep deprivation
 - C. Mental retardation
 - D. ADHD not otherwise specified
8. **Neuropsychological testing can:**
 - A. Identify co-morbid learning disorders
 - B. Identify mimic conditions
 - C. Determine the need for accommodations during testing
 - D. All of the above

REGISTRATION

NOVEMBER 2008 CME POSTTEST



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ANSWER FORM

Expert Roundtable PsychCast™ – Best Practices in Adult ADHD: *Special Considerations*

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Please circle your answers

1. A B C D 2. A B C D E 3. A B C D E 4. A B C D E 5. A B C 6. A B C D 7. A B C D 8. A B C D

EVALUATION SECTION (please provide the information below and print clearly)

1. Was this activity relevant to your practice? Yes No

2. Were the following objectives met?

A. Discuss the potential cardiovascular risks of ADHD treatments and appropriate screening methods to identify at-risk patients. Yes No

B. Distinguish between abuse, misuse, and diversion of medications, and discuss how these problems pertain to patients with ADHD. Yes No

C. Review the conditions that tend to simulate ADHD and methods of ruling out these conditions at the early stages of diagnosis. Yes No

3. Did this activity increase your knowledge and/or skills in delivering patient care? Yes No

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If you answered yes, what change(s) do you intend to make in your practice? _____

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