QT or not QT - is that the question?

METHADONE & QTc PROLONGATION: CLINICAL AND OTHER IMPLICATIONS

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Alan A. Wartenberg, MD
Disclosures

• Alan A. Wartenberg, MD has no financial relationships to disclose.

The contents of this activity may include discussion of off label or investigative drug uses. The faculty is aware that it is their responsibility to disclose this information.
Stephen A. Wyatt, DO
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All faculty have been advised that any recommendations involving clinical medicine must be based on evidence that is accepted within the profession of medicine as adequate justification for their indications and contraindications in the care of patients. All scientific research referred to, reported, or used in the presentation must conform to the generally accepted standards of experimental design, data collection, and analysis. Speakers must inform the learners if their presentation will include discussion of unlabeled/investigational use of commercial products.
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Released Date: June 22, 2016
Expiration Date: June 22, 2019
System Requirements

• In order to complete this online module you will need Adobe Reader. To install for free click the link below:
Target Audience

• The overarching goal of PCSS-MAT is to make available the most effective medication-assisted treatments to serve patients in a variety of settings, including primary care, psychiatric care, and pain management settings.
Educational Objectives

At the conclusion of this activity participants should be able to:

• Recognize the identification and development of a prolonged QT interval.

• Review the screening of a patient at risk for the development of a dangerous QT prolongation.

▪ Assess how dosing can play a factor in the development of a prolonged QT interval
CASE PRESENTATION

- KB - 38 y/o WM, 20 y hx of opiate abuse, transferred from MMTP at 300 mg - “they wouldn’t give me higher dose!!”
- Was using 2 grams heroin/day, occ cocaine - both IV, denied any PMH, cardiac hx
- Family hx - father on MMTP for 25 y in NYC, was on 500 mg/d - died suddenly
- Cardiac and general PE unremarkable
CLINICAL COURSE

- Methadone levels - 265 peak, 120 trough
- VS, pupils, MSE showed w/d at both p/t
- Dose increased 20 mg q 5-10 days
- At 400 mg - 510 peak, 360 trough - still sx of w/d at trough
- 600 mg - 780 peak/513 trough - normal eval at both p/t
CLINICAL COURSE (CONT’D)

- 1 month at 600 mg, patient had seizure and seen in ER - was in V. tach, TdP
- Treated with countershock, converted, placed on beta blockers
- Had 3 recurrences in ER
- Treated with overdrive pacing, alkalinization with NaHCO3
- Methadone level was 674 ng/ml
EKG and Subsequent Course

- QTc 612 msec
- Older sib with no cardiac hx had QTc of 524 msec
- ICD & Pacemaker inserted
- Methadone gradually tapered to 430 mg, QTc reduced to 480 msec
- Pt continued to c/o “methadone not holding him”
- Dose gradually increased to 500 mg with QTc of 500 msec, but not triggering ICD, clinically “adequate”
The Circle from Bedside to Bench to Bedside in Research on the Long-QT Syndrome

Electrocardiographic Tracings Obtained Soon after Hospitalization (Panel A) and on Day 6 of Hospitalization (Panel B)

Family Tree and Electrocardiographic Findings of the Patient and Her Family
# Common Forms of the Long-QT Syndrome

<table>
<thead>
<tr>
<th>Variable</th>
<th>LQT1</th>
<th>Genetic Subtype</th>
<th>LQT3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Disease-associated gene</td>
<td>KCNQ1</td>
<td>KCNH2</td>
<td>SCN5A</td>
</tr>
<tr>
<td>In vitro effect</td>
<td>Decreased I&lt;sub&gt;Ks&lt;/sub&gt;</td>
<td>Decreased I&lt;sub&gt;Kr&lt;/sub&gt;</td>
<td>Increased plateau I&lt;sub&gt;Na&lt;/sub&gt;</td>
</tr>
<tr>
<td>Setting of arrhythmia†</td>
<td>Emotional or physical stress, swimming, diving</td>
<td>Emotional or physical stress, sudden loud noise</td>
<td>Rest, sleep</td>
</tr>
<tr>
<td>Typical resting ECG‡</td>
<td>Broad T wave</td>
<td>Low-amplitude T wave with notching</td>
<td>Long isoelectric ST segment</td>
</tr>
<tr>
<td>ECG at onset of arrhythmia§</td>
<td>No pause</td>
<td>Pause</td>
<td>Not established</td>
</tr>
<tr>
<td>QT change with exercise</td>
<td>Failure to shorten</td>
<td>Normal</td>
<td>Supranormal</td>
</tr>
<tr>
<td>QT shortening with mexiletine¶</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>Clinical response to beta-blockers</td>
<td>Yes</td>
<td>Less than LQT1 response</td>
<td>Uncertain</td>
</tr>
</tbody>
</table>

* ECG denotes electrocardiogram, I<sub>Kr</sub> the rapid component of the delayed rectifier current, I<sub>Ks</sub> the slow component of the cardiac delayed rectifier current, and I<sub>Na</sub> the cardiac sodium current.

† Data are from Schwartz et al.⁴

‡ These are typical patterns, but exceptions and variants are well recognized. Data are from Moss et al.⁵

§ Data are from Tan et al.⁶

¶ Data are from Schwartz et al.⁷

‖ Data are from Priori et al.⁸
## Guidelines for Management of the Long-QT Syndrome

<table>
<thead>
<tr>
<th>Recommendation</th>
<th>Level of Evidence</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>No participation in competitive sports</td>
<td>I</td>
<td>Includes patients with the diagnosis established by means of genetic testing only</td>
</tr>
<tr>
<td>Beta-blockers</td>
<td>I</td>
<td>For patients who have QTc-interval prolongation (&gt;460 msec in women and &gt;440 msec in men)</td>
</tr>
<tr>
<td></td>
<td>IIa</td>
<td>For patients with a normal QTc interval</td>
</tr>
<tr>
<td>Implantable cardioverter–defibrillator</td>
<td>I</td>
<td>For survivors of cardiac arrest</td>
</tr>
<tr>
<td></td>
<td>IIa</td>
<td>For patients with syncope while receiving beta-blockers</td>
</tr>
<tr>
<td></td>
<td>IIb</td>
<td>For primary prevention in patients with characteristics that suggest high risk; these include LQT2, LQT3, and QTc interval &gt;500 msec‡</td>
</tr>
</tbody>
</table>

* Data are from the American College of Cardiology, the American Heart Association, and the European Society of Cardiology, in collaboration with the European Heart Rhythm Association and the Heart Rhythm Society. Guidelines are adapted from Zipes et al.⁵²

† Levels of evidence are as follows: I, conditions for which there is evidence or general agreement, or both, that a given procedure or treatment is beneficial, useful, and effective; II, conditions for which there is conflicting evidence or divergence of opinion, or both, about the usefulness and efficacy of a procedure or treatment; IIa, conditions for which the weight of evidence or opinion is in favor of usefulness and efficacy; and IIb, conditions for which the usefulness and efficacy are less well established by evidence or opinion.

‡ Other indicators of risk may include the specific site of mutation¹⁴ and the postpartum period.¹⁸

2002 - KRANTZ PUBLISHES IN ANNALS ON QTc

- Dose-related, most cases >400 mg per day, but 2 patients on < 150 mg/d
- Curve showed very direct relationship between dose and QTc
- No deaths associated

NIH REPORTS >500% INCREASE IN METHADONE-RELATED DEATHS BETWEEN 1995-2005

OVERWHELMING MAJORITY ARE IN PAIN PROGRAMS OR DIVERSION

LAAM ASSOCIATED WITH SIGNIFICANT QTc INTERVAL PROLONGATION

LAAM PULLED FROM MARKET BY DRUG COMPANY FOR QTc ISSUES
Comparison of the mean rate of Bazett's corrected QT interval (errors bars indicate confidence intervals)
Percentage of study population exceeding the cutoff value for Bazett's corrected QT of 470 milliseconds for males and 490 milliseconds for females at the different "on-drug" points in the study.
### Table. Changes in Corrected QT Interval after 2 Months of Methadone Treatment*

<table>
<thead>
<tr>
<th>Variable</th>
<th>Patients</th>
<th>Baseline QTc</th>
<th>Follow-up QTc</th>
<th>Difference</th>
<th>P Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>All patients</td>
<td>132</td>
<td>418</td>
<td>428</td>
<td>10.8</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Sex</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>42</td>
<td>423</td>
<td>429</td>
<td>5.6</td>
<td>0.04</td>
</tr>
<tr>
<td>Male</td>
<td>90</td>
<td>415</td>
<td>428</td>
<td>13.2</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Heart rate</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt;60 beats/min</td>
<td>81</td>
<td>420</td>
<td>431</td>
<td>10.4</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>≤60 beats/min</td>
<td>51</td>
<td>413</td>
<td>425</td>
<td>11.5</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Methadone dose</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0–59 mg</td>
<td>39</td>
<td>414</td>
<td>424</td>
<td>11.1</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>60–109 mg</td>
<td>78</td>
<td>420</td>
<td>431</td>
<td>10.2</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>110–150 mg</td>
<td>15</td>
<td>414</td>
<td>427</td>
<td>13.2</td>
<td>0.04</td>
</tr>
</tbody>
</table>

* QTc = corrected QT interval.

Methadone Use for Pain Control May Result in Death and Life-Threatening Changes in Breathing and Heart Beat

The issues described in this communication have been addressed in product labeling, please see Drugs@FDA.

FDA has received reports of death and life-threatening side effects in patients taking methadone. These deaths and life-threatening side effects have occurred in patients newly starting methadone for pain control and in patients who have switched to methadone after being treated for pain with other strong narcotic pain relievers. Methadone can cause slow or shallow breathing and dangerous changes in heart beat that may not be felt by the patient.

FDA ADVISORY, 2006

FDA Alert - Methadone Life Threatening Reactions  FDA Public Health Advisory 11/27/06
FDA ALERT [11/2006]:
Death, Narcotic Overdose, and Serious Cardiac Arrhythmias

FDA has reviewed reports of death and life-threatening side effects such as slowed or stopped breathing, and dangerous changes in heart beat in patients receiving methadone. These serious side effects may occur because methadone may build up in the body to a toxic level if it is taken too often, if the amount taken is too high, or if it is taken with certain other medicines or supplements. Methadone has specific toxic effects on the heart (QT prolongation and Torsades de Pointes). Physicians prescribing methadone should be familiar with methadone’s toxicities and unique pharmacologic properties. Methadone’s elimination half-life (8-59 hours) is longer than its duration of analgesic action (4-8 hours). Methadone doses for pain should be carefully selected and slowly titrated to analgesic effect even in patients who are opioid-tolerant. Physicians should closely monitor patients when converting them from other opioids and changing the methadone dose, and thoroughly instruct patients how to take methadone. Healthcare professionals should tell patients to take no more methadone than has been prescribed without first talking to their physician.

This information reflects FDA’s current analysis of data available to FDA concerning this drug. FDA intends to update this sheet when additional information or analyses become available.
• Admission EKG
• Repeat EKG after induction (4-6 weeks)
• EKG for dose > 150 mg and for “dose increases at periodic intervals
• “Frequent monitoring” for those with QTc> 450 msec, review of other meds
• Same for > 500 msec with “consideration of dose reduction,” review of other meds
POSSIBLE BENEFITS

- “MEDICALIZATION” OF TREATMENT
- SAFETY ISSUES, IDENTIFICATION OF PT’S AT RISK - EARLY REFERRAL
- REASSURANCE OF PATIENTS AND THEIR FAMILIES, PUBLIC
- IDENTIFICATION OF THOSE ON OTHER POTENTIAL QTc AGENTS
- COORDINATION OF CARE WITH PCP, PSYCHIATRISTS, CARDIOLOGISTS
- LIABILITY & RISK MANAGEMENT
POSSIBLE RISKS

• EXPENSE OF EKG’S
• BUNDLED CHARGES FOR MEDICAID & PRIVATE PAY
• SELF PAY PATIENT LIMITATIONS
• COST OF REFERRAL TO SPECIALISTS AND CARDIAC WORK-UPS
• INCREASED LIABILITY AND RISK MANAGEMENT ISSUES
FURTHER RISKS

• PATIENTS BEING “SCARED OFF”
• REDUCING METHADONE DOSE AND INCREASING RELAPSES
• COSTING PATIENTS OUT OF METHADONE TREATMENT
• COSTING PROGRAMS OUT OF VIABILITY
POTENTIAL COSTS

- EKG’s - $200 – 400 million/year
- ? COST OF CARDIOLOGISTS, ECHO’S, FURTHER EVALUATION
- ? COST OF INCREASED MEDICAL/RN TIME FOR COORDINATION
- ?? COSTS OF MEDICATION SWITCHES - ESP. BUPRENORPHINE
- MAY INCREASE MED. LIABILITY CASES SIGNIFICANTLY
WHAT CAN WE DO NOW?

- Appropriately screen patients for PMH, FH of palpitations, syncope, sudden death
- Importance of medication screening
- EKG’s selectively on those at high risk
- Proactively discuss issue with referral source prescribers
OTHER QTc PROLONGING MEDS

- MULTIPLE KINDS OF MEDICATIONS
  - ANTIARRHYTMICS
  - MACROLIDE AND QUINOLONE ABX
  - SECOND GENERATION NEUROLEPTICS
  - TRICYCLIC ANTIDEPRESSANTS
  - HIGH DOSE SSRI’S
  - HALOPERIDOL, PHENOPTHIAZINES
  - WWW.qtdrugs.COM
# DRUGS ASSOCIATED WITH TdP

<table>
<thead>
<tr>
<th>Generic Name</th>
<th>Brand Name</th>
<th>Class/Clinical Use</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Amiodarone</td>
<td>Cordarone®</td>
<td>Anti-arrhythmic / abnormal heart rhythm</td>
<td>Females&gt;Males,TdP risk regarded as low</td>
</tr>
<tr>
<td>Amiodarone</td>
<td>Pacerone®</td>
<td>Anti-arrhythmic / abnormal heart rhythm</td>
<td>Females&gt;Males,TdP risk regarded as low</td>
</tr>
<tr>
<td>Arsenic trioxide</td>
<td>Trisenox®</td>
<td>Anti-cancer / Leukemia</td>
<td></td>
</tr>
<tr>
<td>Astemizole</td>
<td>Hismanal®</td>
<td>Antihistamine / Allergic rhinitis</td>
<td>No Longer available in U.S.</td>
</tr>
<tr>
<td>Bepridil</td>
<td>Vascor®</td>
<td>Anti-anginal / heart pain</td>
<td>Females&gt;Males</td>
</tr>
<tr>
<td>Chloroquine</td>
<td>Aralen®</td>
<td>Anti-malarial / malaria infection</td>
<td></td>
</tr>
<tr>
<td>Chlorpromazine</td>
<td>Thorazine®</td>
<td>Anti-psychotic/ Anti-emetic / schizophrenia/ nausea</td>
<td></td>
</tr>
<tr>
<td>Cisapride</td>
<td>Propulsid®</td>
<td>GI stimulant / heartburn</td>
<td>Restricted availability; Females&gt;Males.</td>
</tr>
<tr>
<td>Clarithromycin</td>
<td>Biaxin®</td>
<td>Antibiotic / bacterial infection</td>
<td></td>
</tr>
<tr>
<td>Disopyramide</td>
<td>Norpace®</td>
<td>Anti-arrhythmic / abnormal heart rhythm</td>
<td>Females&gt;Males</td>
</tr>
<tr>
<td>Dofetilide</td>
<td>Tikosyn®</td>
<td>Anti-arrhythmic / abnormal heart rhythm</td>
<td></td>
</tr>
<tr>
<td>Domperidone</td>
<td>Motilium®</td>
<td>Anti-nausea / nausea</td>
<td>Not available in the U.S.</td>
</tr>
<tr>
<td>Droperidol</td>
<td>Inapsine®</td>
<td>Sedative; Anti-nausea / anesthesia adjunct, nausea</td>
<td></td>
</tr>
<tr>
<td>Erythromycin</td>
<td>Erythrocin®</td>
<td>Antibiotic; GI stimulant / bacterial infection; increase GI motility</td>
<td>Females&gt;Males</td>
</tr>
<tr>
<td>Erythromycin</td>
<td>E.E.S.®</td>
<td>Antibiotic; GI stimulant / bacterial infection; increase GI motility</td>
<td>Females&gt;Males</td>
</tr>
</tbody>
</table>
### DRUGS ASSOCIATED WITH TdP, cont.

<table>
<thead>
<tr>
<th>Drug</th>
<th>Brand Name</th>
<th>Principal Actions</th>
<th>Sex Differences</th>
</tr>
</thead>
<tbody>
<tr>
<td>Halofantrine</td>
<td>Halfan®</td>
<td>Anti-malarial / malaria infection</td>
<td>Females&gt;Males</td>
</tr>
<tr>
<td>Haloperidol</td>
<td>Haldol®</td>
<td>Anti-psychotic / schizophrenia, agitation</td>
<td>When given intravenously or at higher-than-recommended doses, risk of sudden death, QT prolongation and torsades increases.</td>
</tr>
<tr>
<td>Ibutilide</td>
<td>Corvert®</td>
<td>Anti-arrhythmic / abnormal heart rhythm</td>
<td>Females&gt;Males</td>
</tr>
<tr>
<td>Levomethadyl</td>
<td>Orlaam®</td>
<td>Opiate agonist / pain control, narcotic dependence</td>
<td></td>
</tr>
<tr>
<td>Mesoridazine</td>
<td>Serentil®</td>
<td>Anti-psychotic / schizophrenia</td>
<td></td>
</tr>
<tr>
<td>Methadone</td>
<td>Methadose®</td>
<td>Opiate agonist / pain control, narcotic dependence</td>
<td>Females&gt;Males</td>
</tr>
<tr>
<td>Methadone</td>
<td>Dolophine®</td>
<td>Opiate agonist / pain control, narcotic dependence</td>
<td>Females&gt;Males</td>
</tr>
<tr>
<td>Pentamidine</td>
<td>NebuPent®</td>
<td>Anti-infective / pneumocystis pneumonia</td>
<td>Females&gt;Males</td>
</tr>
<tr>
<td>Drug</td>
<td>Brand</td>
<td>Medication</td>
<td>Gender Difference</td>
</tr>
<tr>
<td>--------------------</td>
<td>---------</td>
<td>---------------------------------</td>
<td>-----------------------------------------</td>
</tr>
<tr>
<td>Pimozide</td>
<td>Orap®</td>
<td>Anti-psychotic / Tourette's tics</td>
<td>Females&gt;Males</td>
</tr>
<tr>
<td>Probucol</td>
<td>Lorelco®</td>
<td>Antilipemic / Hypercholesterolemia</td>
<td>No longer available in U.S.</td>
</tr>
<tr>
<td>Procainamide</td>
<td>Pronestyl®</td>
<td>Anti-arrhythmic / abnormal heart rhythm</td>
<td></td>
</tr>
<tr>
<td>Procainamide</td>
<td>Procan®</td>
<td>Anti-arrhythmic / abnormal heart rhythm</td>
<td></td>
</tr>
<tr>
<td>Quinidine</td>
<td>Cardioquin®</td>
<td>Anti-arrhythmic / abnormal heart rhythm</td>
<td>Females&gt;Males</td>
</tr>
<tr>
<td>Quinidine</td>
<td>Quinaglute®</td>
<td>Anti-arrhythmic / abnormal heart rhythm</td>
<td>Females&gt;Males</td>
</tr>
<tr>
<td>Sotalol</td>
<td>Betapace®</td>
<td>Anti-arrhythmic / abnormal heart rhythm</td>
<td>Females&gt;Males</td>
</tr>
<tr>
<td>Sparfloxacin</td>
<td>Zagam®</td>
<td>Antibiotic / bacterial infection</td>
<td></td>
</tr>
<tr>
<td>Terfenadine</td>
<td>Seldane®</td>
<td>Antihistamine / Allergic rhinitis</td>
<td>No longer available in U.S.</td>
</tr>
<tr>
<td>Thioridazine</td>
<td>Mellaril®</td>
<td>Anti-psychotic / schizophrenia</td>
<td></td>
</tr>
</tbody>
</table>
DRUGS WHICH MAY INCREASE SERUM METHADONE

- CIMETIDINE (?? RANITIDINE)
- HIGH DOSE SSRI’S, ESP FLUOXETINE
- TRICYCLIC ANTIDEPRESSANTS
- FLUVOXAMINE - ++++
- ANTIRETROVIRALS – NORVIR, KALETRA
- ACIDIFICATION
- OTHERS – ATFORUM.COM
DRUGS WHICH DECREASE SERUM METHADONE CONCENTRATION

• RIFAMPIN, RIFABUTIN
• ALKALINIZATION AGENTS
• PHENYTOIN
• CARBAMAZEPINE
• BARBITURATES
• ALCOHOL (CHRONIC USE)
• PREGNANCY (2ND TRIMESTER)
WHERE DO WE GO FROM HERE??

- APPROPRIATE EVALUATION OF CARDIAC RISK IN PATIENTS – BOTH CURRENT AND PROSPECTIVE
- CAREFUL HISTORY AND CARDIAC EXAMINATION
- CONSIDERATION OF EKG IN HIGHER RISK INDIVIDUALS
- INFORMED CONSENT
WHERE DO WE GO?

- SOME PROGRAMS PROPOSING GETTING OLD EKG MACHINES, READING OWN TRACINGS, LOWER COST
- MEDICOLEGAL ISSUES WITH THIS WOULD BE SIGNIFICANT
- TREATMENT ALGORITHMS FOR THOSE WITH PROLONGED QTc??? –LACK OF EVIDENCE BASE
CONCLUSIONS

• QTc PROLONGATION REAL, POSSIBLE CLINICAL SIGNIFICANCE
• SCREEN PATIENTS FOR CARDIAC RISK BY H&P, ????? EKG
• REVIEW OTHER MEDS, WORK TO CHANGE TO SAFER MEDS IN THOSE AT HIGH RISK
• PATIENT/STAFF EDUCATION AND INFORMED CONSENT
THE FUTURE??

- LARGE SCALE PROSPECTIVE STUDIES
- DETERMINE COST/BENEFIT RATIO
- NUMBER NEEDED TO TREAT
- NUMBER NEEDED TO HARM
- COLLABORATION WITH OTHER SPECIALTIES – PSYCH, CARD, PCP
- STUDIES OF METHADONE ENANTIOMERS - DEXTRO/LEVO & PHARMACOGENOMICS
● ADEQUATE FUNDING!!!!!
References

• FDA Alert - Methadone Life Threatening Reactions  FDA Public Health Advisory 11/27/06.
PCSS-MAT Listserv

Have a clinical question? Please click the box below!

Ask a Colleague
A simple and direct way to receive an answer related to medication-assisted treatment. Designed to provide a prompt response to simple practice-related questions.

Ask Now
PCSS-MAT Mentoring Program

- PCSS-MAT Mentor Program is designed to offer general information to clinicians about evidence-based clinical practices in prescribing medications for opioid addiction.

- PCSS-MAT Mentors comprise a national network of trained providers with expertise in medication-assisted treatment, addictions and clinical education.

- Our 3-tiered mentoring approach allows every mentor/mentee relationship to be unique and catered to the specific needs of both parties.

- The mentoring program is available, at no cost to providers.

For more information on requesting or becoming a mentor visit: pcssmat.org/mentoring
PCSSMAT is a collaborative effort led by American Academy of Addiction Psychiatry (AAAP) in partnership with: American Osteopathic Academy of Addiction Medicine (AOAAM), American Psychiatric Association (APA), American Society of Addiction Medicine (ASAM) and Association for Medical Education and Research in Substance Abuse (AMERSA).

For More Information: [www.pcssmat.org](http://www.pcssmat.org)

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• If you pass the Post Test with a grade of 70% or higher, you will be instructed to click a link which will bring you to the Online Module Evaluation Survey. Upon completion of the Online Module Evaluation Survey, you will receive a CME Credit Certificate or Certificate of Completion via email.

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