

**Substance Use Guideline 4A
PERINATAL OPIOID USE,
CARE OF THE MOTHER**

INTRODUCTION

In Canada most female opioid users are of childbearing age, i.e. under age 34. The exact Canada wide prevalence of opioid exposure in pregnancy is unknown. However, estimates range between approximately 1-3% (Albersheim et al., 1993; Single et al., 1995). In the U.S. there are at least 7,060 births annually to women who use heroin or methadone in pregnancy (NIDA, 1996). Most opioid addicts come from single parent homes and most were raised in an environment of alcohol and substance abuse (Gold, 1998).

PHYSIOLOGY OF OPIOID USE

Opioids are natural or synthetic derivatives of the poppy plant. The resin from poppies is called opium and it can be smoked or ingested. The two natural derivatives of opium are morphine and codeine. Both can be ingested and morphine can also be injected. Codeine bought off the street mainly comes in the form of Tylenol #3 ("T3"). Heroin ("Down", "Junk", "H", "Horse") is a semisynthetic opioid, diacetylmorphine. Heroin can be smoked, snorted, ingested, or injected. It is usually bought in small quantities as "papers" or "flaps", and in larger quantities as a "point" (0.1 gm), "quarter" (0.25 gm) or gram. A 1 gm per day habit costs \$80.00 to \$180.00 in trade or cash daily. Methadone and fentanyl are completely synthetic opioids. Methadone has good oral bioavailability and is best taken by ingestion. Pharmacists are required to mix the methadone in a flavoured drink mix (typically orange or grape flavoured) to discourage injection. Thus clients may refer to methadone as "juice". For those patients on social assistance in B.C., the cost of methadone is currently paid for.

All opioids are metabolised in the liver and excreted by the kidneys. Heroin's half life is 4-6 hours. It metabolises into 6-monoacetylmorphine (6-MAM), seen in the urine for only about 6 hours after use. Then it is metabolised into morphine, which can be detected in the urine for 3 – 5 days after heroin use. Traces of codeine can also be present in the heroin and thus can appear in the urine. Codeine itself is metabolised into morphine but no 6-MAM. Morphine is excreted as morphine alone. Methadone has a half life of 24-36 hours and has its own array of metabolites (which do not include 6-MAM, codeine or morphine) which last 3-7 days in the urine (Gold, 1998).

Opioids act by binding to endogenous opioid receptors in the central nervous system, autonomic nervous system, smooth muscle, and vasculature. The primary action of heroin (and other opioids) is to bind to mu receptors located on noradrenergic neurons in the brain's alarm centre, the Locus coeruleus. The effect is to decrease the release of noradrenalin in the brain and body. Thus the user experiences a sense of wellbeing, relaxation, pain relief, dissociation from

suffering, and euphoria. The autonomic signs can include constricted pupils ("pinned"), somnolence ("on the nod"), decreased blood pressure, decreased heart rate, decreased respiratory rate, and decreased gastrointestinal motility (Gold, 1998).

Opioids also cause a release of dopamine in the brain's pleasure centre, the nucleus accumbens. It is the release of dopamine that is largely responsible for the positive reinforcing effects of drugs like heroin (Koob & Roberts, 1998).

When chronically exposed to opioids, changes take place such that when the opioid is then removed there is rebound hyperactivity of noradrenergic neurones along with a drop in dopamine levels. The brain's alarm system starts clanging and the "fight or flight" response shifts into high gear. Internally it seems that a life threatening emergency is going on when in reality the brain is just trying to re-equilibrate itself (Nester, 1998; Gold, 1998).

WITHDRAWAL

Illicit opioid use and abrupt withdrawal during pregnancy is dangerous to fetal wellbeing and can lead to: (Kaltenback et al., 1998)

- 1) Spontaneous abortion
- 2) Miscarriage
- 3) Premature labour
- 4) Premature rupture of membranes
- 5) Abruption
- 6) Stillbirth

I PROGRESSION OF OPIOID WITHDRAWAL SIGNS AND SYMPTOMS

A. Mild Withdrawal

- 1) Mild anxiety
- 2) Mild myalgias & arthralgias
- 3) Lethargy
- 4) Drug craving
- 5) Mild insomnia
- 6) Irritability & restlessness

B. Moderate Withdrawal

- 1) Chills alternating with flushing & diaphoresis
- 2) Moderate myalgias & arthralgias
- 3) Anorexia
- 4) Increased fetal movement
- 5) Nausea & stomach cramps
- 6) Yawning
- 7) Piloerection

- 8) Elevated pulse & blood pressure
- 9) Dilated pupils
- 10) Rhinorrhea
- 11) Lacrimation

C. Moderate to Severe Withdrawal

- 1) Diarrhea
- 2) Vomiting
- 3) Pronounced Insomnia
- 4) Tachycardia (pulse > 100 bpm)
- 5) Increased respiratory rate & depth
- 6) Tremors
- 7) Fetal tachycardia
- 8) Uterine Contractions
- 9) Premature labour, PROM
- 10) Abruptio
- 11) Spontaneous abortion/Miscarriage

D. Severe Withdrawal

- 1) Severe agitation and pain
- 2) Kicking movements of legs
- 3) Elevated temperature (usually low grade)
- 4) Placental abruption

Note: Withdrawal signs and symptoms differ in their order of appearance from one individual to another. Some individuals may not exhibit certain withdrawal signs and symptoms at all. With excessive fluid loss, dehydration and hypotension may occur.

Note: Since it is the opioid **withdrawal** that is generally the most risky time for the fetus, the mother should never be advised to stop opioid use abruptly. Instead, she should be offered appropriate treatment with methadone.

MATERNAL RISKS OF OPIOID USE

- 1) See Withdrawal on page 2
- 2) Craving for and use of an opioid can alter judgment and lead to risk-taking behaviors:
 - Needle sharing → (HIV, HCV, HBV and other infections)
 - Street work and STD's
 - Staying with abusive partner
 - Not receiving adequate prenatal care
- 3) Poor nutrition, cigarette smoking and lack of sleep

- 4) Death - At least 25% of opioid users die within 10 – 20 years of initiating active use, usually as a result of suicide, homicide, accidents and infectious diseases such as tuberculosis, hepatitis and AIDS (Kamerow et al., 1988).

FETAL / NEONATAL RISKS OR OPIOID EXPOSURE

- 1) Opioids in pregnancy are unlikely to pose a teratogenic risk, but the data are insufficient to say there is no risk (Little et al., 1990).
- 2) Heroin can be adulterated with teratogens like quinine (Hoegerman & Schnoll, 1991).
- 3) Heroin may lead to: (Deren, 1986; Doberczak et al., 1988; Hans, 1998)
 - Intrauterine growth restriction (IUGR)
 - Decreased birth weight
 - Decreased head circumference
 - Minor developmental delays
 - Increased risk of SIDS

It is important to note that other environmental factors such as poor nutrition, smoking cigarettes and lack of sleep will impact these outcome variables. In addition, most heroin addicts also use other street and prescription drugs making causal links more difficult. Neonatal abstinence syndrome (NAS) is a clear risk whenever there has been opioid dependence. Also, many infants born to opioid using mothers appear well and have no apparent adverse outcomes. Heroin use may be a risk factor but there may be other protective factors that play a role.

CLINICAL MANAGEMENT - METHADONE

It is recommended that every hospital that provides perinatal care have access to a methadone prescriber.

Conversion of heroin addicts to methadone is life saving. The relative risk of death for heroin addicts versus matched controls is 63x. This relative risk drops to 8x once methadone is initiated (Grondblah et al., 1990). One prospective study showed the HIV seroconversion rate to be 4x higher in those remaining on heroin versus those who switched to methadone (Metzger et al., 1993).

I *ADVANTAGES OF METHADONE CONVERSION DURING PREGNANCY (Payte & Zweben, 1998; Finnigan, 1991; Kaltenbach et al., 1998)*****

- 1) Improved prenatal care.
- 2) Improved nutrition.
- 3) Decreased incidence of maternal opioid withdrawal.
- 4) Engagement of the woman into alcohol and drug programs.
- 5) Decreased criminality and sex trade work.
- 6) Decreased injection drug use → decreased risk of blood born infections.

- 7) Decreased incidence of prematurity.
- 8) Decreased infant mortality.
- 9) Increased birth weight.
- 10) Increased infant head circumference.

II DISADVANTAGES OF METHADONE USE DURING PREGNANCY

- 1) Like heroin, methadone crosses the placenta and puts the neonate at risk for withdrawal (CPS, 1999 p. 1289).
- 2) Methadone may produce a more prolonged and pronounced NAS than heroin, and may require a longer hospital stay for the baby (Finnigan, 1991).
- 3) Maternal constipation, insomnia, increased sweating, decreased libido (NIDA, 1994).
- 4) Though better than heroin, there is a trend towards lower birthweight, smaller head circumference and minor developmental delays. All developmental parameters correct by 18 months to equal normal controls (Hans, 1998; Rosen, 1982).
- 5) Increased risk of SIDS (methadone elevates the risk over heroin).

Despite these concerns, in general methadone maintenance is the treatment of choice throughout pregnancy to maximize the chance of stability for the woman regarding relapse, withdrawal, infectious disease, nutrition, finances, and prenatal care (Miller, 1998; Kaltenbach et al., 1998; Finnigan, 1991).

Some women will, however, decline methadone maintenance and request tapering. Adequate studies have not been done comparing outcomes among those women methadone stabilized then maintained throughout pregnancy versus those women stabilized and then weaned (slowly withdrawn). There is one recent study in which 34 women were offered in hospital antenatal methadone detoxification. In this study 59% successfully completed detoxification and did not relapse, 29% relapsed to illicit opioid use and 12% could not complete the taper and opted to stay on methadone maintenance. There were no adverse fetal or obstetrical outcomes from the taper itself, though the 29% who relapsed were again at risk for all the above mentioned issues. The study did not provide a control group of mothers remaining on methadone to compare relapse rates and fetal outcomes (Dashe et al., 1998). Another study noted diminished incidence of NAS if mothers were weaned off methadone prior to delivery (Maas et al., 1990). In general there appears to be a dose response relationship between maternal methadone ingestion and severity of NAS seen in the offspring (Doberczak et al., 1993).

The experience at BC Children's and Women's Health Centre has been that under proper supervision, methadone detoxification may be done without obstetrical complications (see Antenatal Withdrawal Section). The risks delineated above remain if relapse occurs. In select women who have experienced recovery training, and with good social supports in place, methadone detoxification may be an appropriate option. It should be noted, however, that the risk of relapse is very high (90% within 1 year). This is very significant during the perinatal period since relapse will necessitate evaluation of child safety and custody issues.

III METHADONE STABILIZATION IN PREGNANCY (See Appendix A for Short Version)

Complete history, physical and investigations for a substance using woman (See Substance Use Guideline 3 – General Clinical Management for Pregnant Substance Using Women).

A. Day One

- 1) Methadone 10 – 40 mg po initial dose.
The exact initial dose should be written by the physician. It should be based on clinical judgment considering the amount, frequency and route of heroin intake (e.g. a woman using heroin 0.1 g/day by snorting may be given methadone 10 mg initial dose, whereas a woman using heroin 1 g/day IV may be given an initial dose of methadone 30 mg). If the amount of heroin use is uncertain then an initial methadone dose between 10-20 mg should be used.
- 2) Methadone 5–10 mg po q 3-6 hours prn for signs & symptoms of withdrawal.
- 3) Hold methadone dose if signs of drowsiness or if respiratory rate < 10.
- 4) Maximum 60 mg on the first day.
- 5) Vital signs before each dose and four hours after initial dose.
- 6) Ingestion of methadone should be witnessed.
- 7) NST q 1-2 days if > 26 weeks, done prior to initial daily dose of methadone (methadone can decrease reactivity of NST's).

Note: If initial uterine irritability give morphine 5 mg IV or 10 mg IM or PO, then begin methadone dosing schedule.

B. Day Two

- 1) If no prn doses required on Day One: give the same or lower initial dose and allow prn schedule as above.
- 2) If prn doses were required on Day One: increase initial dose and maximum dose by 5-10 mg each, and allow prn schedule as above.

C. Subsequent Days

- 1) Adjust dose daily (as on Day Two) until no signs and symptoms of withdrawal.
- 2) Convert all methadone into a once daily dose (or split the dose bid if a high dose is required or if the woman is in the third trimester).
- 3) Keep at stabilized dose for several days before discharge.
- 4) Other substances can be tapered or treated concurrently.

D. Other Medications

- 1) Acetaminophen 325 mg 1-2 tabs. q3-4h prn for pain.
- 2) Lorazepam 1 mg sl Hs prn for insomnia.

- 3) Diclectin 10 mg po bid and/or dimenhydrinate 25-50 mg po for nausea / vomiting.
- 4) Docusate sodium 100 mg bid prn and/or Prodiem and / or Metamucil (occasionally saline enema and/or lactulose may be needed) for constipation.
- 5) **Contraindicated:** naloxone, naltrexone, pentazocine, nalbuphine, butorphanol, clonidine.

E. Complimentary Treatments

- 1) From a licensed acupuncturist, acupuncture may be of assistance for withdrawal (Bullock, Cilliton, Olander, 1989; Ackerman, 1995; Brewington, Smith, Lipton, 1994). The National Acupuncture Detox Association (NADA) protocol for chemically dependent pregnant women consists of inserting 5 acupuncture needles in the external ear. These sites include Shen-men, Sympathetic, Kidney, Liver, and Lung. The client is treated while sitting for 30 minutes. This time can be used to relax, read, or meditate and the treatment ideally takes place in a group setting. Alternatively, black radish seeds taped to the external ear points can be used for acupressure and may be done by a trained lay person.
- 2) Therapeutic Touch – can provide pain relief, relaxation, and decreased anxiety (Heidt, 1981; Bzdek & Keller, 1986).
- 3) Calm, caring, and respectful environment.
- 4) Baths, hot and cold compresses.

F. Antenatal Methadone Withdrawal (Detoxification)

The usual recommendation is to be on methadone maintenance throughout pregnancy and for six months postpartum in order to engage the woman in prenatal care and reduce the risk of relapse, withdrawal, and blood born infections (Miller, 1998; Kaltenbach et al., 1998; Selby, 1998; Caloia, 1997). However, some women request detoxification from all drugs during pregnancy and are highly motivated to make significant life changes. The experience at BCCWH is that a slow, supervised withdrawal can be done without increased risk of abruption, preterm labour or fetal demise. Relapse issues have yet to be addressed, and so have parameters of neonatal health regarding methadone maintained versus withdrawn mother / baby pairs.

- 1) For Outpatients:
 - Methadone withdrawal can be done more cost effectively as an outpatient.
 - Decrease the dose every few days in small increments, i.e. by not more than 1-2 mg on any given day, adding up to not more than 5 mg every 1-2 weeks.
 - If > 26 weeks, NST's should be done weekly during tapering. Ultrasounds should be done q 2 weeks. If either of the above tests is abnormal, then tapering should be discontinued.

- 2) For Inpatients
 - Faster withdrawal can be done in hospital, i.e. 1-2 mg/day.
 - Reasons for hospital withdrawal include concurrent hazardous medical condition and unsafe home environment.
 - Keep 3 days after last methadone dose to ensure no more withdrawal. Prior to discharge ensure she has ready access to a methadone prescribing physician in case she later feels at risk of relapse and needs to go back on a very low dose.
 - If > 26 weeks, NST's should be done q 1-2 days during stabilization and tapering. Ultrasounds should be done q 1-2 weeks. If either of the above tests is abnormal, then tapering should be discontinued.

- 3) For Outpatients and Inpatients
 - Stop the taper and stabilize if she has signs and symptoms of withdrawal, intensifying drug craving, obstetrical issues, psychiatric issues, or behavioral issues. At times the dose may need to be increased. Once stable, the taper can begin again often at a slower rate of dose reduction.
 - Ensure connection to substance use treatment, counseling, and support groups.
 - Ensure prenatal follow-up and support.

G. Antenatal Hospital Discharge

Discharge occurs when the pregnant woman and fetus are stable from a holistic view. Medically this means substance use, infection and obstetrical considerations have been dealt with and follow-up has been arranged. Socially it means appropriate links in the community have been made so that she has minimally a safe environment to go to and food to eat. If discharged early due to persistent drug use (e.g. cocaine) give clean needle and syringe pack on discharge and ways to reaccess the system (See Guideline 2: Discharge Planning Guide for Substance Using Women and their Newborns).

H. Antenatal Outpatient Treatment

Hospital stabilization is highly recommended, especially in the third trimester. However, some women cannot or choose not to be admitted to hospital for conversion to methadone, as is recommended. In these cases methadone stabilization can be done as an outpatient.

- 1) See patient in the office in early am and give methadone 15-20 mg po.
- 2) Assess patient in 30 minutes. If tolerated, reassess in 4 hours for sedation and withdrawal symptoms.
- 3) Give methadone 5-10 mg q 4-6 hours prn for withdrawal signs or symptoms.
- 4) Hold doses if drowsy.
- 5) Evening dosing may be dispensed from an outpatient department if previously arranged.

- 6) Reassess patient daily and adjust dose.
- 7) Apply same principles as for inpatient management.
- 8) Warn against continued heroin use re: overdose and MCF issues.

I. Third Trimester

For women already stabilized on methadone either prior to pregnancy or during pregnancy, a dose increase in the third trimester may be needed due to increased blood volume and increased hepatic metabolism (Miller, 1998). The dose increase can be done in 5-10 mg steps per week as an outpatient. Hospitalization is not needed. Consider split dosing to keep total amount down and even out 24 hour blood levels. (Give 2/3 of dose witnessed in the morning and 1/3 dose “carry” for the evening). Office visits every 1-2 weeks for dosing and prenatal care are needed. Once past 26 weeks gestation, obstetrical ultrasounds q 2 weeks for interval growth and fetal well being, and fetal movement counts are advised. If NST is abnormal or there is decreased amniotic fluid, ensure obstetrical consult, stop any taper, consider dose increase if there are any withdrawal symptoms, and manage appropriately.

J. Women who Decline Methadone Stabilization

Some patients choose not to be stabilized on methadone, even once the advantages are explained and her fears are explored. Working with these women to reduce harm (vein care, withdrawal avoidance, clean technique) and strategies to stabilize or gradually taper the opioid of choice can be useful. Safe housing, food and prenatal care are paramount.

K. Women Already on Methadone Who Get Pregnant

For patients on methadone prior to conception, their usual methadone dose may be maintained. They may require a dose increase in the third trimester and /or split dosing.

L. Labour and Delivery

- 1) Ensure history, physical and lab work is completed.
- 2) If a woman presents in labour and is opioid dependent and not on methadone, then treat her withdrawal symptoms with morphine oral solution or by injection titrating dose to effect. Following delivery she can choose stabilization on methadone, or a medical detoxification with a Clonidine Protocol (contraindicated while pregnant due to placental effects). If she has decided to continue illicit drug use she may be open to harm reduction strategies around safer drug practices.
- 3) For the pregnant woman who presents in labour already on methadone, the usual methadone dose can be given in decreased fluid volume (ask pharmacy).
- 4) Minor dose increases may be needed due to exertion.
- 5) Usual labour and delivery pain medication can be used. Epidural is usually the preferred analgesic due to altered pain perception in these patients. Nitrous oxide may be useful in the second stage. Opiate analgesics like meperidine (Demerol)

may be used but the dose may need to be increased due to drug tolerance. It is safe to administer opiates as long as the patient is monitored for somnolence and respiratory depression.

Note: See Section D - Other Medications (Contraindicated)

M. Postpartum

- 1) Maternal methadone requirements usually drop due to the decrease in blood volume postpartum. Physician may decrease methadone over few days/weeks, titrate to effect.
- 2) May switch to once daily dosing if a split dose has been used.
- 3) Daily dispensing is the usual recommendation during pregnancy and breastfeeding in order to keep blood levels consistent. Otherwise, some women are pressured to share or sell their take home doses.

N. Breastfeeding

- 1) Breastfeeding provides optimal infant nutrition however, in the context of substance use many other considerations are involved. There needs to be a discussion of the risks and benefits and the mother needs to make an informed choice. Breastfeeding is contraindicated if HIV +, or if active substance use of certain substances is present (e.g. heroin, cocaine, amphetamines) (Howard & Lawrence, 1998). There is still debate about breastfeeding if the mother has HCV. The ACOG Committee Opinion titled Breastfeeding and the Risk of Hepatitis C Virus Transmission (1999) states, "Studies to date evaluating the effect of breastfeeding on HCV transmission indicate that the average rate of infection is 4% in both breastfed and bottlefed infants. Therefore, it appears that breastfeeding does not appreciably increase the risk of transmitting HCV to a neonate."
- 2) There is controversy over breastfeeding when the mother is on methadone. There is variability of maternal blood methadone levels and excretion in milk. Infant absorption may vary particularly if the infant receives a formula supplement. If the mother is using an opioid such as methadone and breastfeeding, the baby may experience withdrawal symptoms when breastfeeding is discontinued.
- 3) An approach endorsed by the American Pediatric Association (American Academy of Pediatrics Committee on Drugs, 1998) is that the woman may choose to breast feed if:
 - her methadone dose is < 20 mg/day
 - she has no blood born infections
 - she is not actively injecting drugs or using other substancesHowever, there is a range of approaches to methadone use and breastfeeding. In the recent *Principles of Addiction* published by the American Society of Addiction Medicine (1998), Dr. Miller advocates breast feeding at any methadone

dose as long as there is no other active drug use occurring and no blood born infections present. It may help to avoid breast feeding 2-4 hours after methadone dose (peak blood). Milk can be pumped prior to methadone dosing to feed the baby later if hungry, or formula supplementation can be given. The key is to observe the baby for signs and symptoms of sedation or withdrawal and act accordingly.

- 4) A methadone maintained woman may breast feed for up to 3 –5 months, after that the volume of milk the baby drinks is large enough to supply a sedating dose to baby and may produce NAS. Whenever breast feeding is discontinued the baby should be watched for withdrawal symptoms. For more information, please see BCRCP General Guideline 1 – Nutrition Part I: Breastfeeding the Healthy Term Infant.
- 5) The newborn requires special observation and care (See Guideline 4B: Perinatal Opioid Exposure, Care of the Newborn).

O. Postpartum Methadone Withdrawal (Detoxification)

The usual recommendation is to maintain on methadone for at least 6 months postpartum to ensure social and addiction stability. Having a normal newborn is stressful enough and these are often high needs infants. The mother's own early childhood issues may be activated by parenting, as may those of her partner. In addition, increased responsibility, decreased sleep, and possible postpartum depression put the new mother at increased risk of relapse to drug use. However, some mothers are very motivated to get off or taper back on methadone for a variety of reasons. For women who choose this option they may be weaned as an outpatient fairly quickly postpartum e.g. 1-2 mg / day. It is very important to monitor closely (once or twice a week at least) and stop or slow down the taper if the woman has withdrawal symptoms, or if she identifies that she is at risk of relapse. Remember there may be a high price to relapse when child safety and custody issues are at stake.

CLINICAL MANAGEMENT – MORPHINE STABILIZATION

If there is no methadone prescriber available in the community either temporarily (e.g. a weekend) or long term, then there are two options:

I REFERRAL

Referral directly to a centre that can prescribe methadone if it is in close proximity.

II STABILIZATION ON ORAL MORPHINE SOLUTION

If the woman is in active withdrawal or cannot be readily transported, she can be stabilized in hospital on oral morphine solution. After stabilization on morphine she can then be maintained temporarily until a prescriber is available, or until she can be

transported to a centre that does prescribe methadone. Morphine can only be given in the hospital under directly observed therapy.

Care should be taken when deciding to remove a woman from her community. Effort should be made to find her an outpatient prescriber close by so she can return home after stabilization.

Please see Appendix B for an example of a morphine stabilization protocol for opiate withdrawal used at St. Paul's Hospital in Vancouver, BC.

REFERENCES

Acherman, R. (1995). Acupuncture as treatment for substance abuse and its application during pregnancy. NADA Clearinghouse, Box 1927, Vancouver, Washington, 98662.

Albersheim, S., Mackinnon M. (1993). Infants of substance using mothers: A Canadian survey. Pediatric Research (33). 199.

American Academy of Pediatrics Committee on Drugs. (1998). Neonatal drug withdrawal. Pediatrics (101). NO.6, 1079-1088.

American College of Obstetricians and Gynecologists (1999). Committee Opinion Number 220. Breastfeeding and the Risk of Hepatitis C Virus Transmission. August. Authors.

Brewington, V., Smith, M., & Lipton, D. (1994). Acupuncture as a detoxification treatment: An analysis of controlled research. Journal of Substance Abuse Treatment(11), NO:4, 289-307.

Bullock, M., Cilliton, P., Olander, R. (1989). Controlled trial of acupuncture for severe recidivist alcoholism. The Lancet. 1435-1439.

Bzdek, V., and Keller, E. (1986). Effects of Therapeutic Touch on tension headache pain. Nursing Research(35), 101-106.

Caloia, D. (1997). Opioid dependence and methadone maintenance treatment during pregnancy. Journal of SOGC (19). 257-271.

Canadian Pharmaceutical Association. (1999). CPS Compendium of Pharmaceuticals and Specialities. Thirty-fourth Edition. Webcom, Toronto.

Dashe J., Jackson, G. Olscher D., et al. (1998). Opioid detoxification in pregnancy. Obstetrics and Gynecology (92). NO.5, 954-858.

Deren, S. (1986). Children of substance abusers: A review of the literature. Journal of Substance Abuse Treatment (3). 77-94.

Doberczak, T., Kardall, S., & Friedman, P. (1993). Relationships between maternal methadone dosage, maternal-neonatal methadone levels, and neonatal withdrawal. Obstetrics and Gynecology (81). 936-940.

Doberczak T., Thornton, J. et al. (1988). Impact of maternal drug dependency on birth weight and head circumference of offspring. American Journal of Diseases in Children (191). NO.11, 1163-1167.

Finnigan, L. (1991). Treatment issues for opioid-dependent women during the perinatal period. Journal of Psychoactive Drugs (23). NO.2, 135-146.

Gold, M. (1998). The pharmacology of opioids. In: Graham A., Schultz T. eds. Principles of Addiction Medicine. Second edition. Chevy Chase, MD: American Society of Addiction Medicine. 1199-1209.

Grondblah, L. et al. (1990). Yearly death rates in treated and untreated heroin addicts. Acta Psychiatry Scand. 223-227.

Hans, S. (1998). Developmental outcomes of prenatal exposure to alcohol and other drugs. In: Graham A., Schultz T. eds. Principles of Addiction Medicine. Second edition. Chevy Chase, MD: American Society of Addiction Medicine. 1223-1237.

Heidt, P. (1981). Effect of Therapeutic Touch on anxiety level of hospitalised patients. Nursing Research(30), 32-37.

Howard, L. & Lawrence, R. (1998). Breastfeeding and Drug Exposure. Obstetric and Gynecologic Clinics of North America (25). NO.1, 99-118.

Kaltenback, K., Berghella, V., & Finnegan, L. (1998). Opioid dependence during pregnancy. Obstetrical and Gynecological Clinics of North America (22). NO.1, 130-151.

Kamerow, D., Pincus, H., McDonald, D. (1998). Alcohol abuse, other drug abuse and mental disorders in medical practice: Prevalence, costs, recognition, and treatment. JAMA (22) NO.2, 2054-2057.

Koob, G. & Roberts A. (1998). Neurocircuitry targets in reward and dependence. In: Graham A., Schultz T. eds. Principles of Addiction Medicine. Second edition. Chevy Chase, MD: American Society of Addiction Medicine. 73-82.

Little, B., Snell, L. et al. (1990). Maternal and fetal effects of heroin addiction during pregnancy. Journal of Reproductive Medicine (35). NO.2, 159-162.

Maas, U., Kattner, E., Weingart-Jesse B., et al. (1990). Infrequent neonatal withdrawal following maternal methadone detoxification during pregnancy. Journal of Perinatal Medicine (18). 111-118.

Metzger, D., Woody, G., McLellan, A. (1993). Human immunodeficiency virus sero-conversion among intravenous drug users in an out of treatment: An 18 month prospective follow up. Journal of Acquired Immune Deficiency Syndrome (6). 1049-1056.

Miller, L. (1998). Treatment of addicted women in pregnancy. In: Graham A., Schultz T. eds. *Principles of Addiction Medicine*. Second edition. Chevy Chase, MD: American Society of Addiction Medicine. 1199-1209.

National Institute on Drug Abuse. (1994). Methadone maintenance treatment research in the United States: Questions and Answers. Manual by: National Institute on Drug Abuse, International Visiting Scientists and Technical Exchange program.

Nester E. (1998). Neuroadaptation of addiction. In: Graham A., Schultz T. eds. *Principles of Addiction Medicine*. Second edition. Chevy Chase, MD: American Society of Addiction Medicine. 57-72.

Payte, J., Zweben, J. (1998). Opioid maintenance therapies. In: Graham A., Schultz T. eds. *Principles of Addiction Medicine*. Second edition. Chevy Chase, MD: American Society of Addiction Medicine. 557-570.

Rosen, T. (1982). Children of methadone-maintained mothers: Follow-up to 18 months of age. Journal of Pediatrics (101). 192-196.

Selby, P. (1998). Pregnancy and opioid use: Management of the mother and drug exposed infant. In: Brands, B., Brands, J., (eds.) *Methadone Maintenance: A physician's guide to treatment*. The Addiction Research Foundation, 103-114.

Single, E., Williams, R., & McKenzie, D. (1995). *Canadian profile: alcohol, tobacco and other drugs*. Toronto: Addiction Research Foundation.

**APPENDIX A:
Methadone Stabilization in Pregnancy: Short Version for Hospital**

See Substance Use Guideline 3 – General Clinical Management for Pregnant Substance Using Women for History, Physical and Investigations

Methadone Dosing

Day One:

- Methadone 10-40 mg po initial dose (physician to specify exact amount)
- Methadone 5-10 mg po q3-6h prn for signs & symptoms of withdrawal.
- Hold methadone dose if there are signs of drowsiness or if respiratory rate < 10.
- Maximum of 60 mg first day.

Note: if initial uterine irritability give morphine 5 mg iv or 10 im, then begin methadone dosing schedule.

Day Two:

- If no prns required on Day One: give same or lower initial dose and allow prn schedule as above.
- If prns were required on Day One: increase initial dose and maximum dose by 5-10 mg each, and allow prn schedule as above.

Subsequent Days:

- Adjust dose daily (as on Day Two), until no signs & symptoms of withdrawal
- Convert all methadone into a once daily dose (or split bid if high dose or mother in third trimester)
- Keep at a stabilized dose for several days before discharge
- Other substances can be tapered or treated concurrently.

Other Medications:

- Acetaminophen 325 mg 1-2 q3-4h prn for pain.
- Lorazepam 1 mg sl hs for insomnia.
- Diclectin 10 mg po bid and/or dimenhydrinate 25-50 mg po prn for nausea/vomiting.
- Docusate sodium 100 mg bid prn and/or saline enema and/or lactulose for constipation.
- **Contraindicated:** naloxone, naltrexone, pentazocine, nalbuphine, butorphanol, clonidine

Complimentary Treatments:

- Acupuncture
- Therapeutic Touch
- Calm, caring, respectful environment
- Baths
- Hot and cold compresses

Discharge happens when the pregnant woman and fetus are stable from a holistic view. Medically this means substance use, infection and obstetrical considerations have been dealt with and follow-up has been arranged. Socially, it means appropriate links in the community have been made so that minimally she has a safe environment to go to, and food to eat.

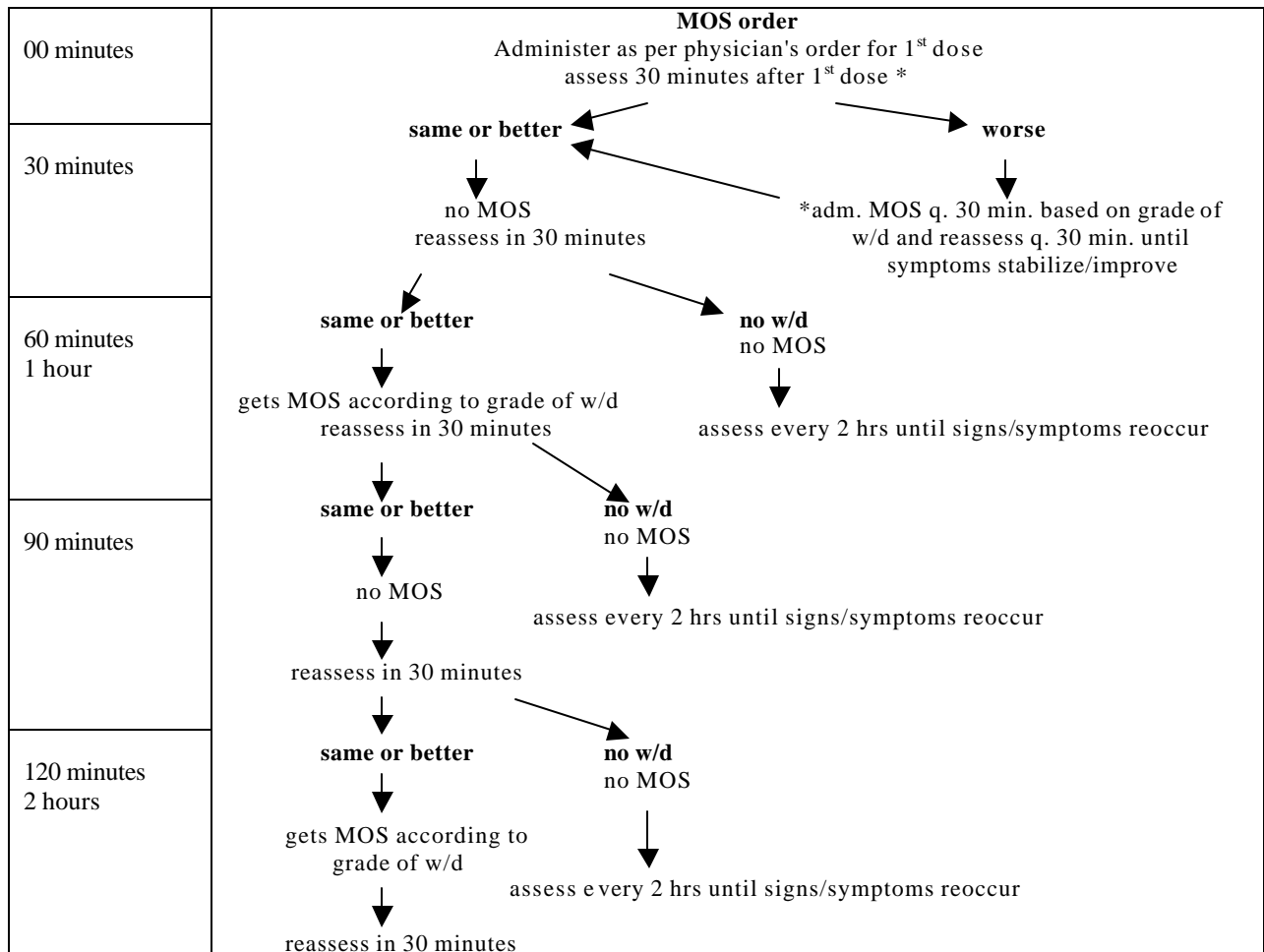
APPENDIX B

St. Paul's Hospital Emergency Department

MORPHINE STABILIZATION PROTOCOL (to treat opioid withdrawal)

GRADE OF WITHDRAWAL		MORPHINE ORAL SOLUTION (MOS)
Absent	no signs/symptoms	0
Grade 0	anxiety, craving	10 mg. or 20 mg.
Grade 1	yawning, perspiration lacrimation, rhinorrhea	10 mg. or 20 mg.
Grade 2	dilated pupils, gooseflesh tremors, hot and cold flashes	25 mg. or 35 mg.
Grade 3	elevated vital signs nausea, restlessness aches, cramps, insomnia	25 mg. or 35 mg.
Grade 4	vomiting diarrhea	* 10 mg. of IV Morphine Further doses at this Grade directed by Physician

1. Initial Stabilization



Continue for at least four hours or until steady state achieved, then go to 2.

Document the following with each assessment: 1. Grade of Withdrawal 2. Respiratory Rate 3. *GCS (Glasgow Coma Scale) (See page 17) **Hold morphine and call MD if GCS < 14 or if respiratory rate < 10** 4. Time/Dose of MOS

*** GLASCOW COMA SCALE (GCS)**

Eyes Open: Swollen Shut = C	Spontaneously 4 To Verbal Command 3 To Pain 2 No Response 1
Best Verbal Response Dysphasia = D ETT/Trach = T	Orientated and Converses 5 Disorientated and Converses 4 Inappropriate Words 3 Incomprehensible Sounds 2 No Response 1
Best Motor Response Paralysing Agents = P	Obeys 6 Localizes Pain 5 Flexion Withdrawal 4 Flexion Abnormal 3 Extension 2 No Response 1
TOTAL	

Nb. Hold morphine and call MD if GCS < 14 or if respiratory rate < 10

2. OMS Maintenance Dose (physician or protocol)

At the point of steady state, add up the amount of MOS administered in the past 4 hours (not including the dose just administered). With this sum "X", write maintenance MOS orders, as follows:

Maintenance dose: "X" mg PO Q4H around the clock
Breakthrough dose: "X/2" mg PO Q2H PRN for breakthrough symptoms

3. Adjustment of MOS maintenance dose (physician or protocol)

On a daily basis, assess patient for signs of treatment success, narcotic withdrawal, and/or narcotic overdose. Add up the total amount of MOS administered (including all PRN doses) over the past 24 hours. With this sum "Y", recalculate the dose and write the new maintenance MOS orders, as follows:

Maintenance dose: "Y/6" mg PO Q4H around the clock
Breakthrough dose: "Y/12" mg PO Q2H PRN for breakthrough symptoms

4. Maternal / Fetal Assessment

Please remember to do a full assessment for pregnant mother and her fetus and monitor their health. See Substance Use Guideline 3: General Clinical Management of Pregnant Substance Using Women. Monitoring for morphine effects are similar to methadone.