Medical Conditions

Guidance for the Medical Evaluation of Law Enforcement Officers
provided by ACOEM

Pregnancy
**PREGNANCY**

**INTRODUCTION**

Due to the legal issues associated with pregnancy and employment (see Legal Framework below), this chapter is intended to serve as guidance for the police physician in advising the pregnant law enforcement officer (LEO) of the risks associated with performing essential job functions, and to enable her in decision-making. This has been summarized in an informational handout developed by the ACOEM Task Group for the pregnant LEO (see Appendix A).

The majority of pregnant LEOs will be able to continue to work throughout pregnancy, with some accommodations. A point will likely come during the pregnancy when the physical changes to the body of the pregnant LEO will impair her ability to perform some of the essential job tasks, and appropriate restrictions will need to be offered.

**LEGAL FRAMEWORK**

This document does not constitute legal advice. Before developing a pregnancy policy, or before restricting or removing a pregnant LEO against her will, police physicians and AHJ should seek competent legal advice. The International Association of Chiefs of Police (IACP) provides a model policy on pregnancy (see Appendix B).

The Pregnancy Discrimination Act of 1978 states that discrimination on the basis of pregnancy or childbirth constitutes unlawful sex discrimination under Title VII of the Civil Rights Act of 1964. Women who are pregnant or have related conditions must be treated in the same manner as other applicants or employees with similar abilities or limitations. An employer may not force a pregnant employee to take disability leave if she is able to work and cannot remove her from her duty assignment if she is able and willing to perform it. The Pregnancy Discrimination Act applies to most employers that have 15 or more employees.

The U.S. Supreme Court ruled in 1991 that an employer may not exclude pregnant women from hazardous jobs. Therefore, assuming the pregnant officer is willing and able to perform her essential job tasks, police agencies should give options to pregnant officers, but ultimately it is up to the individual officers to decide, after consultation with their personal physician, whether they accept a light duty assignment or other reasonable changes in their job assignments.

**TYPE OF RISKS**

**Introduction**

The pregnant LEO can be exposed to the following hazards associated with adverse outcomes to the pregnancy or damage to the fetus:

- Chemical hazards, include exposure to heavy metals (e.g., lead, mercury), organic solvents (e.g., benzene, formaldehyde, halogenated hydrocarbons, styrene, toluene, trichloroethylene, xylene), and pesticides.
- Physical hazards include trauma, radiation, heat, and noise.
- Biological hazards – As first responders, LEOs are at a higher risk of exposure to infectious agents. Pregnancy by itself does not increase that risk. However, with some agents (e.g., novel H1N1 influenza), the risk of complication is higher during pregnancy. Pregnant LEOs should be aware of these risks and follow good hygiene principles.

**Trauma**

- The uterus extends out of the protection of the pelvis after 13 weeks and is therefore more susceptible to direct trauma (to the uterus or the fetus) after that gestational point.
- Fetal mortality is increased during the first 23 weeks, possibly due to higher susceptibility to maternal hypotension during the first and second trimesters.
With blunt trauma, the leading causes of fetal death are maternal shock, abruption and uterine rupture. Direct fetal injury from blunt trauma is rare.

Fetal mortality rates due to maternal trauma:
- Overall with major trauma: 40 to 65 percent
- Overall with minor trauma: 1 to 5 percent
- In case of maternal pelvic fracture: 25 to 35 percent
- Gunshot wound to abdomen: 30 to 50 percent.

Long-term outcomes after trauma: Besides fetal loss, trauma is also associated with higher risk of preterm labor and placental bleeding. The risks of preterm labor and low birth weight were found to be nearly doubled in a series of patients discharged from a trauma center.

Seatbelts: The use of seatbelts is safe and recommended during pregnancy. Proper seat belt positioning during pregnancy is as followings: lap belt under the abdomen and shoulder harness between the breasts, as improper placement may result in uterine rupture. Seat belt use significantly reduced fetal mortality (5-fold reduction) in a series of cases of pregnant patients injured in motor vehicle accidents.

Body armor: Standard body armor is not designed to protect the fetus, and typically does not cover the lower abdomen. The body armor fitted pre-pregnancy may not offer the same level of protection during pregnancy.

Firearms Training

Lead exposure: Lead exposure during pregnancy is associated with serious maternal-fetal complications, including miscarriage, premature rupture of membranes, pre-eclampsia, hypertension, and neurobehavioral effects in infants and children. Even at low levels, lead exposure has been associated with preterm delivery, congenital abnormalities, and decreased birth weight, length, and head circumference. Current research suggests that there is no safe lead exposure threshold for children, infants, or fetuses.

Exposure to other metals: Firearm training can expose officers to other metals than lead, including barium, antimony, copper, and arsenic. These metals could be toxic, depending on their concentration. Lead-free ammunition, while eliminating the lead exposure, has been found to generate airborne copper levels above the Air Force occupational exposure limit.

Exposure to organic solvents: Some organic solvents used to clean firearms, like xylene, might be harmful to the fetus.

Exposure to noise: Noise exposure during pregnancy has been associated, in human studies, with several adverse outcomes, including miscarriage, intrauterine growth retardation, preterm delivery, hearing loss in babies and children, and hypertension in pregnancy. In a review of 10 studies on pregnancy and noise, most studies did

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a Inorganic lead is absorbed by inhalation and ingestion. Blood absorption of inhaled lead is 30 to 40%, and blood absorption of ingested lead is 5 to 15%. Lead is then mostly stored in bones. The half-life of lead is 1 to 3 months in blood and soft tissues and 10 to 25 years in bones. Lead crosses the placenta and is transmitted from the mother to the fetus. Lead is excreted mainly through the kidneys and gastrointestinal tract. Lead is also excreted in breast milk.

b Firing ranges at five U.S. Air Force bases were surveyed. Four bases were using lead-free, frangible ammunition, and one base was using lead ball ammunition. Firing ranges at two bases (using lead-free rounds) had airborne fume copper levels above the Air Force occupational exposure levels (OEL). The average values for lead, zinc, ammonia, hydrogen cyanide and phosgene were all well below the OEL. The OEL for copper is 0.1 mg/m3 as a fume.
not achieve statistical significance in showing negative effect of noise. The safe threshold of noise exposure during pregnancy is unknown.

**Other chemicals:** Clandestine drug laboratories and hazardous-material scenes can be dangerous. Clandestine drug laboratories can expose officers to a variety of toxic chemicals, some of which are potentially injurious to the fetus. Extensive exposure to exhaust fumes (such as directing traffic, tunnel and toll booth duty) might be dangerous because of exposure to carbon monoxide, benzene and other organic solvents from motor vehicles. An Italian study found that benzene exposure in traffic officers was about twice as high as in a control population of office workers. In the U.S., gas used for regular road traffic does not contain benzene. In developing countries that use leaded gasoline, lead exposure can be a significant problem for traffic officers.

**Radiation:** LEOs assigned to prisoner transport via aircraft or other high-altitude aviation may encounter radiation exposure of significance to a fetus.

**Shift work:** Alternating shift work and night work have been associated with preterm birth, miscarriage, and lower birth weight. Existing research is controversial.

**Heat:** In animal studies, increase in maternal core temperature over 1.5°C has been shown to be teratogenic. While the risk of hyperthermia is not proven in human pregnancies, it is safer to prevent hyperthermia during pregnancy, especially during the first two months. Sports Medicine Australia recommends “to avoid exercise in hot conditions.” Exercising in a warm environment should be limited, and adequate hydration should be maintained with physical activity.

**Physical activity:** Prolonged working hours, heavy lifting, prolonged standing and heavy physical workload have been associated with preterm birth, lower birth weight and pre-eclampsia.

**Medical issues:** The American College of Obstetricians and Gynecologists has published a list of medical contraindications to exercise during pregnancy. That list could be used to recommend work accommodation to pregnant officers who are suffering from specific complications (see Appendix C).

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c Intrauterine measurements showed that the fetus was not significantly protected against loud noises. One study in human volunteers found a maximal intrauterine noise attenuation of 10 dB at 4000 Hz. In a study of ewes, the noise attenuation was 20 dB at 4000 Hz, but low-frequency sounds less than 250 Hz were 2 to 5 times greater inside the uterus. The sound levels of police firearms are about 155 to 165 dB. The sound of a siren can reach up to 110 dB inside the cab of an emergency vehicle.

The Navy and Marine Corps Public Health Center makes the following recommendations:

1. The ACGIH [American Conference of Governmental Industrial Hygienists] 115 dBC TWA [time weighted average] and peak 155 dBC noise notations should be observed as exclusion criteria starting at 20 weeks gestation. Excluding pregnant women from discharging firearms after 20 weeks gestation would be consistent with those criteria. 2. Pregnant workers should be vigilant in wearing hearing protectors whenever environmental noise exceeds 84 dBA, to minimize potentially unhealthy maternal cardiovascular and endocrine effects on the growing fetus. 3. Extended exposures (more than 12 minutes) above 104 dBA should be avoided after 20 weeks gestation, even with the use of maternal hearing protection. 4. Impact/impulse noise exposure sufficient to require personal hearing protection should be avoided.

d At an altitude of 30,000 feet, the dose equivalent rate from cosmic rays is about 1.6 to 4.1 microsieverts (0.16 to 0.41 millirem) per hour. The Federal Aviation Administration (FAA) recommends that occupational exposure to the unborn child should be less than 0.5 millisievert (50 millirems) in any month and less than 1 millisievert (100 millirems) during the remainder of the pregnancy (after it is reported to management). Other aviation-related potential hazards for the fetus include vibration, noise, jet fuel and altitude.

e In a review of studies on pregnancy and shift work, 8 out of 12 showed a significant (but usually small) adverse effect of alternating shift work on pregnancy. A meta-analysis of 17 studies of shift work during pregnancy found a significant but small (relative risk 1.2) effect of shift work on preterm delivery; but no association between shift work and birth weight. In a meta-analysis of 4 studies of pregnancy among nurses, shift work was significantly associated with a slightly increased risk of miscarriage.

f A meta-analysis of 53 studies of occupational exposures (prolonged working hours, shift work, lifting, standing and heavy physical work-load) during pregnancy, found a significant but small effect of long working hours (beyond 40 hours a week) on preterm birth; and a significant but small effect of prolonged standing (more than 3 hours day) on preterm birth. The influence of these occupational exposures on pre-eclampsia is less clear.
RISKS BY TRIMESTERS

<table>
<thead>
<tr>
<th>Risk</th>
<th>First Trimester</th>
<th>Second Trimester</th>
<th>Third Trimester</th>
<th>Lactation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trauma</td>
<td>The risk of direct fetal trauma is mitigated due to the location of uterus, which is a pelvic organ in the first trimester</td>
<td>The risk of direct fetal trauma is increased due to the intra-abdominal position after 13 weeks</td>
<td>The risk of direct fetal trauma is increased due to the intra-abdominal position after 13 weeks</td>
<td>No additional risk</td>
</tr>
<tr>
<td>Chemicals</td>
<td>Heavy metals, hydrocarbons</td>
<td>Heavy metals, hydrocarbons</td>
<td>Heavy metals, hydrocarbons</td>
<td>Heavy metals, hydrocarbons</td>
</tr>
<tr>
<td>Other risks</td>
<td>Noise, radiation, shift work, infections</td>
<td>Noise, radiation, shift work, infections</td>
<td>Noise, radiation, shift work, infections</td>
<td>No additional risk</td>
</tr>
</tbody>
</table>

RECOMMENDED ACTIVITY MODIFICATIONS DURING PREGNANCY

The following activities are not recommended during the entire pregnancy:

- Firearms qualification and practice with live ammunition using gunpowder propellant
- Receiving a TASER discharge in training
- Oleoresin capsicum exposure in training (unknown risk)
- Hazmat assignment or exposure to toxic chemicals (e.g., firing range assignment, vehicle maintenance assignment)
- Exposure to ionizing radiation
- Exposure to high-volume vehicular traffic, such as assignments near tunnels and tolls, or foot patrol in an area with high exposure to exhaust fumes
- Aviation unit assignment
- Raids on clandestine drug labs

Recommendations by Trimester:

First Trimester

- Modified duty only if requested by the LEO in consultation with her personal (treating) physician.
- Patrol duties may be permitted.
- See Recommended Activity Modifications above for activities that are not recommended during entire pregnancy.

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Footnote:

* Firearms qualification and practice: It is best to avoid firearms training and qualification with live ammunition during pregnancy. Alternatives to live-fire training include electronic simulators and air pistols. Pregnant officers who choose to attend a live-fire training session may take the following steps to minimize their exposure:
  a. Use lead-free, less noisy simulation ammunition
  b. Use lead-free, “non-toxic” ammunition, with lead free primers (although it could expose the officer to other heavy metals, which may be potentially toxic)
  c. Wear an appropriate respirator
  d. Use a suppressor
  e. Train at an outdoor, rather than indoor, firing range (to reduce exposure to noise and chemicals)
  f. Shoot the smallest possible number of rounds
  g. Wear heavy clothing that covers the abdomen
  h. Avoid picking up fired cartridge cases or shotgun shells
  i. Avoid cleaning firearms (by the pregnant officer) or being in enclosed areas where firearms are cleaned
  j. No eating, drinking or smoking while at the firing range
  k. Careful washing of hands and face before leaving firing range, especially before eating, drinking, or smoking
  l. It would be safest for officers not to use lead ammunition even before pregnancy.
Second Trimester

- Patrol duties may be permitted if the LEO is able and willing to perform them. The police physician should ensure that the LEO and her treating physician are aware of risks created by the job assignment.
- Modified duty if requested by the LEO (e.g., investigation, office work).
- An accommodation for maternity uniform or civilian clothing may be needed.
- See Recommended Activity Modifications above for activities that are not recommended during entire pregnancy.

The following activities are also not recommended during the second trimester:
- Firearms qualification and practice
- Defensive tactics training involving groundfighting, falls or blunt trauma
- Contact with prisoners (due to risk of trauma)
- Restraining and arresting suspects
- Assignments with alternating shift work
- Standing post assignment
- Heavy lifting and prolonged standing

Third Trimester

- The LEO may have to be taken off patrol duties when she is unable to perform the required job functions due to issues with balance, speed, and/or agility. She should be given a modified duty assignment.
- An accommodation for maternity uniform or civilian clothing may be needed.
- See Recommended Activity Modifications above for activities that are not recommended during entire pregnancy.

The following activities are also not recommended during the third trimester:
- Firearms qualification and practice
- Defensive tactics training
- Contact with prisoners (due to risk of trauma)
- Restraining and arresting suspects
- Assignments with alternating shift work
- Standing post assignment
- Heavy lifting and prolonged standing

POST-DELIVERY: RETURN TO WORK

Because of different types of deliveries and associated complications, return-to-work decisions should be based upon an individualized evaluation of the LEO’s current status and the requirements of her work assignment.

Once the LEO requests to return to full duty with the consent of her treating health care provider, all restrictions for patrol duty and training should be lifted, unless other medical issues are present.

The physician should consider various issues such as:
- Delivery trauma and mode of delivery
- C-section healing
- Physical deconditioning, fatigue and lack of sleep
- Musculoskeletal conditions (e.g., back pain, carpal tunnel syndrome, tendonitis)
- Pregnancy-related issues

Sports Medicine Australia recommends waiting for up to 6 weeks after delivery before performing intense physical exercises.

In a series of 100 patients with complications after a C-section, the most common complications were endomyometritis (63 patients), wound infection (32 patients), wound hematoma (22 patients), and postpartum hemorrhage (12 patients). Wound dehiscence was seen in 4 patients. All complications were seen within 10 days of the surgery. Sports Medicine Australia recommends waiting for 6 weeks after C-section to resume exercising.
Hypertension
Eclampsia
Gestational Diabetes
Post-partum depression
Post-partum thyroiditis
Deep venous thrombosis
Anemia
Other complications

POST-DELIVERY: LACTATION

LEOs who are breastfeeding should avoid unprotected exposure to toxic levels of heavy metals and other chemicals.

Firearms training is known to create exposure to toxic chemicals, including lead and other heavy metals. There is a correlation between lead levels in maternal blood and breast milk. Even low levels of lead are toxic to infants. It might be best to avoid unprotected firearms training and qualification while breastfeeding. Wearing an appropriate respirator and careful hand hygiene should allow most breastfeeding officers to safely train with firearms. Officers who are breastfeeding should avoid work assignments at a firing range.

LEOs who choose to do live-fire qualification may take the following steps to minimize the risk of secondary contamination of their child:

- Use lead-free “non-toxic” ammunition, with lead-free primers (although it could expose the officer to other heavy metals, which may be potentially toxic, e.g., copper)
- Train at an outdoor rather than an indoor firing range
- No eating, drinking, or smoking while at the firing range
- Clean firearms before leaving the firing range
- Carefully wash hands and face before leaving the firing range (and after cleaning firearms), especially before eating, drinking, or smoking
- Wear an air-purifying respirator
- After firearms training, LEOs should change and shower before leaving the range
- LEOs should change footwear after range activities, prior to leaving the range
- Clothing worn at range should be washed at the range or separated from the family wash
APPENDIX A: Medical Information Regarding Issues Related to Pregnancy in Law Enforcement

Handout: Issues Related to Pregnancy in Law Enforcement

The following information is intended to help you make informed decisions regarding your job activities if you are pregnant or considering becoming pregnant:

- The majority of pregnant law enforcement officers (LEOs) will be able to continue to work throughout pregnancy, with some accommodations.
- You should discuss with your treating physician any individual conditions that may require limitation of activities during pregnancy.

The following activities may have adverse effects at any time during pregnancy:

- Live-fire qualification and practice (for example, use of lead-free ammunition, avoidance of weapon cleaning solvents and other modifications may reduce the exposure and resultant risks)
- Receiving a TASER discharge in training
- Exposure to toxic chemicals (for example, raids on clandestine drug labs, HAZMAT events)
- Exposure to high-volume vehicular traffic (for example, assignments near tunnels and tolls, or foot patrol in an area with high exposure to vehicular exhaust)

First trimester – In addition to the above, there are no other activities with an adverse effect.

Second trimester – In addition to the above, the following activities may have adverse effects:

- Defensive tactics training involving groundfighting, falls, or blunt abdominal trauma
- Contact with prisoners (due to risk of trauma)
- Restraining and arresting suspects
- Alternating shift work, prolonged standing and heavy lifting

Third Trimester – In addition to the above, there are no other activities with an adverse effect. Activities that involve or require speed, agility and balance may be adversely affected by body changes of pregnancy.

Post-delivery – Return-to-work decisions should be based upon an individualized evaluation of your current status, the requirements of your work assignment, and the type of delivery and complications.

Lactation – Exposure to toxic substances as outlined above (for example, live-fire training) may result in these substances being present in breast milk.

Standard body armor is not designed to protect the fetus, and typically does not cover the lower abdomen. The body armor fitted pre-pregnancy may not offer the same level of protection during pregnancy.

The International Association of Chiefs of Police has also developed a model policy on pregnancy which can be ordered through their web site at www.theiacp.org/PublicationsGuides/ModelPolicy/tabid/135/Default.aspx (see Appendix B).

APPENDIX B: International Association of Chiefs of Police Model Policy on Pregnancy

Subject: Pregnancy
Effective Date: March 2010
Reevaluation Date: March 2011

To purchase a copy of the IACP Model Policy on Pregnancy, please contact the National Law Enforcement Policy Center at (800) 843-4227 ext. 319 or policycenter@theiacp.org. Policies can also be purchased online at www.theiacp.org/policycenter.
APPENDIX C: American College of Obstetricians and Gynecologists’ Opinion on Exercise during Pregnancy*

Absolute contraindications to aerobic exercise during pregnancy:
- Hemodynamically significant heart disease
- Restrictive lung disease
- Incompetent cervix/cerclage
- Multiple gestation at risk for premature labor
- Persistent second or third trimester bleeding
- Placenta praevia after 26 weeks gestation
- Premature labor during the current pregnancy
- Ruptured membranes
- Preeclampsia/pregnancy-induced hypertension

Relative contraindications to aerobic exercise during pregnancy:
- Severe anemia
- Unevaluated maternal cardiac arrhythmia
- Chronic bronchitis
- Poorly controlled type I diabetes
- Extreme morbid obesity
- Extreme underweight (body mass index <12)
- History of extremely sedentary lifestyle
- Intrauterine growth restriction in current pregnancy
- Poorly controlled hypertension
- Orthopedic limitations
- Poorly controlled seizure disorder
- Poorly controlled hyperthyroidism
- Heavy smoker

Warning signs to terminate exercise while pregnant:
- Vaginal bleeding
- Dyspnea prior to exertion
- Dizziness
- Headache
- Chest pain
- Muscle weakness
- Calf pain or swelling (need to rule out thrombophlebitis)
- Preterm labor
- Decreased fetal movement
- Amniotic fluid leakage

REFERENCES


