

Work Capacity Test/Firefighter Preview and Focused Risks

The Work Capacity Test (WCT) is a physical fitness test approximating the cardiac and respiratory work a person with light, moderate or arduous duty would expend during that tested time period. For arduous duty, the “pack test” involves carrying a 45 lb. pack for 3 miles to be completed in 45 minutes. For moderate duty, the “field test” involves carrying a 25 lb. pack for 2 miles to be completed in 30 minutes. For light duty, the “walk test” involves walking 1 mile in 16 minutes. All of these tests are quite brisk walks. None of these tests actually test the essential functions of the job, that is not their intent. These tests are not without risk.

Wildland firefighting is typically a 12-16 hour shift of arduous work daily for 14-21 days in a smoky and dusty remote environment actively working on fire suppression. This environment can be very steep, slick, and uneven. You will carry a pack that will be about 34 pounds or more, and you may carry extra equipment depending on your job that may weigh an extra 20-30 pounds.

CARDIAC RISK

Participating in the WCT or performing the duties of wildland firefighting could induce a heart attack, a malignant arrhythmia (dangerous abnormal heartbeat), and/or possibly cause death. If you have a history of heart disease or have experienced symptoms of heart problems (shortness of breath with minor exertion, chest pain, pain in the neck or jaw radiating to the shoulder or arm, abnormal heartbeat or rhythm you have not had before), you need to be evaluated by a medical provider.

SICKLE CELL RISK

People with sickle cell trait have a higher risk of a bad outcome with heat related injury and illness as well as rhabdomyolysis with exertion, during the WCT or wildland firefighting.

ASTHMA RISK

People with asthma should have a discussion with their primary care provider about the actual duties of a wildland firefighter (see [Essential Functions and Work Conditions of a Wildland Firefighter](#)) with exposure to dust and smoke and whether the medical provider recommends doing the job with their asthma diagnosis.

PREGNANCY RISK

If you are pregnant, the exertion required of the WCT or the job duties could run the risk of a miscarriage or inducing premature labor.

Negative effects of wildland firefighting while pregnant can be many. Exposure to the heavy metals naturally in the dirt (lead, arsenic, copper) can potentially cause birth defects, fetal death or miscarriage. The combined heat produced by exertion and the fire can potentially cause fetal malformations as the critical body systems of the fetus are being created in the first half of pregnancy. Performing at near maximal capacity, lifting heavy weight, and work that causes prolonged straining can decrease the blood flow to the baby causing fetal hypoxemia. There is no noise protection to a fetus other than noise avoidance. Prolonged noise exposure can cause fetal hearing defects, low birth weight or preterm labor. Working long hours or at heavy labor can cause negative effects on birth weight and cause an increased incidence of preterm labor. In late pregnancy, there is a shift in center of gravity which increases the likelihood of falls and balance problems on steep or uneven ground. There is also increased joint laxity in late pregnancy which increases the likelihood of injuries, especially sprains and dislocations.

Smoke exposes the mother to carbon monoxide, fine particulate matter (PM 2.5), heavy metals, and other toxins. Carbon monoxide exposure to a pregnant woman may affect the fetus. Once carbon monoxide reaches the baby's

Work Capacity Test/Firefighter Preview and Focused Risks

blood, it takes much longer to clear than it does for the mother's blood. The effects of the carbon monoxide on the fetus are dependent on when in the pregnancy the exposure occurs and how much of a carbon monoxide exposure occurs. Possible effects are low birth weight, problems with brain development, and fetal death. The particulate matter (PM) of concern in wildfire smoke, PM2.5, can trigger a systemic inflammatory response that can affect vital organs of the employee but also the placenta in pregnant women thus affecting the blood flow to the fetus.

A pregnant woman is always at risk for syncope or near syncope (passing out), and nausea and vomiting of pregnancy can be exasperated by smoke and dehydration or worsen dehydration. The mental health of pregnant women can be significantly impacted by stress over concerns of the risks to both the fetus and the mother when exposing both to the fire environment as well as affect the pregnancy negatively.

POST-PARTUM RISK

There are several risks after uncomplicated childbirth, specifically muscles that need to get back in shape in order to do the heavy lifting and hiking needed. For a regular vaginal birth, the pelvic floor muscles along with the abdominal muscles need time to contract and strengthen again. If a cesarean section was done, the abdominal muscles need time for healing. The time it takes to heal and safely return to routines such as exercise or work is unique to each individual and will rely on the obstetrician understanding the requirements of the job and giving specific documented restrictions.