

## When is Metatarsal Protection Required?

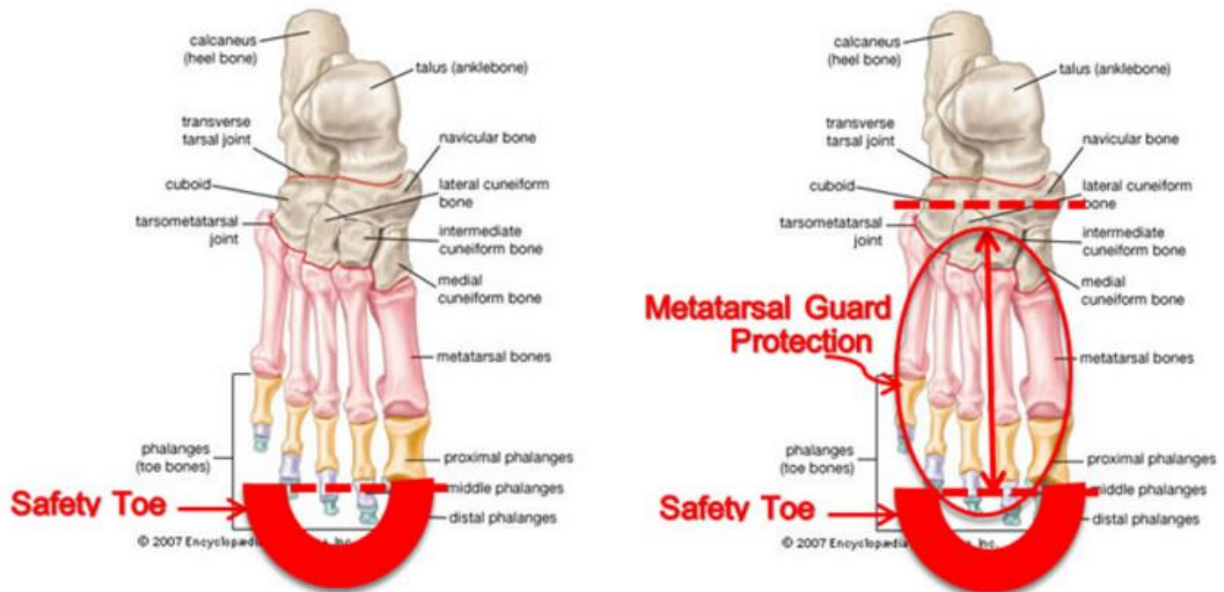


The five metatarsal bones are the long thin bones of the midfoot. A metatarsal fracture occurs when one of these long bones is broken. This may be due to sudden injury: typically an object dropped on the foot. The tarsal bones break easily and such an injury can take months or years to heal. In acute fractures you may hear a sound at the time of the break, and experience pain, swelling, and difficulty putting weight on the foot.



The metatarsal bones (the top of your foot shown as pink bones in the image below) are vulnerable to injury. Because your feet stick out in front of your body line, they are likely to be hit by a falling object. In addition, metatarsals are not large bones and break easily.

Metatarsals are not protected by steel toe shoes. Steel toe shoes protect the toes (and puncture from underneath). The image below shows the difference between steel toes and metatarsal guard protection.



The legislation says that metatarsal protection should be provided when there is a “substantial risk of a crushing injury” to the foot.

Metatarsal boots are mostly required when lifting or rolling heavy and typically metal objects (train wheels, loaded drums of liquid, etc.). The hazard is greater when the object

has sharp surfaces that focus or concentrate the weight if dropped. For example, a 50 pound bag of flour would not need metatarsal protection because the weight is distributed over a large area. The risk or likelihood of dropping the object is also a consideration. The risk of dropping can be increased if the object is large, awkward to carry/move or is slippery (from oil or other lubricants).

Consider this; An OSHA study indicated that the typical foot injury was caused by mostly metal objects with a median weight of 65 pounds and dropping less than 4 feet. If injuries typically occur under these conditions, the threshold for having metatarsal protection should be less than these conditions. The Bureau of Labour Statistics calculates that 80% of foot injuries occur from objects that weigh 30 pounds or more. The legislation calls for metatarsal protection when there is a substantial risk of injury.

It is suggested that a 30 pound weight and significant potential to be dropped on the foot for a metal object is a working definition of “substantial risk”. For objects or materials that are rolled, it would take more weight than if it were dropped, but the force typically strikes only the outer or inner metatarsal. It is suggested that rolling an object of more than 50 pounds would require metatarsal protection.

CSA approved work boots with internal metatarsal guards are now available. Such footwear carry a dark grey/black rectangle with the letter M.



Dark grey rectangle with M letter indicates metatarsal protection. **Note:** Toe protection is required for all metatarsal protective footwear.



Images of Work boots with Metatarsal Protection



Metatarsal guards also provide better protection from molten metal, falling embers, etc. They are often required PPE in foundries for this reason but also provide better protection for welders.

**Note:**

The Manitoba legislation calls for “outer guards that provide metatarsal protection”. Outer guards can catch on each other while walking and pose a potential tripping hazard. Legislation in other jurisdictions such as B.C requires that metatarsal protection be integral part of the footwear. Presumably boots with built in metatarsal protection would also be an acceptable interpretation to the legislation.

**Image of External Metatarsal Guard (alone and on one foot)**

