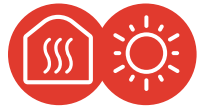


# Heat Stress ACCLIMATIZATION



## Improving the Body's Tolerance to Heat

Working in hot environments can increase the risk of heat-related injuries and illness.



One of the most effective ways to protect yourself from heat stress is to acclimatize.

### What is Acclimatization?

Heat acclimatization is the improved ability to tolerate heat due to adaptations in the body. These adaptations are created by gradually increasing the amount, duration and intensity of work performed in hot conditions.



AMOUNT



DURATION



INTENSITY

### Benefits of Acclimatization



INCREASED BLOOD FLOW /CIRCULATION  
(helps remove heat from body)



HIGHER SWEAT RATE  
(helps remove heat from body)



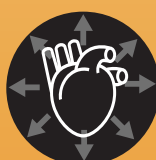
LESS SALT IN SWEAT  
(prevents electrolyte imbalance)



LOWER AVERAGE BODY TEMPERATURE



LOWER AVERAGE HEART RATE



REDUCED CARDIOVASCULAR STRAIN and INSTABILITY



REDUCED AVERAGE METABOLIC RATE  
(prevents fatigue)



IMPROVED TEMPERATURE REGULATION and TOLERANCE

Here in Ontario, heat stress events are infrequent and rarely long enough for outdoor workers to become acclimatized, and acclimatization can be challenging due to wide variations in temperature and humidity\*\*.

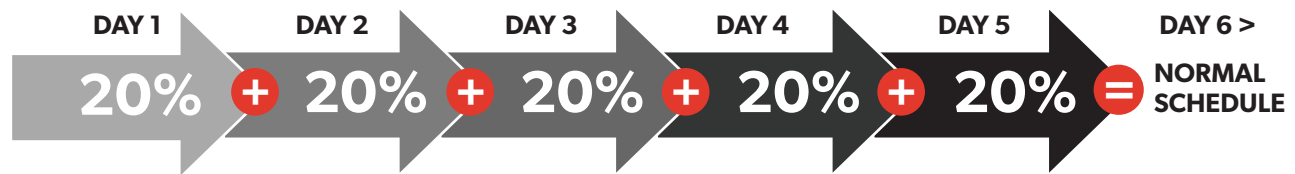
# How Do We Acclimatize?

Heat acclimatization is achieved through heat stress exposures that cause the body to develop heat adaptations\*. Many of the adaptations required for acclimatization can be developed within the first 4-6 days of heat exposure, and the remaining adaptations are generally developed after 10-14 days.

## 20% Rule (Recommended by NIOSH)

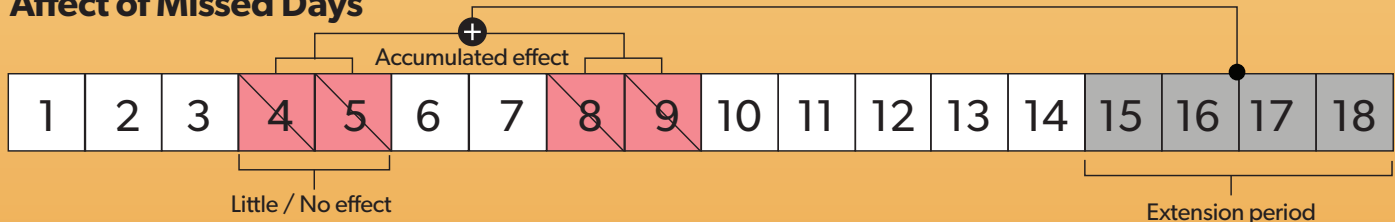
**DAY 1:** Unacclimatized workers should work only **20%** of the normal duration on their first day in a hot environment.

**Each Day After:** Work duration can be increase by **20%** on each subsequent day until the worker is performing a normal schedule.



The shorter the acclimatization period, the faster the worker will lose their acclimatization when they stop working.

### Affect of Missed Days



If **1 or 2 days** of heat exposure are missed during a 10 to 14-day period, the acclimatization process should not be affected.

If **3 or more days** are missed, the acclimatization period should be extended accordingly.

### Loss of Acclimatization

When working in hot conditions is stopped, there is a noticeable loss in acclimatization after just 4 days.

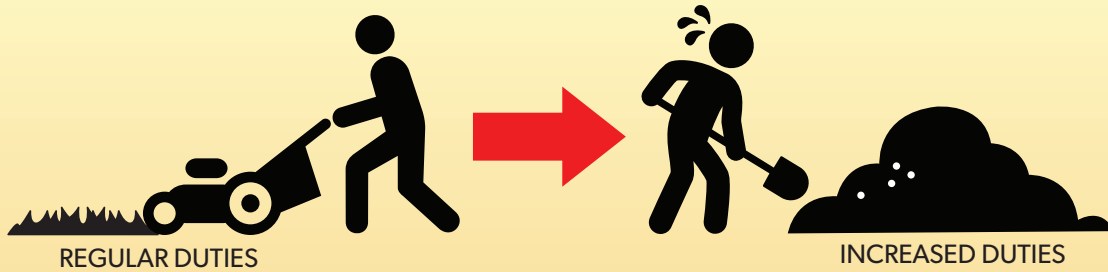
**!** Acclimatization can be completely lost in 3 to 4 weeks.

### Re-acclimatization

The rate of re-acclimatization is much quicker for a returning worker than for a new worker, but 4 to 5 days is generally required for re-acclimatization.

If a worker does not work in hot conditions for longer than 4 weeks, they should repeat the acclimatization process.

\*See page 1, Benefits of Acclimatization



A worker is only acclimatized to their **regular work duties, activities and conditions.**

If a worker has their work increased or changed in some way, they should be considered **unacclimatized**, and a new acclimatization process should be followed.

Even an acclimatized worker can be at risk of heat stress due to the following factors:



DEHYDRATION



CERTAIN  
MEDICATIONS



LACK OF PHYSICAL  
FITNESS



RECENT or CURRENT  
ILLNESS / INJURY



PRE-EXISTING  
CONDITIONS



SUDDEN or  
OCCASIONAL  
HIGHER HEAT



REPEATED  
STRENUOUS DAYS  
IN THE HEAT



A focus on fitness during the fall, winter and spring will help support the physical adaptations required for acclimatization, such as blood and sweat production.



**\*\* The MOL Heat Stress Guideline states that "hot spells in Ontario seldom last long enough for workers to acclimatize".**

Workers performing *moderate* work\* would not be assumed to be acclimatized by the same criteria, unless there is significant radiant heat associated with the work. Workers performing *heavy* work,\*\* however, could probably be considered acclimatized once into the warm weather season. The acclimatized heavy work WBGT numbers are similar to the moderate unacclimatized.

\*some pushing, lifting, etc.    \*\*shovelling dry sand

Since the TLV® is based on data derived from 20-year-old males weighing an average of 154 lbs., "real" workers probably burn up more calories than the TLV® light category assumes. Selecting the "moderate" work category will account to some extent for workers who are somewhat dehydrated, older (e.g., over 40), not male, and heavier than 154 lbs.



For other infographics in this series, or to learn more about working in the heat, see our Heat Stress Toolkit:

