

Heat Stress Management at Workplaces



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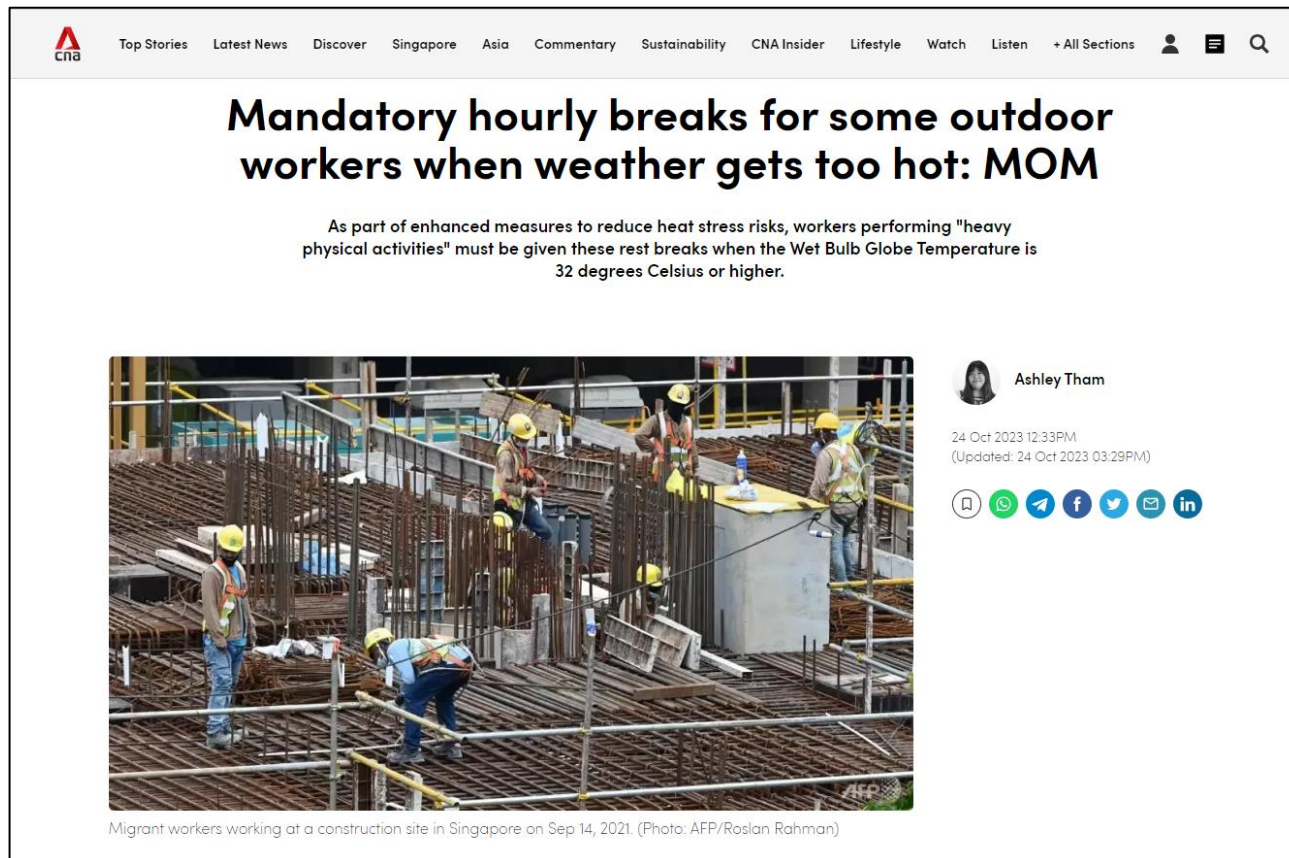
24 Nov 2023



A Great Workforce A Great Workplace


MOM issued a press release on Enhanced Measures to Reduce Heat Stress for Outdoor Workers on 24 October 2023

A warmer climate puts workers, particularly those performing manual work outdoors, at an increased risk of heat stress.



Mandatory hourly breaks for some outdoor workers when weather gets too hot: MOM

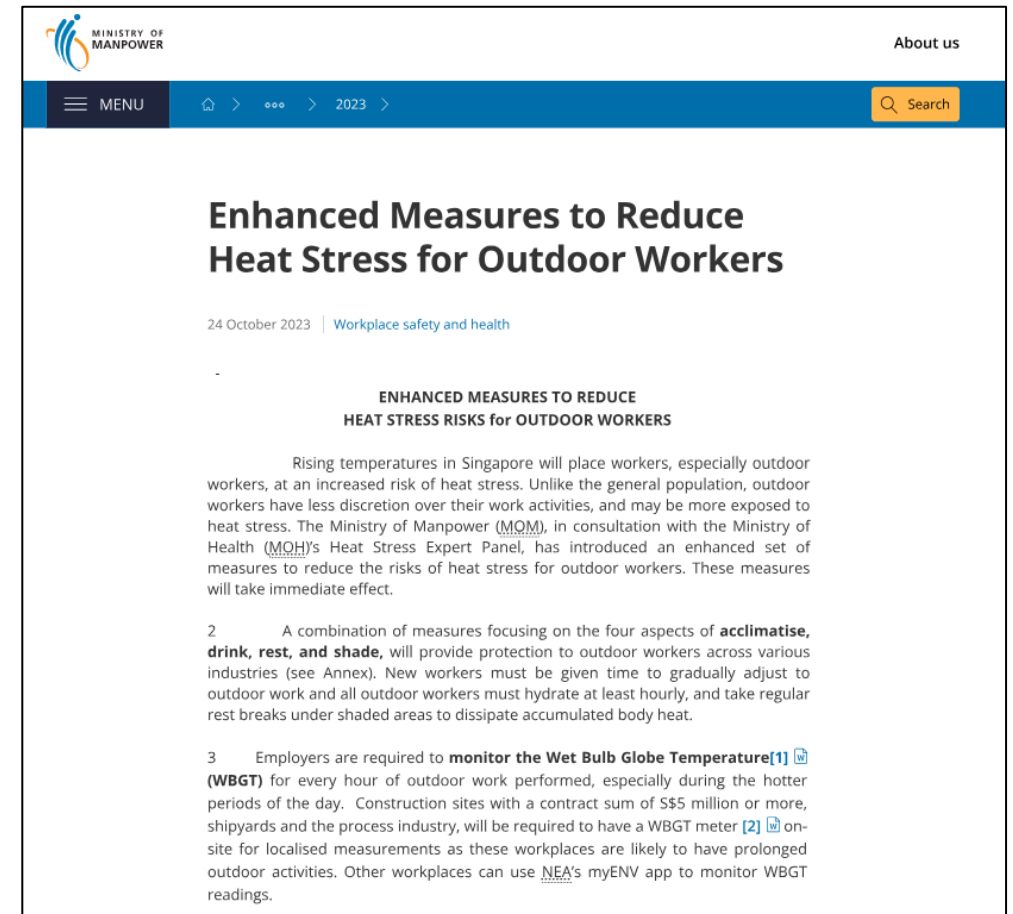
As part of enhanced measures to reduce heat stress risks, workers performing "heavy physical activities" must be given these rest breaks when the Wet Bulb Globe Temperature is 32 degrees Celsius or higher.



Ashley Tham

24 Oct 2023 12:33PM
(Updated: 24 Oct 2023 03:29PM)

Migrant workers working at a construction site in Singapore on Sep 14, 2021. (Photo: AFP/Roslan Rahman)



Enhanced Measures to Reduce Heat Stress for Outdoor Workers

24 October 2023 | Workplace safety and health

ENHANCED MEASURES TO REDUCE HEAT STRESS RISKS for OUTDOOR WORKERS

Rising temperatures in Singapore will place workers, especially outdoor workers, at an increased risk of heat stress. Unlike the general population, outdoor workers have less discretion over their work activities, and may be more exposed to heat stress. The Ministry of Manpower (MOM), in consultation with the Ministry of Health (MOH)'s Heat Stress Expert Panel, has introduced an enhanced set of measures to reduce the risks of heat stress for outdoor workers. These measures will take immediate effect.

2 A combination of measures focusing on the four aspects of **acclimatise, drink, rest, and shade**, will provide protection to outdoor workers across various industries (see Annex). New workers must be given time to gradually adjust to outdoor work and all outdoor workers must hydrate at least hourly, and take regular rest breaks under shaded areas to dissipate accumulated body heat.

3 Employers are required to **monitor the Wet Bulb Globe Temperature^[1]** (WBGT) for every hour of outdoor work performed, especially during the hotter periods of the day. Construction sites with a contract sum of S\$5 million or more, shipyards and the process industry, will be required to have a WBGT meter **[2]** on-site for localised measurements as these workplaces are likely to have prolonged outdoor activities. Other workplaces can use NEA's myENV app to monitor WBGT readings.



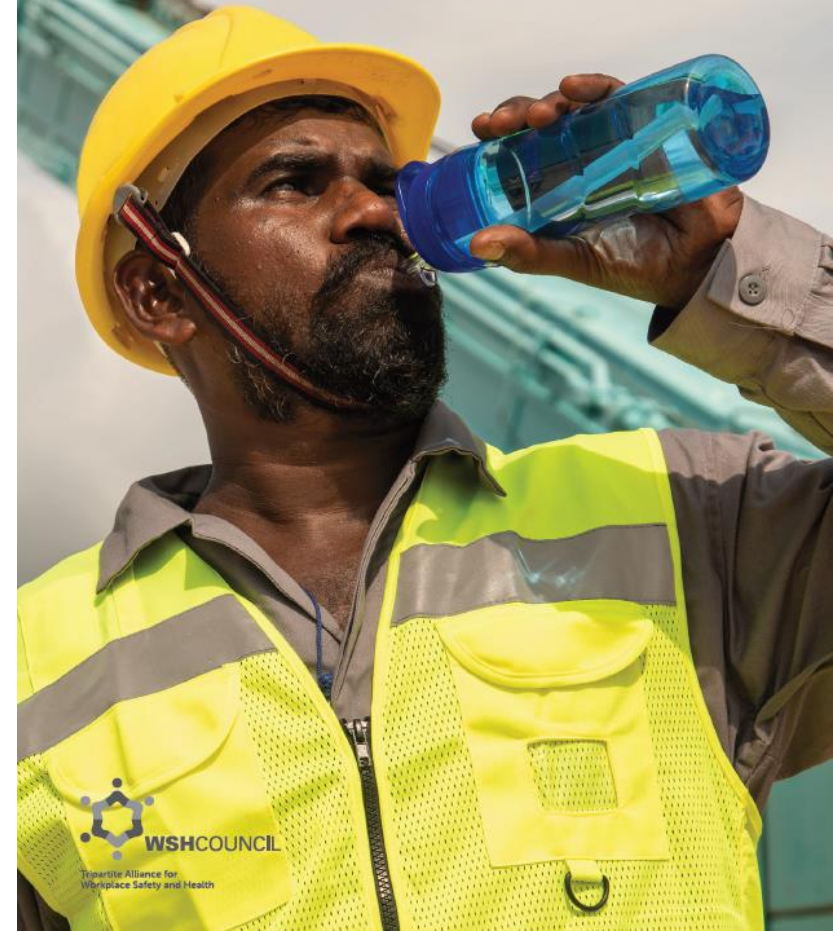
Overview

- Heat Stress Management at Workplaces
 - ❑ Risk Management
 - ❑ Heat Acclimatisation & Work Rescheduling
 - ❑ Adequate Water Intake
 - ❑ Monitoring WBGT
 - ❑ Adequate Rest Under Shade
 - ❑ Physical Preventive Measures
 - ❑ Worker's & Supervisor's Training
 - ❑ Emergency Response & First Aid



Workplace Safety and Health Guidelines

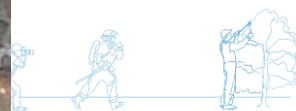
Managing Heat Stress in the Workplace



Heat Stress Management at Workplaces



- Heat stress risk is foreseeable and well-recognised for outdoor works
 - Physical exertion + work environment + personal risk factors
- Heat sources in indoor environment could also pose heat stress risk
- Implement measures to prevent heat-related injuries



Risk Management

- Risk assessment to include heat stress hazard for outdoor work activities and indoor hot processes
- Identify workers vulnerable to heat stress and re-deploy them when required
- Monitor Wet Bulb Globe Temperature (WBGT)

WBGT	Heat Stress Risk Level
< 31°C	Low
31°C to 31.9°C	Moderate
≥ 32°C	High

WBGT risk table



Re-deployment plan



WBGT meters



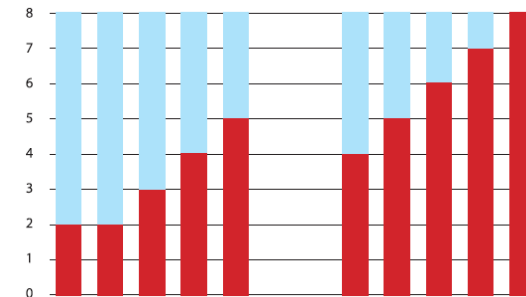
WBGT hourly recording



Heat Acclimatisation & Work Rescheduling

- Heat acclimatisation programme for
 - Newly assigned worker
 - Returning from long leave (more than 1 week)
 - Prolonged illness
 - New or returning worker from a country with colder climate
- Gradually increase daily heat exposure over at least 7 days
- Reschedule heavy physical work to cooler periods of the day
 - Avoid 11am-3pm as far as possible

Hemisphere	Winter Months
Northern Hemisphere	Dec, Jan , Feb
Southern Hemisphere	June, July, August



Acclimatisation

Metabolic Examples	Examples
Heavy	Intense arm and trunk work, carrying, shovelling, manual sawing; pushing and pulling heavy loads; and walking at a fast pace.

Heavy physical work



Short breaks under shade



Adequate Water Intake

- Provide drinking water supply / facilities at locations near work areas and under shade (e.g. provide cold drinks to outdoor workers via water cooler, vending machines, cold drinks in cooler boxes)
- Schedule and supervise hourly hydration for workers

Rehydrate at least hourly and recommended intake of 300ml per hour or more depending on the rate of water loss base on work intensity



Shaded water cooler with cool water



Vending machine onsite



Supervised hydration



Shaded rest area with fans



Monitoring WBGT at Workplaces



Wet Bulb Globe Temperature (WBGT) is commonly used for workplace environmental monitoring of heat stress

WBGT takes into account the 4 environmental factors:

- Ambient temperature
- Relative humidity
- Wind speed
- Radiation(e.g. sunlight)



Heat Stress Risk Level	WBGT
Low	< 31°C
Moderate	31°C to 31.9°C
High	≥ 32°C



Timely implementation of control measures based on heat stress risk assessed at the workplace

Note: Ambient temperature ≠ WBGT



Monitoring WBGT at Workplaces



Employers required to monitor WBGT for every hour of outdoor work performed, especially during the hotter period of the day



Who are required to have a WBGT meter on-site?

- Construction sites with contract sum of S\$5 mil or more
- Shipyards
- Process Industry

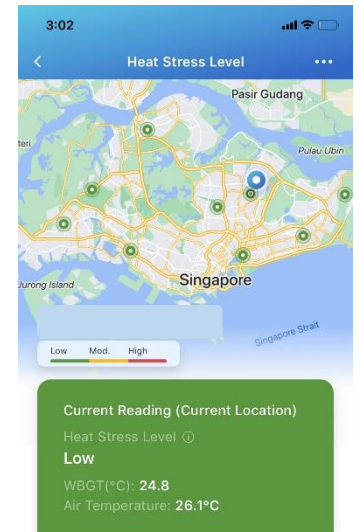
Effective from 1 Jan 2024

Other workplaces can use NEA's myENV app to monitor WBGT readings

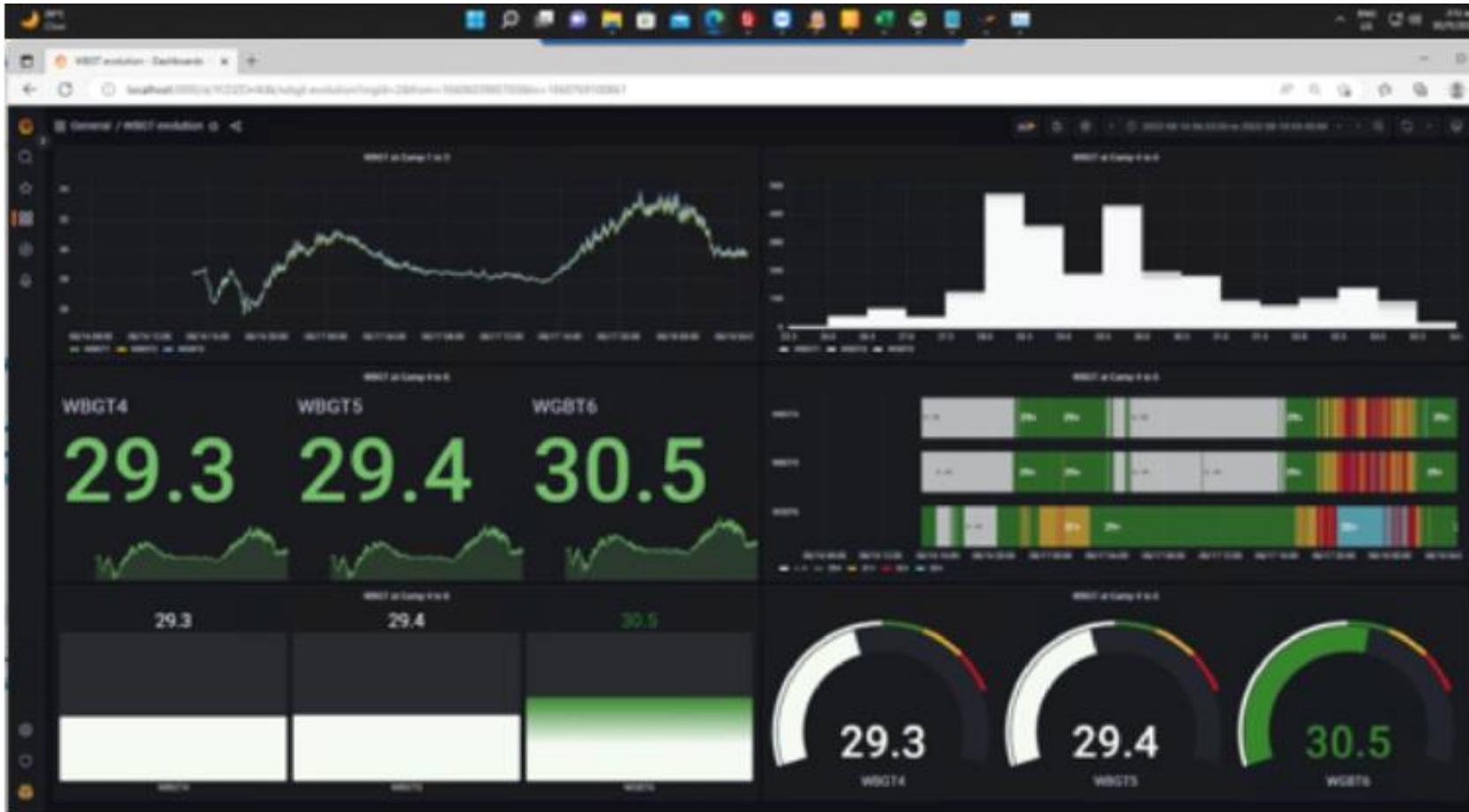


How should WBGT be measured at the workplace?

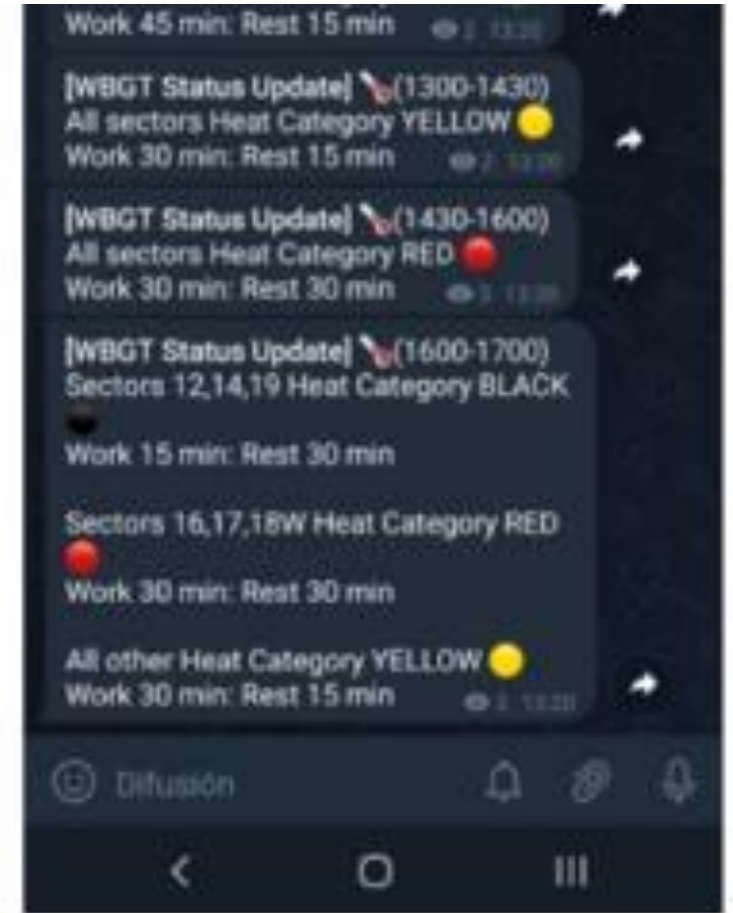
- Monitor at locations representative of heat stress risk
- Place meter under direct sun exposure and not blocked by buildings or shade
- Conduct at least one point of outdoor WBGT monitoring. For larger site, multiple points of measures are recommended.



Monitoring WBGT at Workplaces



Real time WBGT monitoring



Alert system



Adequate Rest Under Shade

- Ensure workers get adequate rest under shade to allow for recovery from heat. Rest area to be near work area, where feasible.
- Provide **hourly rest breaks of a minimum of 10 minutes** for heavy physical work activity when WBGT is 32°C or higher.
- Recommend to provide longer rest duration with higher WBGT, heavier physical activity and if shade cannot be provided at work areas.

WBGT value	32 ≤ WBGT (°C) < 33		WBGT (°C) ≥ 33	
Work Activity	Light physical activity	Heavy physical activity	Light physical activity	Heavy physical activity
Frequency, Rest Duration	Hourly, 5 to 10 mins rest	Hourly, 10 mins rest	Hourly, 10 mins rest	Hourly, 15 mins rest

Note:

1. Thresholds are based on outdoor WBGT measurements.
2. Light physical activities include (but not limited to) light to moderate manual hand, arm, trunk or leg work; pushing and pulling light loads; and normal walking.
3. Heavy physical activities include (but not limited to) intense arm and trunk work, carrying, shovelling, manual sawing; pushing and pulling heavy loads; and walking at fast pace.
4. Rest duration to be increased with higher WBGT, heavier physical activity and if shade cannot be provided at work areas.
5. More rest may be required, depending on workers' personal health condition.



Physical Preventive Measures

At rest and work areas:

- Provide effective shade to reduce direct sun exposure
- Provide adequate ventilation for effective cooling
- Provide loose-fitting and light-coloured clothing to workers
- Provide insulation for radiant heat sources
- Provide mechanical aids to reduce workers' physical workload



Air coolers



Shaded work area



Ventilation at work area

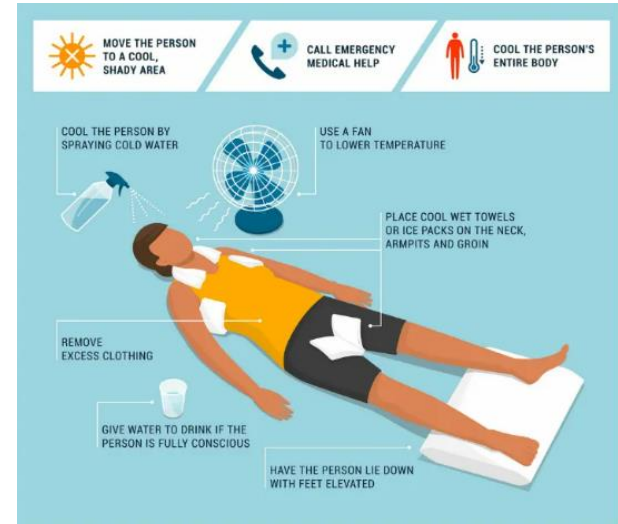


Shaded rest areas



Emergency Response & First Aid

- Establish reporting procedures for workers and sub-contractor who feel unwell
- Establish on-site emergency response procedures for heat injury
 - ❑ E.g applying ice packs, wet towels or cool water, fanning the affected person, using cooling blankets and cold water immersion
 - ❑ Conduct drill for heat injury scenario
 - ❑ Standby ice packs or other heat injury response facilities on-site
- Appoint first aiders for workplace with > 25 persons employed
- Employer to submit WSH incident report within 10 days of diagnosis for heat injury as occupational disease



Source:
www.firstaidpro.com.au/heatstroke-first-aid/

First aid procedures



Ice packs at workplace



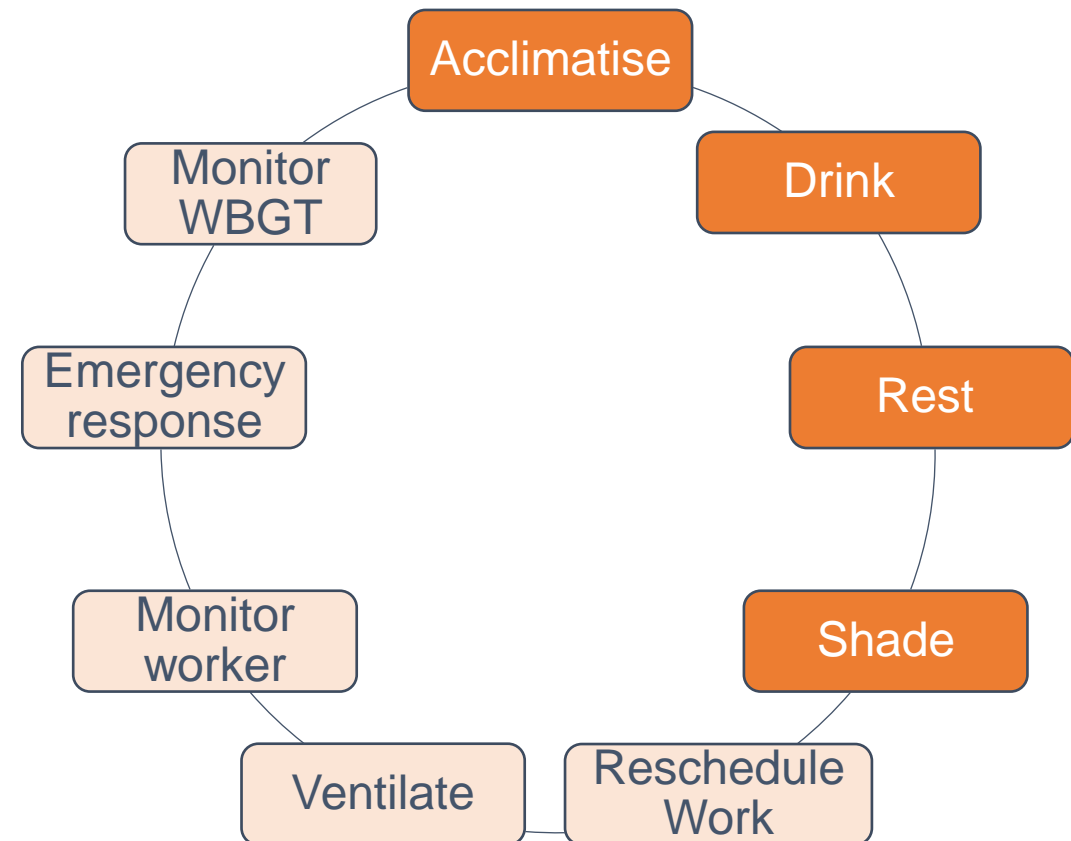
First aider appointed and undergone "Occupational first aid course"



Conclusion

- Heat injuries can be easily prevented
- Communicate heat stress risks and raise awareness
- Be prepared for hotter weather and step up to protect your workers.

Heat Stress Measures



Resources

Heat Stress Management Compliance Checklist

Heat Stress Management Compliance Checklist			
Risk Management	Yes	No	Follow-up
1. Conduct risk assessment and include heat stress hazard for outdoor work activities	<input type="checkbox"/>	<input type="checkbox"/>	
2. Monitor Wet Bulb Globe Temperature* at the workplace to assess heat stress risk	<input type="checkbox"/>	<input type="checkbox"/>	
3. Identify workers vulnerable to heat stress and make re-deployment arrangements for vulnerable workers when required	<input type="checkbox"/>	<input type="checkbox"/>	
Heat Acclimatisation & Work Rescheduling	Yes	No	Follow-up
4. Implement heat acclimatisation programme for workers who are: <ul style="list-style-type: none"> a) Newly assigned to outdoor work b) New or returning from countries with a cold climate c) Returning from long leave (more than 1 week) d) Recovering from prolonged illness 	<input type="checkbox"/>	<input type="checkbox"/>	
5. Reschedule heavy physical work to cooler periods of the day	<input type="checkbox"/>	<input type="checkbox"/>	
6. Schedule frequent short breaks for workers under shade	<input type="checkbox"/>	<input type="checkbox"/>	
Adequate Water Intake	Yes	No	Follow-up
7. Provide drinking water supply / facilities at locations near work areas and under shade (e.g. provide cold drinks to outdoor workers via water cooler, vending machines, cold drinks in cooler boxes)	<input type="checkbox"/>	<input type="checkbox"/>	



WSH Guidelines on “Managing Heat Stress in the Workplace”



Poster for “Monitor and Manage Heat Stress at Workplace”



FAQs on Heat Stress Measures for Outdoor Workers



Heat Stress Measures for Outdoor Work



Press Release on Enhanced Measures to Reduce Heat Stress for Outdoor Workers



Thank You

