

BEAT THE HEAT:

Avoiding heat stress in workplaces

WAH Symposium 2022



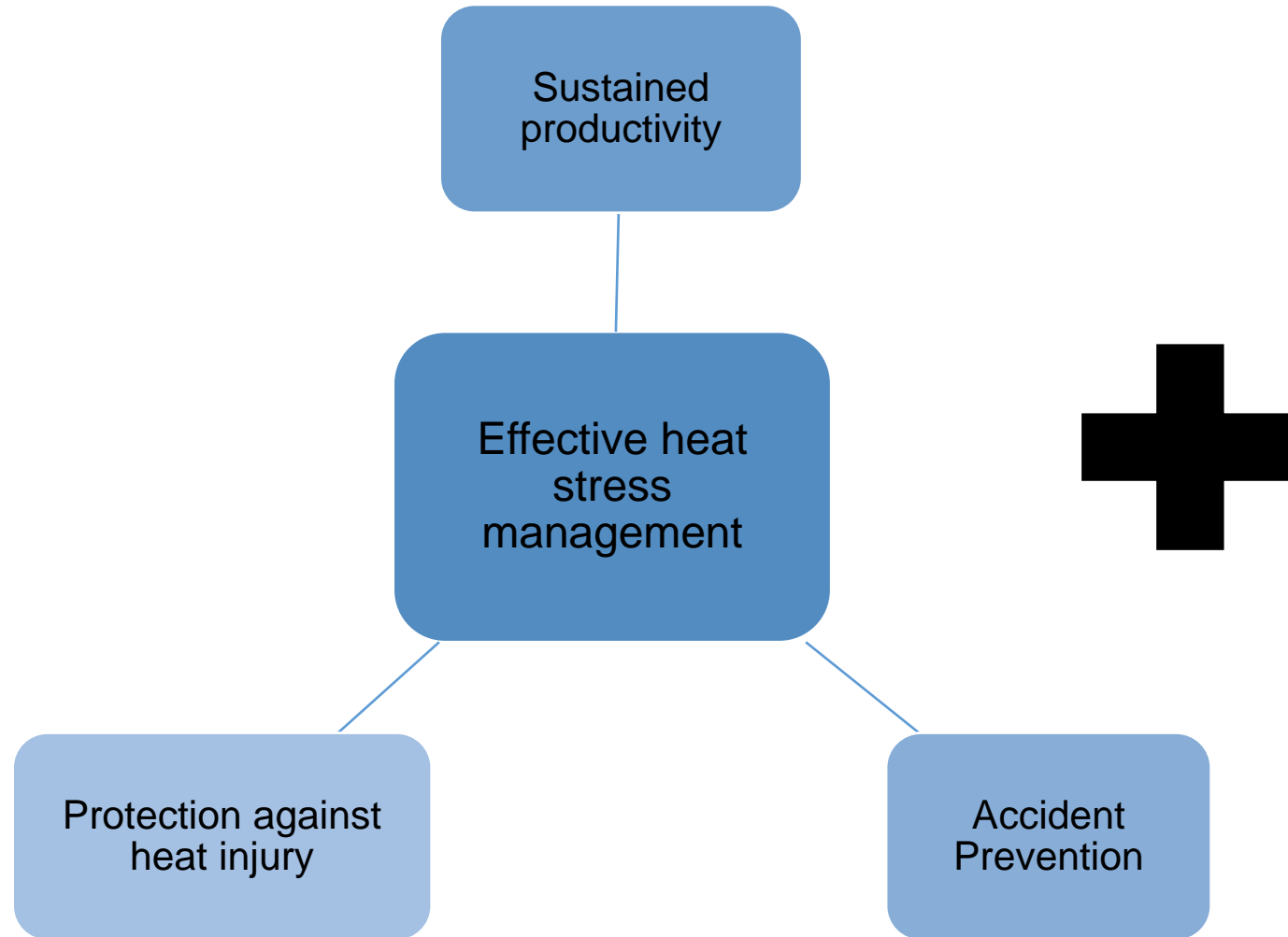
MINISTRY OF
MANPOWER

Dr. Zeenathnisa Aribou
Occupational Safety and Health Division
01/03/2022



A Great Workforce A Great Workplace

Overview of Heat Stress: Why



Workplace Safety and Health (WSH) Act

- All stakeholders are reminded that they are responsible under the WSH Act to ensure that measures are taken to minimize the risk of heat injuries among workers
- WSH (Risk Management) regulations require all workplaces to conduct risk assessments and take necessary measures to eliminate or reduce workplace risks, including the risk of heat injuries



CASE STUDY :



What is Heat Stress
How can one prevent it?

1

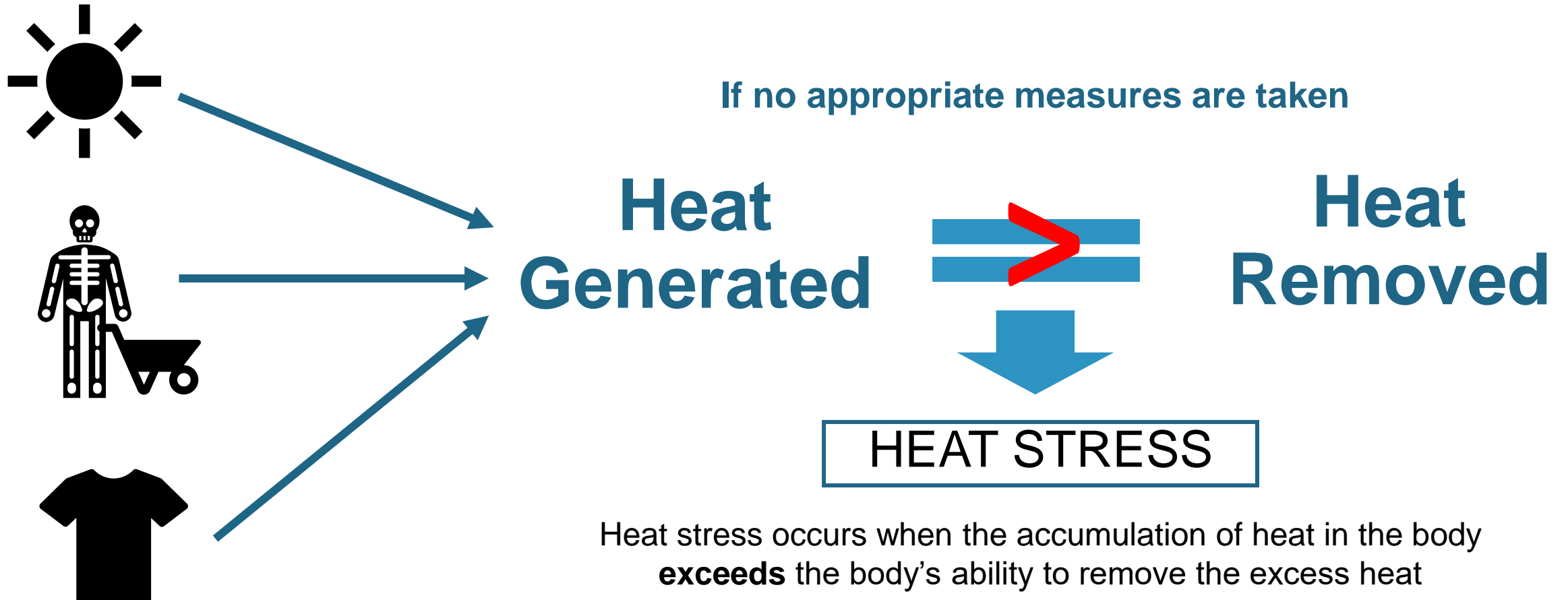


Figure 13: Location where the worker was stationed on the day of the incident.

- A construction worker was erecting formwork for the retention tanks at an open area of a construction site
- Worker was walking unsteadily and sitting down on the ground



Overview of Heat Stress: What



Overview of Heat Stress: What

Risk factors of Heat Stress



Job risk factors

- Workload severity and duration
- Worker clothing



Environmental Risk factors

- Direct Heat Source
- Ambient Temperature
- Ambient Humidity
- Air movement



Personal Risk factors

- Heat Acclimatization
- Medical conditions
 - Recent illness
 - Pre-existing medical conditions
- Chronic medications
- History of heat injury
- Obesity
- Other factors
 - Fitness levels
 - Sleep deprivation
 - Alcohol consumption



Overview of Heat Stress: What

Clinical signs and symptoms

EARLY



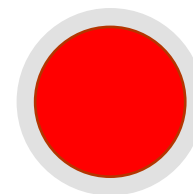
Heat Cramps

- Muscle cramps and spasms



Heat Exhaustion

- Feeling weak, dizziness or fainting
- Headaches
- Blurring of vision
- Abdominal pain, nausea, vomiting and diarrhoea



Heat Stroke

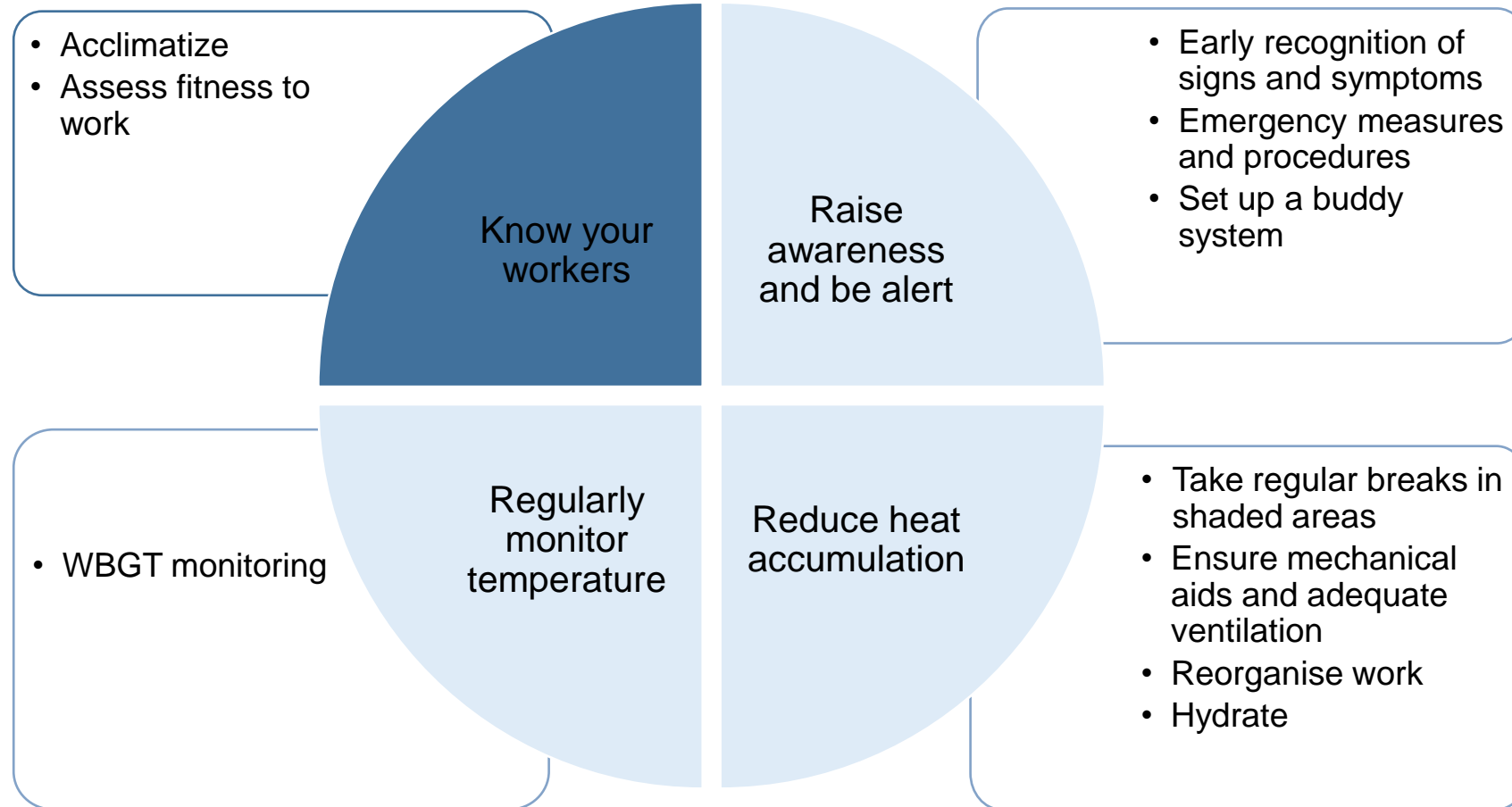
- Incoherent or unable to talk clearly
- Unconscious
- Loss control of the bladder and bowel functions
- Damage to vital organs such as brain, kidney and liver

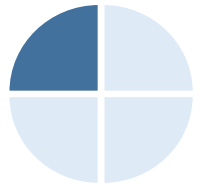
LIFE THREATENING



Overview of Heat Stress: How

Heat Stress Management Programme





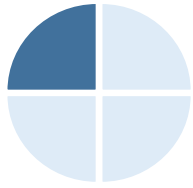
Heat Stress Management Programme

KNOW YOUR WORKERS

1. Fitness to work

- Workers should pass pre-employment medical examinations
- Workers returning from prolonged illness should be certified fit to work by a medical doctor
- Continued monitoring of workers' health is important





Heat Stress Management Programme

KNOW YOUR WORKERS

2. Acclimatization

WHO

- Newly assigned workers must be acclimatized to the hot weather or hot working conditions
- Workers returning from a long vacation or prolonged leave (more than a week) may need *re-acclimatization*

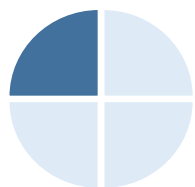
HOW LONG

- Workers would need at **least 1-2 weeks** to adjust to the local weather conditions and workload

WHY

- Will allow the workers to adapt to the new working environment and improve his/her tolerance to heat
- Has a positive impact on endurance capacity and greater productivity at the workplace

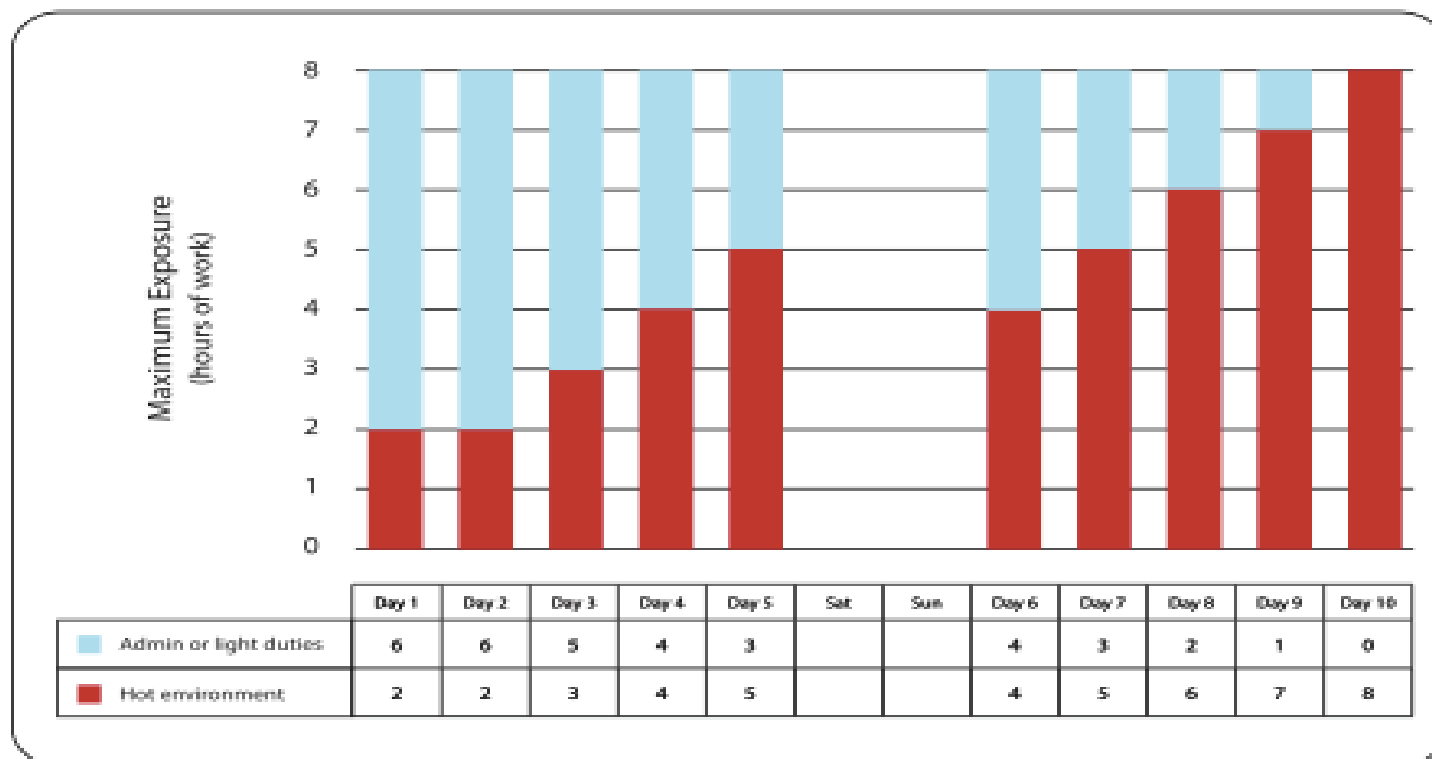




Heat Stress Management Programme

KNOW YOUR WORKERS

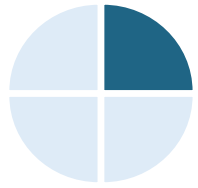
2. Acclimatization – HOW?



- Takes form of a gradual increase in daily exposure to the hot working environment for up to 14 days
- Workers should be supervised and allowed more rest
- Acclimatization progress may vary hence individual tailoring is important

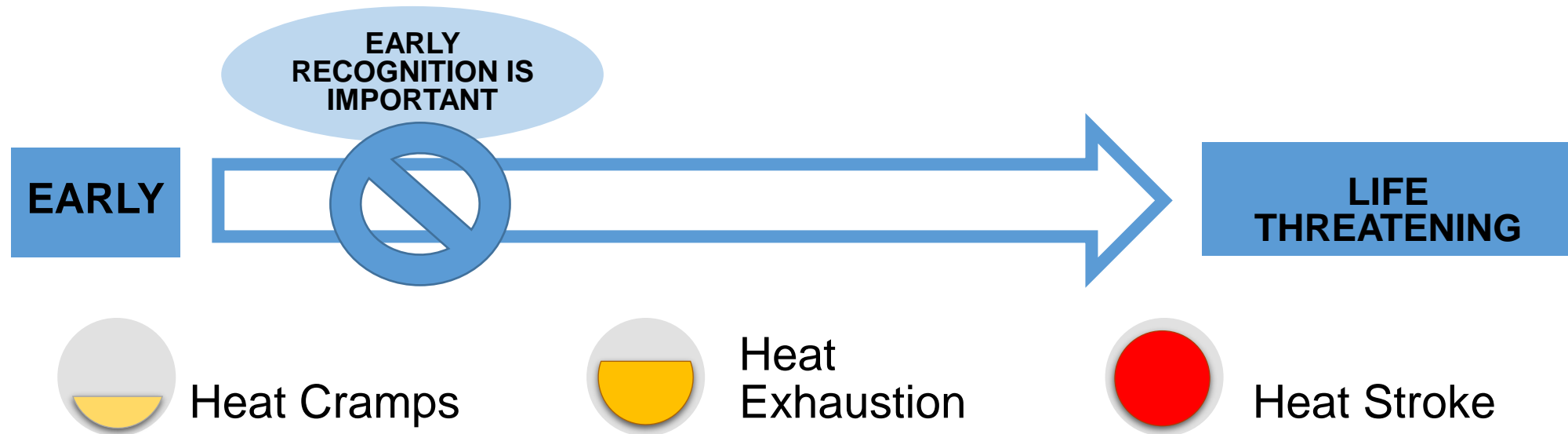
Figure 4: Example of heat acclimatisation schedule over two weeks assuming an 8-hour workday.





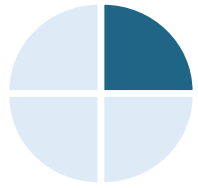
Heat Stress Management Programme

RAISE AWARENESS AND BE ALERT



- Workers should be educated on the hazards of working in a hot environment
- Workers should be aware of the emergency procedures on-site





Heat Stress Management Programme

RAISE AWARENESS AND BE ALERT

FIRST AID MEASURES

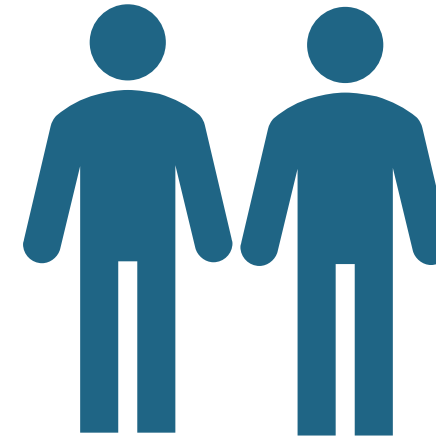
7R Approach

The 7R approach to first-aid treatment for heat stress is as follows:

R ecognise symptoms	Recognise symptoms of heat stress and report early.
R est casualty	Get the worker to sit or lie down in a cool shaded area with good ventilation.
R emove clothing	Loosen or remove excess clothing as appropriate (while preserving the modesty of the worker).
R educe temperature	Reduce body temperature as fast as possible by applying ice packs, wet towels or cool water. Other measures include fanning the casualty (to promote evaporative cooling), the use of cooling blankets and subjecting the worker to cold water immersion.
R ehydrate	Rehydrate by providing fluids. If casualty is unconscious, do not provide fluids by mouth as this may result in choking.
R esuscitate	If the worker becomes unconscious, call for help immediately and resuscitate using principles of cardiopulmonary resuscitation (CPR) if first-aiders are trained to do so.
R ush to hospital	Rush worker to the nearest hospital if the worker is not alert.

Table 8: First-aid treatment for heat injuries using the 7R approach.

SET UP A BUDDY SYSTEM



Workers should look out for one another and know what to do if a fellow worker show signs of heat injuries

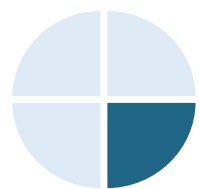


Heat Stress Management Programme

REDUCE HEAT ACCUMULATION

	Recommendations	Intention
Shaded Rest Area	<ul style="list-style-type: none"> Shaded area with good airflow should be provided for workers who spend a significant amount of time under the sun 	Reduce time in the heat
Water hydration	<ul style="list-style-type: none"> Encourage workers to hydrated throughout the day to quench their thirst Provide easy access water points 	Increase heat removal
Worker Clothing	<ul style="list-style-type: none"> Breathable clothing that is loose fitting and light colored 	Reduce heat accumulation





Heat Stress Management Programme

REDUCE HEAT ACCUMULATION

Recommendations		Intention
Use of Mechanical Aids	<ul style="list-style-type: none"> Use of mechanical aids e.g., lifting equipment, trolleys and power tools, may be used to reduce the physical workload posed on the worker 	<ul style="list-style-type: none"> Reduce heavy exertion and metabolic heat generated during the work activity
Work –Scheduling	<ul style="list-style-type: none"> Work tasks should be scheduled to reduce a worker's exposure to high heat stress conditions . Scheduling heavy physical work or work under direct sun to the cooler parts of the day 	<ul style="list-style-type: none"> Reduce worker's overall exposure to heat Minimise over-exertion and metabolic heat generated





Heat Stress Management Programme

REGULAR MONITORING

- WBGT is based on a measure of environment
- Needs to be measured at worksite representative of the environment
- WBGT measurement should be measured at multiple locations if the work area is large
- A good practice would be to monitor prior to work commencement and during work

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



Key points

To obtain a WBGT meter and calibrate before use

Table 5: Level of heat stress based on WBGT.



Heat Stress Management Programme

9. Heat Stress Prevention Checklist

The below checklist may be used for both indoor and outdoor hot working environments:

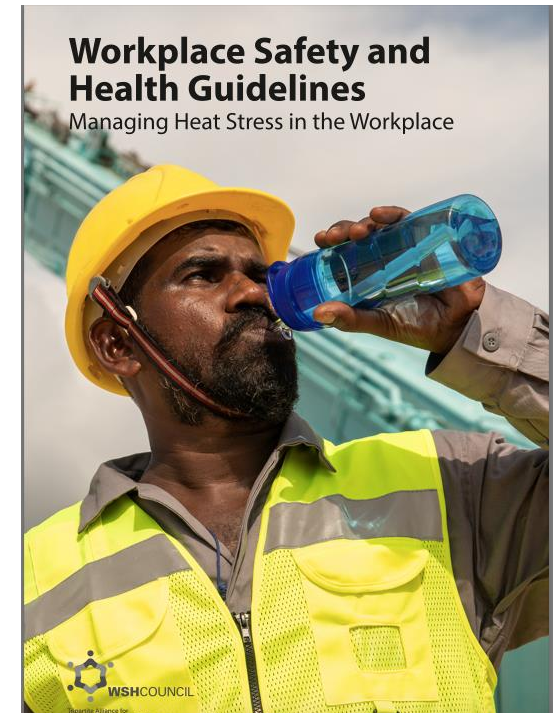
Preventing Heat Stress

Preventive Measures	Yes	No/NA	Remarks
Risk Assessment			
Does your RA cover work in a hot environment?			
Has an evaluation of the potential for heat injury been carried out based on a suitable heat stress index?			
Have all the heat sources e.g. hot machines, equipment, pipes, in the work area been identified?			
Fitness to Work			
Have all workers passed their pre-employment medical examination?			
Are supervisors checking for workers who are feeling unwell prior to starting work?			
Have workers, who have been ill, been certified by a doctor to be fit to return to work?			
Heat Acclimatisation			
Are new workers acclimatised to work in a hot environment?			
Are workers returning from prolonged leave, prolonged illness or returning from a colder climate, reacclimatised to work in a hot environment?			
Worker Clothing			
Are workers wearing loose-fitting and light-coloured clothing?			
Work Scheduling			
Is heavy physical work or work under direct sun scheduled to the cooler parts of the day?			
Is there work rotation for workers exposed to hot working conditions?			
Are workers allowed to take additional rest breaks in very hot weather or after carrying out heavy physical work?			
Adequate Water Intake			
Do workers have ready access to cool drinking water?			
Have the workers been advised to stay hydrated throughout the day?			
Rest Area			
Is there a cool or shaded area where workers can rest?			

Preventive Measures	Yes	No/NA	Remarks
Use of Mechanical Aids			
Are mechanical aids e.g. lifting equipment and power tools used to reduce the worker's physical workload?			
Workplace Ventilation			
Is there adequate ventilation (natural or mechanical) in the work area?			
Insulation/Shielding of Heat Sources			
Are hot machines, equipment and pipes insulated and/or shielded to minimise heat transfer to the work environment?			
Worker Awareness			
Have the workers been advised to report to their supervisor and/or see a medical doctor if they are feeling unwell?			
Are the workers aware of the heat injury preventive measures they can take before starting work?			
Are WSH officers, supervisors, workers and appointed first-aiders able to identify the signs and symptoms of heat injury?			
Are emergency procedures established, emergency supplies available and workers trained to render immediate on-site assistance?			



Scan QR code for *WSH Guidelines for Managing Heat Stress in the Workplace*



CASE STUDY 1:



Figure 13: Location where the worker was stationed on the day of the incident.

- A construction worker was erecting formwork for the retention tanks at an open area of a construction site
- Worker was walking unsteadily and sitting down on the ground
- Colleagues immediately transferred him to an air-conditioned area where his body was observed to be hot and dry
- Was given first aid immediately and transferred to hospital
- Had been feeling unwell with episodes of diarrhea and gastric discomfort three days prior to the incident

KEY POINTS

- **Risk factors: Hot weather and recent illness**
- Importance of re-acclimatization
- Early recognition of symptoms



KEY POINTS



Scan QR code for *WSH Guidelines
for Managing Heat Stress in the
Workplace*



WHAT

1. Heat Stress is a spectrum of symptoms and signs, progression may vary between individuals and early recognition is important

WHY

2. The risk of heat stress has negative implications on workers health and productivity and the risk is only going to increase in the coming years

HOW

3. Know your workers, raise awareness and be alert, regularly monitor temperature and reduce heat accumulation to reduce heat stress at workplace.



TOGETHER WE CAN BEAT THE HEAT



Scan QR code for *WSH Guidelines
for Managing Heat Stress in the
Workplace*



Thank you.



A Great Workforce A Great Workplace