



Heat-Related Illnesses

A Risk Easy to Battle

Training Hazard Area: Extreme Temperatures

Training Topic: Heat-related illnesses: recognition, prevention and treatment

Target Industries: Construction and general industries

Goal: To train students to recognize, prevent and treat heat-related illnesses resulting in fewer illnesses and deaths from working in extreme heat

Learning Objectives: Students will learn: 1) the signs and symptoms of heat stroke, heat exhaustion, heat cramps, hyponatremia and dehydration; 2) how to prevent heat-related illnesses when working in extreme heat indoors or outdoors; 3) how to treat heat-related illnesses; 4) employers and managers – how to develop and implement a heat acclimatization plan and reduce their employees' risks of developing heat-related illnesses

Languages: English and Spanish

Course Materials: Table 1 in the Appendix

Course Deliver Methods: Informal tabletop flip chart, formal PowerPoint presentations, short videos, worksheets, handouts and game. Can be taught in three separate sections: Recognition, prevention and treatment.

Environment: Can be taught indoors or outdoors utilizing different course materials

Evaluation Materials: Pre and post assessments, class examinations and class evaluations

Class Length: 20 – 60 minutes or longer depending on materials and method used

Handouts: Three handouts: NOAA's National Weather Service Heat Index Chart, NOAA's National Weather Service Heat Index Chart for Low Humidity and Are You Hydrated? – urine color chart.

Promotional Material: Two 8 x 10 flyers in English and Spanish to promote the training classes.

Workplace Posters: 1) Three 11 x 17 posters that can also be printed 8 x 10 Topics: Reminding workers to cool down frequently to avoid heat-related illnesses, reminding workers to prevent heat-related illnesses and reminding workers to stay hydrated to prevent heat-related illnesses. 2) Two 8 x 10 posters. Topics: Recognizing and treating heat-related illnesses and recognizing and treating heat exhaustion and heat stroke.

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| Course Matrix | |
|---|---|
| <i>Training Venue: Small informal group indoors or outdoors</i> | |
| Presentation Materials | <p>Sign in sheets</p> <p>Tabletop Flip Chart: Should be printed out, laminated and spiral bound. The instructor's notes are on one side and the class material on the other side.</p> <p>Videos: Three short videos on recognition, prevention and treatment that can be shown on an iPad if desired.</p> <p>Handouts: NOAA heat index charts and urine color chart. Should be printed and laminated.</p> |
| Time | <p>20 – 60 minutes</p> <p>The tabletop flip chart is designed in three 20 minutes sections (recognition, prevention and treatment) that can be taught separately or all at once.</p> |
| Files | <p>SigininSheets_Spanish.docx</p> <p>SigininSheets_English.docx</p> <p>TableTop_FlipChart_English.pptx</p> <p>TableTop_FlipChart_Spanish.pptx</p> <p>Heat_Related_Illnesses_English.mp4</p> <p>Heat_Related_Illnesses_Spanish.mp4</p> <p>Treatment_English.mp4</p> <p>Treatment_Spanish.mp4</p> <p>Prevention_Spanish.mp4</p> <p>Prevention_English.mp4</p> <p>Handout_NOAA_Heat_Index_ES.docx</p> <p>Handout_NOAA_Low_Humidity_ES.docx</p> <p>Handout_Urine_Color_Chart_ES.docx</p> |
| <i>Training Venue: Small to medium size group of employees with activities</i> | |
| Presentation materials | <p>Sign in sheets</p> <p>Pre and post assessments</p> <p>PowerPoint presentation for employees</p> <p>PowerPoint presentation of case studies</p> <p>Videos: Three short videos on recognition, prevention and treatment that can be shown on an iPad if desired</p> <p>Handouts: NOAA heat index charts and urine color chart. Should be printed and laminated.</p> <p>Worksheets: Fill in the blank, true and false, work match and crossword puzzle.</p> <p>Game: Lotería</p> <p>Exam B</p> <p>Class evaluations</p> |
| Time | <p>20 – 120 minutes</p> <p>The PowerPoint presentation is designed in three 20 minutes sections (recognition, prevention and treatment) that can be taught separately</p> |

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| Course Matrix | |
|---|---|
| | or all at once. The case studies can be discussed if desired. Completing the worksheets and the crossword puzzle and/or playing Lotería will add time to the training course but will also increase retention. |
| Files | SigininSheets_Spanish.docx SigininSheets_English.docx PrePostAssessments_English.docx PrePostAssessments_Spanish.docx Heat_Related_Illnesses_Employee_English.pptx Heat_Related_Illnesses_Employee_Spanish.pptx CaseStudies_English.pptx CaseStudies_Spanish.pptx Worksheets_Spanish.docx Worksheets_English.docx Crossword_Puzzle_English.docx Crossword_Puzzle_Spanish.docx GameLotería_English.docx GameLotería_Spanish.docx Heat_Related_Illnesses_English.mp4 Heat_Related_Illnesses_Spanish.mp4 Treatment_English.mp4 Treatment_Spanish.mp4 Prevention_Spanish.mp4 Prevention_English.mp4 Handout_NOAA_Heat_Index_ES.docx Handout_NOAA_Low_Humidity_ES.docx Handout_Urine_Color_Chart_ES.docx Exams_English.docx Exams_Spanish.docx Training_Evaluation_English.docx Training_Evaluation_Spanish.docx |
| <i>Training Venue: Small to medium size group of employers or managers with activities</i> | |
| Presentation materials | Sign in sheets Pre and post assessments PowerPoint presentation for employers or managers PowerPoint presentation of case studies Videos: Three short videos on recognition, prevention and treatment that can be shown on an iPad if desired Handouts: NOAA heat index charts and urine color chart. Should be printed and laminated. Worksheets: Fill in the blank, true and false, work match and crossword puzzle. Game: Lotería Exam A Class evaluations |

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| Course Matrix | |
|--|---|
| Time | 20 – 120 minutes The PowerPoint presentation is designed in three 20 minutes sections (recognition, prevention and treatment) that can be taught separately or all at once. Completing the worksheets and the crossword puzzle and/or playing Lotería will add time to the training course but will also increase retention. The case studies can be discussed if desired. |
| Files | SigninSheets_Spanish.docx SigninSheets_English.docx PrePostAssessments_English.docx PrePostAssessments_Spanish.docx Heat_Related_Illnesses_Manager_English.pptx Heat_Related_Illnesses_Manager_Spanish.pptx CaseStudies_English.pptx CaseStudies_Spanish.pptx Worksheets_Spanish.docx Worksheets_English.docx Crossword_Puzzle_English.docx Crossword_Puzzle_Spanish.docx GameLotería_English.docx GameLotería_Spanish.docx Heat_Related_Illnesses_English.mp4 Heat_Related_Illnesses_Spanish.mp4 Treatment_English.mp4 Treatment_Spanish.mp4 Prevention_Spanish.mp4 Prevention_English.mp4 Handout_NOAA_Heat_Index_ES.docx Handout_NOAA_Low_Humidity_ES.docx Handout_Urine_Color_Chart_ES.docx Exams_English.docx Exams_Spanish.docx Training_Evaluation_English.docx Training_Evaluation_Spanish.docx |
| <i>Training Venue : Lecture</i> | |
| Presentation materials | Sign in sheets PowerPoint presentation for employers or managers PowerPoint presentation of case studies Videos: Three short videos on recognition, prevention and treatment that can be shown on an iPad if desired Handouts: NOAA heat index charts and urine color chart. Should be printed and laminated. Class evaluations |
| Time | 20 – 120 minutes |

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| Course Matrix | |
|----------------------|--|
| | The PowerPoint presentations are designed in three 20 minutes sections (recognition, prevention and treatment) that can be taught separately or all at once. The case studies can be discussed if desired. |
| Files | SigininSheets_Spanish.docx SigininSheets_English.docx Heat_Related_Illnesses_Employee_English.pptx Heat_Related_Illnesses_Employee_Spanish.pptx Heat_Related_Illnesses_Manager_English.pptx Heat_Related_Illnesses_Manager_Spanish.pptx CaseStudies_English.pptx CaseStudies_Spanish.pptx Heat_Related_Illnesses_English.mp4 Heat_Related_Illnesses_Spanish.mp4 Treatment_English.mp4 Treatment_Spanish.mp4 Prevention_Spanish.mp4 Prevention_English.mp4 |

References

Bennett, B.L., Hew-Butler, T., Hoffman, M.D., Rogers, I.R. and M.H. Rosner. "Wilderness Medical Society Practice Guidelines for Treatment of Exercise-Associated Hyponatremia: 2014 Update". *Wilderness & Environmental Medicine*, 2014, 25, S30-S42.

Jacklitsch, B., Williams, W.J., Musolins, K., Coca, A., Kim, J. and N. Turner. "Criteria for a Recommended Standard, Occupational Exposure to Heat and Hot Environments". Revised 2016. Department of Health and Human Services, Centers for Disease Control and Prevention, National Institute for Occupational Safety and Health.

Lipman, G.S., Gaudio, F.G., Eifling, K.P., Ellis, M.A., Otten, E.M. and C.K. Grissom. "Wilderness Medical Society Practice Guidelines for Prevention and Treatment of Heat Illness: 2019 Update". *Wilderness & Environmental Medicine*, 2018, 00(00):1-14.

Urso, C., Brucculeri, S. and G. Caimi. "Physiopathological, Epidemiological, Clinical and Therapeutic Aspects of Exercise-Associated Hyponatremia:". *Journal of Clinical Medicine*, 2014, 3, 1258-1275.

Appendix 1.

| Table 1: Heat-Related Illnesses Course Materials | |
|--|---|
| File | Description |
| CaseStudies_English.pptx | Case Studies in English |
| CaseStudies_Spanish.pptx | Case Studies in Spanish |
| Crossword_Puzzle_English.docx | Crossword Puzzle in English |
| Crossword_Puzzle_Spanish.docx | Crossword Puzzle in Spanish |
| Exams_English.docx | Final exams in English Exam A – designed for managers and employers Exam B – designed for workers |
| Exams_Spanish.docx | Final exams in English Exam A – designed for managers and employers Exam B – designed for workers |
| GameLotería_English.docx | The game Lotería in English. A traditional game of chance, similar to bingo but using pictures instead of numbers. |
| GameLotería_Spanish.docx | The game Lotería in Spanish. A traditional game of chance, similar to bingo but using pictures instead of numbers. |
| Handout_NOAA_Heat_Index_ES.docx | Handout - NOAA's National Weather Service Heat Index Chart: Temperature versus relative humidity. How hot it really feels hot it really feels when the effects of humidity are added to high temperature. Can be printed out, laminated and cut in two. English on one side. Spanish on the other. |
| Handout_NOAA_Low_Humidity_ES.docx | Handout - NOAA's National Weather Service Heat Index Chart for Low Humidity: Temperature versus relative humidity. More appropriate for the southwest. How hot it really feels hot it really feels when the effects of humidity are added to high temperature. Can be printed out, laminated and cut in two. English on one side. Spanish on the other. |
| Handout_Urine_Color_Chart_ES.docx | Handout – Are You Hydrated? Gives a urine color chart that can be used by workers to see if they are hydrated. Can be printed out, laminated and cut in two. English on one side. Spanish on the other. |
| Heat_Related_Illnesses_English.mp4 | Video in English on the recognition of heat-related illnesses. |
| Heat_Related_Illnesses_Spanish.mp4 | Video in Spanish on the recognition of heat-related illnesses. |

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| Table 1: Heat-Related Illnesses Course Materials | |
|---|---|
| Heat_Related_Illnesses_Employee_English.pptx | PowerPoint presentation in English on the recognition, prevention and treatment of heat-related illnesses designed for employees. Suitable for all audiences but does not over employer responsibilities. |
| Heat_Related_Illnesses_Employee_Spanish.pptx | PowerPoint presentation in Spanish on the recognition, prevention and treatment of heat-related illnesses designed for employees. Suitable for all audiences but does not over employer responsibilities. |
| Heat_Related_Illnesses_Manager_English.pptx | PowerPoint presentation in English on the recognition, prevention and treatment of heat-related illnesses designed for employers or managers. |
| Heat_Related_Illnesses_Manager_Spanish.pptx | PowerPoint presentation in Spanish on the recognition, prevention and treatment of heat-related illnesses designed for employers or managers. |
| Heat_Related_Illnesses_Poster_English.docx | 8 x 10 poster in English that summarizes heat-related illnesses and treatment. |
| Heat_Related_Illnesses_Poster_Spanish.docx | 8 x 10 poster in Spanish that summarizes heat-related illnesses and treatment. |
| Heat_Stroke_Exhaustion_Poster_English.docx | 8 x 10 poster in English that summarizes the difference between the signs, symptoms and treatment of heat stroke and heat exhaustion. |
| Heat_Stroke_Exhaustion_Poster_Spanish.docx | 8 x 10 poster in Spanish that summarizes the difference between the signs, symptoms and treatment of heat stroke and heat exhaustion. |
| Course_Manual.docx | Course manual that contains description and use of all course materials. |
| Prevention_English.mp4 | Video in English on the prevention of heat-related illnesses. |
| Prevention_Spanish.mp4 | Video in Spanish on the prevention of heat-related illnesses. |
| Poster_Cool_ES.pptx | 11 x 17 poster that reminds workers to cool down frequently to avoid heat-related illnesses. English and Spanish both in file. Can be printed on 8 x 10. |
| Poster_Heat_Illness_ES.pptx | 11 x 17 poster that reminds workers to prevent heat-related illnesses. English and Spanish both in file. Can be printed on 8 x 10. |
| Poster_Hydration_ES.pptx | 11 x 17 poster that reminds workers to stay hydrated to prevent heat-related illnesses. |

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| Table 1: Heat-Related Illnesses Course Materials | |
|--|---|
| | English and Spanish both in file. Can be printed on 8 x 10. |
| PrePostAssessments_English.docx | Pre- and Post- assessments in English to measure learning student learning. |
| PrePostAssessments_Spanish.docx | Pre- and Post- assessments in Spanish to measure learning student learning. |
| Promotional_Flyers_ES.pptx | Two 8 x 10 flyers in English and Spanish to promote the training classes. |
| SigininSheets_Spanish.docx | Sign in sheets in Spanish for students attending training class. |
| SigininSheets_English.docx | Sign in sheets in English for students attending training class. |
| TableTop_FlipChart_English.pptx | Tabletop flip chart in English best for small informal groups. Should be printed out, laminated and spiral bound. |
| TableTop_FlipChart_Spanish.pptx | Tabletop flip chart in Spanish best for small informal groups. Should be printed out, laminated and spiral bound. |
| Training_Evaluation_English.docx | Training evaluation form in English. |
| Training_Evaluation_Spanish.docx | Training evaluation form in Spanish. |
| Treatment_English.mp4 | Video in English on the treatment of heat-related illnesses. |
| Treatment_Spanish.mp4 | Video in English on the treatment of heat-related illnesses. |
| Worksheets_Spanish.docx | Three worksheets in Spanish: fill in the blank, true and false, word match. |
| Worksheets_English.docx | Three worksheets in Course: fill in the blank, true and false, word match. |

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SIGN IN SHEET

Heat-Related Illnesses: Identification, Prevention and Treatment

Instructors: _____

Location: _____

Date: _____ Start Time: _____ End Time: _____

| # | Printed Name | Signature | Email/Telephone # |
|----|--------------|-----------|-------------------|
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| # | Printed Name | Signature | Email/Telephone # |
|----|--------------|-----------|-------------------|
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trainee assessments on subject matter knowledge and skills immediately before and after

the training (level 2), **PRE-ASSESSMENT**

Heat-Related Illnesses: Recognition, Prevention and Treatment

Name: _____

Date: _____

This pre-assessment is designed to determine what you already know about heat-related illnesses and their identification, treatment and prevention. You will be asked to complete this assessment again at the end of the training so that we can assess what you have learned and how well the trainer has communicated the main points. This is not a test and you will not be graded on your performance.

TRUE AND FALSE: Are these phrases true or false? Circle the correct answer. T for True and F for False.

1. T F Heat-related illnesses are serious medical conditions and sometimes can even be fatal.
2. T F As long as you are sweating you will not get a heat-related illness, since sweating is the body's natural cooling mechanism.
3. T F The best way to prevent heat-related illnesses is to take salt tablets before working in a hot environment.
4. T F If you will be working in the heat for over 2 hours you should drink a cool cup of water every 15 to 20 minutes.
5. T F You can get a heat-related illness if you are working in an indoor hot area.

MULTIPLE CHOICE: Choose the best answer for each multiple-choice question. There is only one best answer for each question.

1. Workers acclimatize or become more tolerant of working in heat:
 - a. Over three weeks
 - b. Only when working at least 8 hours a day for 3 days in heat
 - c. Over 7 to 14 days
 - d. Over 2 to 3 days
2. To help prevent heat-related illnesses when working in a hot area, you should:
 - a. Drink several cups of coffee the morning before working in the heat
 - b. Drink plenty of fluids and take frequent breaks
 - c. Avoid eating large meals while working

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- d. Wear several layers of clothing
3. If you believe that your coworker may be suffering from heat exhaustion, one of the first steps you should take is to:
- a. Break for lunch
 - b. Move your coworker out of the heat and into a shady or cool area
 - c. Check their pulse and see if it is over 90 beats per minute
 - d. Remind them to drink plenty of fluids
4. If a worker is suffering from heat stroke, you should:
- a. Refrain from touching the worker because they may have a seizure
 - b. Check to see if they are sweating
 - c. Monitor their breathing and begin CPR
 - d. Call 911 and cool the worker
5. To help prevent heat related illnesses wear:
- a. Lightweight, loose-fitting, light-colored clothing that allows sweat to evaporate and a light-colored wide-brimmed hat
 - b. Personal protective equipment
 - c. Dark-colored clothing that absorbs the heat
 - d. A light-colored wide-brimmed hat and any type or color of clothing

FILL IN THE BLANK: Choose the best word or phrase from the list below to complete the sentences.

dehydration
heat cramps
heat exhaustion
heat stroke
hyponatremia

1. A headache, nausea, dizziness, heavy sweating, irritability, thirst and an elevated body temperature are all signs and symptoms of _____.
2. A worker suffering from _____ may seem confused and have slurred speech and hot, dry, red skin.
3. When workers have been sweating heavily during hot work and not replacing the electrolytes lost in sweat, they may experience _____.
4. If you drink too much water during hot work and do not eat salty snacks and drink sports drinks, you may suffer from _____.
5. _____ occurs when you lose more fluid than you are taking in, and you may have a headache, feel dizzy and not urinate frequently.

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POST-ASSESSMENT

Heat-Related Illnesses: Recognition, Prevention and Treatment

Name: _____

Date: _____

TRUE AND FALSE: Are these phrases true or false? Circle the correct answer. T for True and F for False.

1. T F Heat-related illnesses are serious medical conditions and sometimes can even be fatal.
2. T F As long as you are sweating you will not get a heat-related illness, since sweating is the body's natural cooling mechanism.
3. T F The best way to prevent heat-related illnesses is to take salt tablets before working in a hot environment.
4. T F If you will be working in the heat for over 2 hours you should drink a cool cup of water every 15 to 20 minutes.
5. T F You can get a heat-related illness if you are working in an indoor hot area.

MULTIPLE CHOICE: Choose the best answer for each multiple-choice question. There is only one best answer for each question.

1. Workers acclimatize or become more tolerant of working in heat:
 - a. Over three weeks
 - b. Only when working at least 8 hours a day for 3 days in heat
 - c. Over 7 to 14 days
 - d. Over 2 to 3 days
2. To help prevent heat-related illnesses when working in a hot area, you should:
 - a. Drink several cups of coffee the morning before working in the heat
 - b. Drink plenty of fluids and take frequent breaks
 - c. Avoid eating large meals while working
 - d. Wear several layers of clothing

3. If you believe that your coworker may be suffering from heat exhaustion, one of the first steps you should take is to:
 - a. Break for lunch
 - b. Move your coworker out of the heat and into a shady or cool area
 - c. Check their pulse and see if it is over 90 beats per minute
 - d. Remind them to drink plenty of fluids
4. If a worker is suffering from heat stroke, you should:
 - a. Refrain from touching the worker because they may have a seizure
 - b. Check to see if they are sweating
 - c. Monitor their breathing and begin CPR
 - d. Call 911 and cool the worker
5. To help prevent heat related illnesses wear:
 - a. Lightweight, loose-fitting, light-colored clothing that allows sweat to evaporate and a light-colored wide-brimmed hat
 - b. Personal protective equipment
 - c. Dark-colored clothing that absorbs the heat
 - d. A light-colored wide-brimmed hat and any type or color of clothing

FILL IN THE BLANK: Choose the best word or phrase from the list below to complete the sentences.

dehydration
heat cramps
heat exhaustion
heat stroke
hyponatremia

1. A headache, nausea, dizziness, heavy sweating, irritability, thirst and an elevated body temperature are all signs and symptoms of _____.
2. A worker suffering from _____ may seem confused and have slurred speech and hot, dry, red skin.
3. When workers have been sweating heavily during hot work and not replacing the electrolytes lost in sweat, they may experience _____.
4. If you drink too much water during hot work and do not eat salty snacks and drink sports drinks, you may suffer from _____.
5. _____ occurs when you lose more fluid than you are taking in, and you may have a headache, feel dizzy and not urinate frequently.

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PRE/POST-ASSESSMENT - ANSWER KEY

Heat-Related Illnesses: Recognition, Prevention and Treatment

TRUE AND FALSE: Are these phrases true or false? Circle the correct answer. T for True and F for False.

1. **True** Heat-related illnesses are serious medical conditions and sometimes can even be fatal.
2. **False** As long as you are sweating you will not get a heat-related illness, since sweating is the body's natural cooling mechanism.
3. **False** The best way to prevent heat-related illnesses is to take salt tablets before working in a hot environment.
4. **True** If you will be working in the heat for over 2 hours you should drink a cool cup of water every 15 to 20 minutes.
5. **True** You can get a heat-related illness if you are working in an indoor hot area.

MULTIPLE CHOICE: Choose the best answer for each multiple-choice question. There is only one best answer for each question.

1. Workers acclimatize or become more tolerant of working in heat:
 - a. Over three weeks
 - b. Only when working at least 8 hours a day for 3 days in heat
 - c. **Over 7 to 14 days**
 - d. Over 2 to 3 days
2. To help prevent heat-related illnesses when working in a hot area, you should:
 - a. Drink several cups of coffee the morning before working in the heat
 - b. **Drink plenty of fluids and take frequent breaks**
 - c. Avoid eating large meals while working
 - d. Wear several layers of clothing
3. If you believe that your coworker may be suffering from heat exhaustion, one of the first steps you should take is to:
 - a. Break for lunch
 - b. **Move your coworker out of the heat and into a shady or cool area**
 - c. Check their pulse and see if it is over 90 beats per minute
 - d. Remind them to drink plenty of fluids

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4. If a worker is suffering from heat stroke, you should:
 - a. Refrain from touching the worker because they may have a seizure
 - b. Check to see if they are sweating
 - c. Monitor their breathing and begin CPR
 - d. **Call 911 and cool the worker**

5. To help prevent heat related illnesses wear:
 - a. **Lightweight, loose-fitting, light-colored clothing that allows sweat to evaporate and a light-colored wide-brimmed hat**
 - b. Personal protective equipment
 - c. Dark-colored clothing that absorbs the heat
 - d. A light-colored wide-brimmed hat and any type or color of clothing

FILL IN THE BLANK: Choose the best word or phrase from the list below to complete the sentences.

dehydration
heat cramps
heat exhaustion
heat stroke
hyponatremia

1. A headache, nausea, dizziness, heavy sweating, irritability, thirst and an elevated body temperature are all signs and symptoms of heat exhaustion.

2. A worker suffering from heat stroke may seem confused and have slurred speech and hot, dry, red skin.

3. When workers have been sweating heavily during hot work and not replacing the electrolytes lost in sweat, they may experience heat cramps.

4. If you drink too much water during hot work and do not eat salty snacks and drink sports drinks, you may suffer from hyponatremia.

5. Dehydration occurs when you lose more fluid than you are taking in, and you may have a headache, feel dizzy and not urinate frequently.



FILL IN THE BLANK

Choose the best word or phrase from the list below to complete the sentences and learn more about heat-related illness.

7 to 14
alcohol
headache
indoors
thirsty

absence
construction industry
hot area
shade
water

acclimatization plan
heat stroke
hyponatremia
sweating

1. An _____ should be implemented at all workplaces where workers are exposed to heat.
2. Gradually increase work time in hot environments over a period of _____ days.
3. Heat acclimatization increases _____ and therefore workers will have an increased need for _____.
4. In 2010 the largest number of workers died from heat-related illnesses in the _____.
5. _____ may occur from drinking large quantities of water accompanied by significant loss of sodium from sweating.
6. Drinking _____ during work in the heat reduces heat tolerance and increases the risk of heat-related illnesses.
7. _____ is a medical emergency, and you should call 911.
8. _____ from work in the heat for a week or more results in a significant loss in heat acclimatization.
9. It is possible to suffer from heat-related illnesses _____.
10. To reduce your risk of heat exhaustion, rest in the _____ frequently when working outdoors in the sun.
11. A person suffering from dehydration usually is _____ and often has a _____.
12. If your coworker is suffering from heat exhaustion remove him or her from the _____.



FILL IN THE BLANK ANSWER KEY

7 to 14
alcohol
headache
indoors
thirsty

absence
construction industry
hot area
shade
water

acclimatization plan
heat stroke
hyponatremia
sweating

1. An acclimatization plan should be implemented at all workplaces where workers are exposed to heat.
2. Gradually increase work time in hot environments over a period of 7 to 14 days.
3. Heat acclimatization increases sweating and therefore workers will have an increased need for water.
4. In 2010 the largest number of workers died from heat-related illnesses in the construction industry.
5. Hyponatremia may occur from drinking large quantities of water accompanied by significant loss of sodium from sweating.
6. Drinking alcohol during work in the heat reduces heat tolerance and increases the risk of heat-related illnesses.
7. Heat stroke is a medical emergency, and you should call 911.
8. Absence from work in the heat for a week or more results in a significant loss in heat acclimatization.
9. It is possible to suffer from heat-related illnesses indoors.
10. To reduce your risk of heat exhaustion, rest in the shade frequently when working outdoors in the sun.
11. A person suffering from dehydration usually is thirsty and often has a headache.
12. If your coworker is suffering from heat exhaustion remove him or her from the hot area.



TRUE OR FALSE

Check your knowledge. Are these phrases true or false?
Circle the correct answer. T for True and F for False.

1. T F Dehydration and lack of acclimatization can lead to heat syncope or fainting.
2. T F Workers who are obese are more susceptible to heat-related illnesses.
3. T F Heat-related illnesses never occur in indoor work environments.
4. T F Heat stroke is always a medical emergency.
5. T F You can cool a person's body quickly by immersing them up to the neck in cold water, placing them in a cold shower, or covering as much of their body as possible with cold, wet towels.
6. T F New workers who are not acclimatized to the heat should work the same outdoor schedule for the first few days as acclimatized workers.
7. T F Workers should be trained on how to prevent, recognize and treat heat-related illness.
8. T F Coffee and beer are the best fluids to drink to stay hydrated while working in extreme heat.
9. T F Older workers are more at risk for heat-related illnesses.
10. T F Gradually increase time working in hot areas over a period of 7 to 14 days to become acclimatized to the heat.
11. T F An indoor work environment can become a heat hazard if air conditioning is unavailable or ventilation is insufficient.
12. T F Hyponatremia is never a problem if you eat a good breakfast before working in extreme heat.
13. T F High humidity increases the risk of heat-related illnesses because it reduces the cooling of the body from the evaporation of sweat.
14. T F A buddy system can help prevent heat-related illnesses. Workers are not working alone, and they are monitoring each other for early signs and symptoms of heat intolerance.

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TRUE OR FALSE ANSWER KEY

1. **True** Dehydration and lack of acclimatization can lead to heat syncope or fainting.
2. **True** Workers who are obese are more susceptible to heat-related illnesses.
3. **False** Heat-related illnesses never occur in indoor work environments.
4. **True** Heat stroke is always a medical emergency.
5. **True** You can cool a person's body quickly by immersing them up to the neck in cold water, placing them in a cold shower, or covering as much of their body as possible with cold, wet towels.
6. **False** New workers who are not acclimatized to the heat should work the same outdoor schedule for the first few days as acclimatized workers.
7. **True** Workers should be trained on how to prevent, recognize and treat heat-related illness.
8. **False** Coffee and beer are the best fluids to drink to stay hydrated while working in extreme heat.
9. **True** Older workers are more at risk for heat-related illnesses.
10. **True** Gradually increase time working in hot areas over a period of 7 to 14 days to become acclimatized to the heat.
11. **True** An indoor work environment can become a heat hazard if air conditioning is unavailable or ventilation is insufficient.
12. **False** Hyponatremia is never a problem if you eat a good breakfast before working in extreme heat.
13. **True** High humidity increases the risk of heat-related illnesses because it reduces the cooling of the body from the evaporation of sweat.
14. **True** A buddy system can help prevent heat-related illnesses. Workers are not working alone, and they are monitoring each other for early signs and symptoms of heat intolerance.



WORD MATCH

Match the phrases on the left with their description on the right.

- | | |
|------------------------------|--|
| _____ 1. Heat stroke | A. Low sodium concentrations in the blood caused by drinking too much water and losing too much salt through sweating |
| _____ 2. Shade structure | B. Occurs when the water lost from sweating is not completely replaced |
| _____ 3. Adequate cool water | C. A medical emergency with a dramatic rise in body temperature that can be fatal |
| _____ 4. Hyponatremia | D. Drinking water less than 59°F provided in individual not communal drinking cups |
| _____ 5. Acclimatization | E. Minerals found in your blood, urine and sweat that are vital to keeping your body functioning as it should and include sodium, potassium, calcium and magnesium |
| _____ 6. Heat exhaustion | F. When workers are monitoring each other for early signs and symptoms of heat-related illnesses |
| _____ 7. Dehydration | G. Something to rest under when working outside in the sun |
| _____ 8. Hat with wide brim | H. Enhancing your heat tolerance over a period of time |
| _____ 9. Buddy system | I. How your body cools itself |
| _____ 10. Heat syncope | J. A heat-related illness which may include heavy sweating and pale, cool and clammy skin |
| _____ 11. Sweating | K. Worn to keep direct sun off your head and help prevent heat-related illnesses |
| _____ 12. Electrolytes | L. Fainting often caused by dehydration and lack of acclimatization |



WORD MATCH

ANSWER KEY

- | | |
|---------------------------------|--|
| <u>C</u> 1. Heat stroke | A. Low sodium concentrations in the blood caused by drinking too much water and losing too much salt through sweating |
| <u>G</u> 2. Shade structure | B. Occurs when the water lost from sweating is not completely replaced |
| <u>D</u> 3. Adequate cool water | C. A medical emergency with a dramatic rise in body temperature that can be fatal |
| <u>A</u> 4. Hyponatremia | D. Drinking water less than 59°F provided in individual not communal drinking cups |
| <u>H</u> 5. Acclimatization | E. Minerals found in your blood, urine and sweat that are vital to keeping your body functioning as it should and include sodium, potassium, calcium and magnesium |
| <u>J</u> 6. Heat exhaustion | F. When workers are monitoring each other for early signs and symptoms of heat-related illnesses |
| <u>B</u> 7. Dehydration | G. Something to rest under when working outside in the sun |
| <u>K</u> 8. Hat with wide brim | H. Enhancing your heat tolerance over a period of time |
| <u>F</u> 9. Buddy system | I. How your body cools itself |
| <u>L</u> 10. Heat syncope | J. A heat-related illness which may include heavy sweating and pale, cool and clammy skin |
| <u>I</u> 11. Sweating | K. Worn to keep direct sun off your head and help prevent heat-related illnesses |
| <u>E</u> 12. Electrolytes | L. Fainting often caused by dehydration and lack of acclimatization |



CASE STUDIES

Dehydration, Hyponatremia, Heat Cramps, Heat exhaustion or Heat Stroke

Read each of the case studies and discuss: 1) if you believe the worker is experiencing dehydration, hyponatremia, heat cramps, heat exhaustion or heat stroke and why, and 2) what first aid measures you would take if any.

1. You and your coworker have been working outside on a construction site for several hours. It's one of the first really hot days of the year. You notice that your coworker is really sweating a lot and looks a little pale. When you ask him how he is feeling, he tells you that he feels a little dizzy and nauseous.
2. Your coworker has just returned from a two-week vacation in a cooler climate. She told you that she was worried about coming back to work in the heat, so she drank as much water as she could last night and again this morning. At break she drank some more water and didn't eat anything. She now seems a little sluggish and says she feels tired and maybe a little nauseous. You've been working outside for over four hours.
3. You've been outside almost all afternoon on a hot day installing a new irrigation system. You notice that you've developed a headache and are thirsty.
4. Three of you have been installing a new roof on a house on a hot day. You started early, but it is taking longer than you expected to finish the installation. It's now late afternoon and you aren't finished. You sent one of your coworkers to the truck for more supplies, but he hasn't come back yet. You go to look for him and find him sitting in the driveway in the sun. He's seems confused, has a very red face and is sweating profusely. When you ask him what happened, he doesn't really respond.
5. You work in a foundry as a furnace operator. It's always really hot, but today the ventilation system isn't working well making it even hotter. Even the break room is hot. You see you coworker stumble a little and notice that he is sweating profusely. You ask him what's going on, and he tells you that he feels really hot and has a headache and is going to sit in the break room for a few minutes.
6. You and your coworker are installing pavers on a very hot day. All of a sudden, your coworker grabs her calf and says she just got a horrible cramp.
7. You have a new coworker who doesn't seem to be very physically fit. He also hasn't had much recent experience working outside on very hot and humid days. At the morning break he seemed a little irritable, so you were glad that you didn't have to work with him. Now it's late in the day, and all of a sudden you hear someone yell that the new coworker has just collapsed. You go over there, and see that he isn't responding to anyone and has a very red, dry face.



CASE STUDIES DISCUSSION

1. You and your coworker have been working outside on a construction site for several hours. It's one of the first really hot days of the year. You notice that your coworker is really sweating a lot and looks a little pale. When you ask him how he is feeling, he tells you that he feels a little dizzy and nauseous.

***Discussion:** Your coworker is showing signs and symptoms of **heat exhaustion**. It's the first hot day, so he may not be acclimatized to the heat yet, and you've been working outside for several hours. If medical care isn't available at your work site, call 911. Remove your coworker from the hot area by going into the shade or indoors to a cool environment. Remove any unnecessary clothing including shoes and socks. Place cold compresses on his head, face and neck. Have him sip cool water or a cool sports drink. Stay with him until medical care arrives.*

2. Your coworker has just returned from a two-week vacation in a cooler climate. She told you that she was worried about coming back to work in the heat, so she drank as much water as she could last night and again this morning. At break she drank some more water and didn't eat anything. She now seems a little sluggish and says she feels tired and maybe a little nauseous. You've been working outside in the heat for over four hours.

***Discussion:** Your coworker was correct about worrying about her heat tolerance after a vacation in a cooler climate, but her actions may have caused **hyponatremia**. She drank large quantities of water without eating and may have diluted her electrolytes. In addition, she is showing signs and symptoms of hyponatremia. Have her sit in the shade or go inside to a cool environment. If she's able to without throwing up, have her eat salty snacks, soup or bouillon. Unfortunately, the signs and symptoms of hyponatremia are similar to heat-related illnesses. If her condition doesn't improve or worsens, call 911.*

3. You've been outside almost all afternoon on a hot day installing a new irrigation system. You notice that you've developed a headache and are thirsty.

***Discussion:** You are probably **dehydrated**. You might also think back to how frequently you urinated that day and what color your urine was. Decreased urine output and dark yellow urine are signs of dehydration. Go rest in the shade or a cool indoor environment until you feel better. Drink water or a sports drink to help you rehydrate. If your condition doesn't improve, seek medical care.*

4. Three of you have been installing a new roof on a house on a hot day. You started early, but it is taking longer than you expected to finish the installation. It's now late afternoon and you aren't finished. You sent one of your coworkers to the truck for more supplies, but he hasn't come back yet. You go to look for him and find him sitting in the driveway in the sun. He's seems confused, has a very red face and is sweating profusely. When you ask him what happened, he doesn't really respond.

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Discussion: Your coworker is showing signs and symptoms of **heat stroke**. In the past we thought that if someone was sweating it was heat exhaustion and not heat stroke, but we now know that heat stroke victims can be sweating profusely. He has a red face, is confused and has an altered mental status (not responding), all signs and symptoms of heat stroke. This is a medical emergency. Call 911. Move him to the shade or a cool environment, and remove his outer clothing. Cool him as quickly as possible with cold water, an ice bath and/or cold compresses on his head, neck, armpits or groin. Circulate the air around him. Stay with him until medical care arrives.

5. You work in a foundry as a furnace operator. It's always really hot, but today the ventilation system isn't working well making it even hotter. Even the break room is hot. You see your coworker stumble a little and notice that he is sweating profusely. You ask him what's going on, and he tells you that he feels really hot and has a headache and is going to sit in the break room for a few minutes.

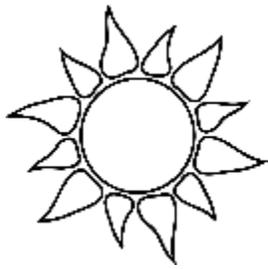
Discussion: Your coworker is showing signs and symptoms of **heat exhaustion**. Heat-related illnesses can occur indoors. You work in a hot environment, and today there is limited air movement because the ventilation system isn't working well. Resting in the break room probably won't help him much, since it is also a hot environment. If medical care isn't available at your work site, call 911. Remove your coworker from the hot area by going to a cool environment. Remove any unnecessary clothing including shoes and socks. Place cold compresses on his head, face and neck. Have him sip cool water or a cool sports drink. Stay with him until medical care arrives.

6. You and your coworker are installing pavers on a very hot day. All of a sudden, your coworker grabs her calf and says she just got a horrible cramp.

Discussion: Your coworker is probably having a **heat cramp**. Have her rest in a cool environment and drink water or better yet a sports drink. She can gently stretch the muscle. She should not return to strenuous physical activity until the cramp goes away. Remember that heat cramps can be a sign of heat exhaustion.

7. You have a new coworker who doesn't seem to be very physically fit. He also hasn't had much recent experience working outside on very hot and humid days. At the morning break he seemed a little irritable, so you were glad that you didn't have to work with him. Now it's late in the day, and all of a sudden you hear someone yell that the new coworker has just collapsed. You go over there, and see that he isn't responding to anyone and has a very red, dry face.

Discussion: Your coworker is showing signs and symptoms of **heat stroke**. He has a red, dry face, and isn't responding to anyone. His irritability at the morning break may have been a symptom of heat exhaustion. This is a medical emergency. Call 911. Move him to the shade or a cool environment, and remove his outer clothing. Cool him as quickly as possible with cold water, an ice bath and/or cold compresses on his head, neck, armpits or groin. Circulate the air around him. Stay with him until medical care arrives.



LOTERÍA

Learn about heat-related illnesses through a traditional game of chance, similar to bingo but using pictures instead of numbers.

Materials Supplied:

- 6 Loteria playing boards
- 27 Lotería playing cards

Materials Needed:

- Tokens such as coins – 9 per player

Preparation:

1. Print out the six playing boards and the three pages of playing cards.
2. For repeated use, print the playing boards and playing cards on card stock paper or have them laminated.
3. Each sheet of playing cards contains nine individual playing cards. Cut the sheets along the black lines, giving nine individual cards per sheet for a total of 27 individual playing cards.

Playing the Game:

1. You can play multiple versions of the game. Decide if you are going to play three across, four corners or coverall.
2. Give each player a playing board and tokens. You will need 9 tokens per player if you are playing coverall.
3. Shuffle the playing cards.
4. Read the description on the playing card, not the title. For example, the playing card for **Heat Stroke** has "Heat Stroke" in the white title box and the definition: "A medical emergency with a dramatic rise in body temperature" given below the title box.
5. Each player must identify the picture or phrase on their playing card that corresponds to the description and cover the space with the token.
6. If the player has the correct number of spaces covered (3, 4 or all 9 for coverall), they should call out Lotería.
7. Check to see if the player who called out Lotería correctly identified the pictures and phrases. If so, they are the winner.
8. You can continue the game for more winners or begin again.
9. If the player claims Lotería and they are incorrect, they are disqualified from that round.

Heat Exhaustion



Light-Colored Clothing



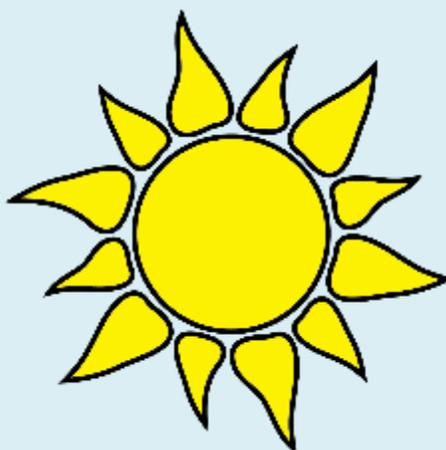
Call 911



Dark-Colored Clothing



Direct Sun



Wear a Hat



Fan



Sunscreen



Caffeine



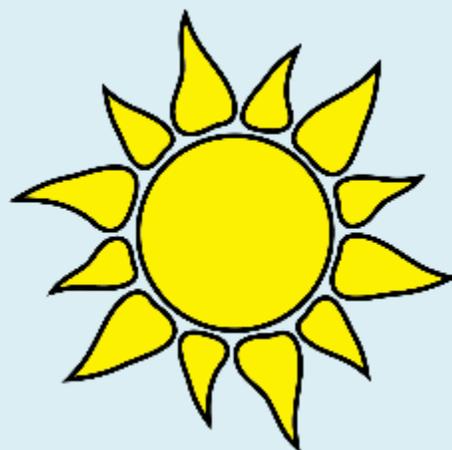
Light-Colored Clothing



Cold Compresses



Direct Sun



Take Frequent Breaks



Hyponatremia



Hard Hat with Sun Shade



Heat Stroke



Industrial Umbrella



Heat Cramps



Sunglasses



Call 911



Fan



Heat Exhaustion



Dark-Colored Clothing



Acclimatize



Heat Cramps



Hard Hat with Sun Shade



Salty Snacks



High Temperatures



Sunscreen



Heat Stroke



Drink Plenty of Fluids



Water Cooler



Cooling Band



Shade Structure



Salty Snacks



Sports Drinks



Ball Cap



Take Frequent Breaks



Wear a Hat



Sports Drinks



Cold Compresses



Drink Plenty of Fluids



Cooling Band



Water Cooler



Shade Structure



Sunglasses



Water Cooler



Cooling Safety Vest



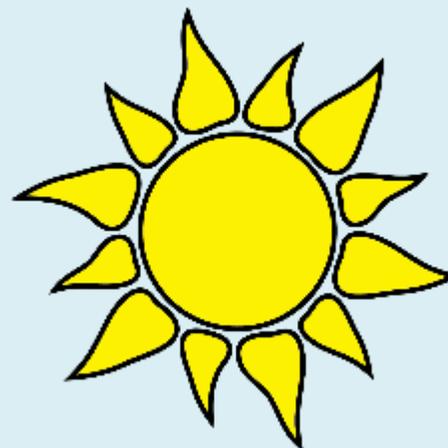
Wear a Hat



Shade Structure



Direct Sun



Industrial Umbrella



Heat Stroke



Sports Drinks



Acclimatize

Becoming more tolerant of heat by gradually increasing time worked in hot areas over a period of 7 to 14 days.



Ball Cap

These hats have a wide front brim but do not protect the neck and ears from the sun.



Caffeine

This substance is often found in coffee, teas and sodas and may increase your risk for dehydration when working in extreme heat.



Call 911

Heat stroke is a medical emergency and you should immediately call this number.



Cold Compresses

Workers suffering from heat stroke can be cooled with these placed on the head, neck, armpits and groin.



Cooling Band

Wet this and place it around your neck to help you stay cool.



Cooling Safety Vest

This type of vest uses evaporative cooling to keep you cool on the job.



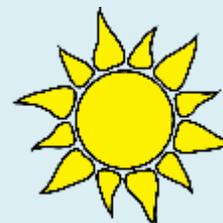
Dark-Colored Clothing

Working in this increases your risk of heat-related illnesses especially when it is tight-fitting.



Direct Sun

Working in this rather than in the shade increases your risk of heat-related illnesses.



Drink Plenty of Fluids

You should do this when working in heat to avoid dehydration.



Fan

This can be used to circulate air and help keep workers cool especially indoors.



Hard Hat with Sun Shade

Wear this when you need to protect their head from injury and are working in the direct sun.



Heat Cramps

Muscle cramps or spasms that can be caused by the loss of electrolytes from heavy sweating.



Heat Exhaustion

A heat-related illness which may include heavy sweating and pale, cool and clammy skin.



Heat Stroke

A medical emergency with a dramatic rise in body temperature that can be fatal.



High Temperatures

Working in these along with high humidity increases your risk of heat-related illnesses, especially if you are not acclimatized.



Hyponatremia

A heat-related illness caused by drinking too much water and losing too much salt through sweating.



Industrial Umbrella

This is a portable lightweight method of providing shade usually for one person.



Light-Colored Clothing

This is often the best type of clothing to wear when working in heat especially if it is loose-fitting and allows air movement.



Salty Snacks

Eat these to help replace the sodium lost from sweating.



Shade Structure

When no shade is available, this structure can provide shade for you and your coworkers.



Sports Drinks

Drink these when working in hot areas to help replace electrolytes lost from sweating.



Sunglasses

Wear these to protect your eyes from the sun's ultraviolet rays.



Sunscreen

Apply this regularly to avoid sunburn.



Take Frequent Breaks

When working in a hot area you should do this frequently preferably in the shade or a cool area.



Water Cooler

Having one of these at your worksite is a good way to provide cool water to employees.



Wear a Hat

Do this to keep direct sun off your head and help prevent heat-related illnesses.





CROSSWORD PUZZLE

Test your knowledge about heat-related illnesses with this crossword puzzle. Read the clues below and fill in the best answer.

Down:

1. This is a medical emergency that may result in death. Signs and symptoms may include confusion; loss of consciousness; hot, dry, red skin, seizures and a very high body temperature.
2. When you are taking a break outside, you should rest in this.
3. Our body's natural cooling mechanism.
4. Heat-related illnesses not only affect workers outdoors but can also affect workers in hot areas _____.
6. Some of these can lower your heat tolerance, both prescription and over-the-counter.
7. Signs and symptoms of this heat-related illness include heavy sweating; headache; nausea; dizziness; elevated body temperature; irritability; weakness and pale, cool, clammy skin.
10. When working in a hot environment, you should take _____ breaks.
12. Often occurs in skin that is persistently wet from sweating and looks like a red cluster of pimples or small blisters.
17. When working outdoors in the direct sun, you should wear one of these with a wide brim and a neck shade.
18. Especially indoors this will circulate air and cool workers.

Across:

5. You can become _____ while working in a hot environment when you lose more fluid from sweating than you are taking in.
8. The primary sign of this heat-related illness is fainting, usually for a short duration.
9. You may develop this heat-related illnesses when you drink large quantities of water and lose sodium from significant amounts of sweating.
11. Consumption of this type of beverage prior to or during work in a hot environment may lower your heat tolerance and increase your risk of a heat-related illness.
13. Often in heat stroke, the patient's face will be this color.
14. We need this liquid to keep us hydrated. It is vital for life.
15. Workers can build up their _____ to heat after daily heat exposure for 7 to 14 days.
16. Working in hot and _____ conditions increases your risk to heat-related illnesses.
19. You may have this heat-related illness when your muscles spasm or cramp when working in a hot environment. These can be a sign of heat exhaustion.
20. Workers should be trained on how to prevent, recognize and _____ heat-related illness.
21. When working outside in a hot environment, you should have a cup of cool water every 15 to 20 _____.



CROSSWORD PUZZLE

A crossword puzzle grid consisting of empty squares. The grid is filled with white squares, with some squares missing to form the puzzle's shape. There are 21 numbered starting points for words, each with a small number indicating the starting square. The numbers are: 1 (top center), 2 (top right), 3 (top right), 4 (middle left), 5 (middle left), 6 (middle right), 7 (middle center), 8 (middle center), 9 (middle left), 10 (bottom left), 11 (bottom center), 12 (bottom center), 13 (bottom left), 14 (bottom center), 15 (bottom right), 16 (bottom left), 17 (bottom center), 18 (bottom center), 19 (bottom center), 20 (bottom left), and 21 (bottom center).

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EXAM A

Choose the best answer for each multiple-choice question. There is only one best answer for each question.

Name: _____

Date: _____

1. Work practices that can reduce the risk of heat-related illnesses include:
 - a. Limiting the time workers spend in hot environments
 - b. Training workers to recognize the signs and symptoms of heat illnesses
 - c. Instituting a heat acclimatization plan
 - d. All of the above

2. The best description of adequate cool water is:
 - a. Water less than 59°F
 - b. Potable water less than 59°F provided in individual not communal drinking cups
 - c. Potable water less than 79°F provided in individual not communal drinking cups
 - d. Individual store-bought water bottles

3. Workers that will be working in the heat for over 2 hours should be encouraged to drink:
 - a. A cup of cool water every two hours
 - c. Two cups of cool water every hour
 - d. A cup of cool water every 15 to 20 minutes
 - e. Coffee at every break

4. During prolonged sweating lasting several hours workers should:
 - a. Double the amount of water they have been drinking
 - b. Take salt tablets at every break
 - c. Drink a sports drink that contains electrolytes
 - d. Drink a carbonated diet soda

5. Signs and symptoms of heat exhaustion include:
 - a. Sleepiness and hot dry skin
 - b. Unequal pupils
 - c. Headache, dizziness, irritability, heavy sweating, and nausea
 - d. Excessive urination

6. Risk factors for hyponatremia include:
 - a. Exercising for an hour in extreme heat
 - b. Exercising for greater than 4 hours, drinking excessive quantities of water, over hydrating before exercise and extreme heat
 - c. Drinking water in extreme heat
 - d. Drinking sports drinks and eating salty snacks

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7. All of these are risk factors for heat-related illnesses except:
 - a. Direct sun exposure
 - b. High temperatures
 - c. Working under a shade structure
 - d. Limited air movement

8. A heat acclimatization plan should include:
 - a. Plans for providing adequate cool water to workers
 - b. A work and rest schedule
 - c. Plans for providing a cool area for workers to rest and recover
 - d. All of the above

9. Dehydration occurs when:
 - a. Someone does not eat enough the night before physical activity in high temperatures
 - b. The water lost from sweating is not completely replaced
 - c. Workers drink sports drinks rather than water
 - d. Workers are working outside during the summer

10. Workers may be more susceptible to heat-related illness if they:
 - a. Drink sports drinks while working in the heat
 - b. Have recently drunk alcohol
 - c. Acclimatize to the heat over 7 to 10 days
 - d. Increase air movement in their work area

11. Heat acclimatization or heat tolerance can be regained after a week-long vacation:
 - a. By drinking extra fluids the first day returning to work
 - b. In 7 to 10 days upon returning to a hot job
 - c. In 2 to 3 days upon returning to a hot job
 - d. By working extra hard the first few days back

12. Signs and symptoms of heat stroke include:
 - a. Muscle cramps in the arms or legs
 - b. Confusion, hot dry skin (but sometimes heavy sweating), flushed face, very high body temperature, seizures and unconsciousness
 - c. Headache, dizziness, irritability, heavy sweating and nausea
 - d. Excessive urination

13. The heat-related illness that is always a medical emergency and requires a 911 call is:
 - a. Heat cramps
 - b. Hyponatremia
 - c. Heat stroke
 - d. Heat exhaustion

14. Signs and symptoms of hyponatremia include:
 - a. Muscle cramps in the arms or legs
 - b. Confusion, hot dry skin (but sometimes heavy sweating), flushed face, very high body temperature, seizures and unconsciousness
 - c. Headache, dizziness, irritability, heavy sweating and nausea
 - d. Nausea, vomiting, confusion, frequent urination and may appear intoxicated

15. First aid for heat stroke includes:
 - a. Calling 911
 - b. Moving the worker to shade
 - c. Cooling the worker quickly
 - d. All of the above

16. Early signs and symptoms of heat intolerance include:
 - a. Seizures
 - b. Loss of consciousness
 - c. Hunger
 - d. Weakness, unsteady gait, irritability, disorientation, changes in skin color or general malaise

17. First aid for hyponatremia includes:
 - a. Drinking sports drinks and eating salty snacks
 - b. Taking salt tablets
 - c. Drinking large quantities of water
 - d. Taking a nap

18. Personal protective equipment (PPE) can increase a worker's risk for heat illnesses when it:
 - a. Limits air movement and the cooling effects of sweating
 - b. Is very expensive to buy
 - c. Has a cooling system
 - d. Reflects heat

19. When possible workers should wear the following to reduce their risk for heat illnesses:
 - a. Chemical hazard suit
 - b. Multiple layers of insulating clothing
 - c. Dark colored or tight-fitting clothing
 - d. A sun hat and lightweight, light-colored and loose-fitting clothing

20. First aid for heat exhaustion does not include:
 - a. Having the worker sip cool water or an electrolyte drink
 - b. Removing the worker from hot area
 - c. Giving salt tablets
 - d. Cooling the worker with cold compresses



EXAM A - ANSWER KEY

1. Work practices that can reduce the risk of heat-related illnesses include:
 - a. Limiting the time workers spend in hot environments
 - b. Training workers to recognize the signs and symptoms of heat illnesses
 - c. Instituting a heat acclimatization plan
 - d. **All of the above**

2. The best description of adequate cool water is:
 - a. Water less than 59°F
 - b. **Potable water less than 59°F provided in individual not communal drinking cups**
 - c. Potable water less than 79°F provided in individual not communal drinking cups
 - d. Individual store-bought water bottles

3. Workers that will be working in the heat for over 2 hours should be encouraged to drink:
 - a. A cup of cool water every two hours
 - c. Two cups of cool water every hour
 - d. **A cup of cool water every 15 to 20 minutes**
 - e. Coffee at every break

4. During prolonged sweating lasting several hours workers should:
 - a. Double the amount of water they have been drinking
 - b. Take salt tablets at every break
 - c. **Drink a sports drink that contains electrolytes**
 - d. Drink a carbonated diet soda

5. Signs and symptoms of heat exhaustion include:
 - a. Sleepiness and hot dry skin
 - b. Unequal pupils
 - c. **Headache, dizziness, irritability, heavy sweating, and nausea**
 - d. Excessive urination

6. Risk factors for hyponatremia include:
 - a. Exercising for an hour in extreme heat
 - b. **Exercising for greater than 4 hours, drinking excessive quantities of water, over hydrating before exercise and extreme heat**
 - c. Drinking water in extreme heat
 - d. Drinking sports drinks and eating salty snacks

7. All of these are risk factors for heat-related illnesses except:
- a. Direct sun exposure
 - b. High temperatures
 - c. **Working under a shade structure**
 - d. Limited air movement
8. A heat acclimatization plan should include:
- a. Plans for providing adequate cool water to workers
 - b. A work and rest schedule
 - c. Plans for providing a cool area for workers to rest and recover
 - d. **All of the above**
9. Dehydration occurs when:
- a. Someone does not eat enough the night before physical activity in high temperatures
 - b. **The water lost from sweating is not completely replaced**
 - c. Workers drink sports drinks rather than water
 - d. Workers are working outside during the summer
10. Workers may be more susceptible to heat-related illness if they:
- a. Drink sports drinks while working in the heat
 - b. **Have recently drunk alcohol**
 - c. Acclimatize to the heat over 7 to 10 days
 - d. Increase air movement in their work area
11. Heat acclimatization or heat tolerance can be regained after a week-long vacation:
- a. By drinking extra fluids the first day returning to work
 - b. In 7 to 10 days upon returning to a hot job
 - c. **In 2 to 3 days upon returning to a hot job**
 - d. By working extra hard the first few days back
12. Signs and symptoms of heat stroke include:
- a. Muscle cramps in the arms or legs
 - b. **Confusion, hot dry skin (but sometimes heavy sweating), flushed face, very high body temperature, seizures and unconsciousness**
 - c. Headache, dizziness, irritability, heavy sweating and nausea
 - d. Excessive urination
13. The heat-related illness that is always a medical emergency and requires a 911 call is:
- a. Heat cramps
 - b. Hyponatremia
 - c. **Heat stroke**
 - d. Heat exhaustion

14. Signs and symptoms of hyponatremia include:
- Muscle cramps in the arms or legs
 - Confusion, hot dry skin (but sometimes heavy sweating), flushed face, very high body temperature, seizures and unconsciousness
 - Headache, dizziness, irritability, heavy sweating and nausea
 - Nausea, vomiting, confusion, frequent urination and may appear intoxicated**
15. First aid for heat stroke includes:
- Calling 911
 - Moving the worker to shade
 - Cooling the worker quickly
 - All of the above**
16. Early signs and symptoms of heat intolerance include:
- Seizures or loss of consciousness
 - Weakness, headache and nausea**
 - Hunger, flushed skin and excessive sweating
 - Slurred speech
17. First aid for hyponatremia includes:
- Drinking sports drinks and eating salty snacks**
 - Taking salt tablets
 - Drinking large quantities of water
 - Taking a nap
18. Personal protective equipment (PPE) can increase a worker's risk for heat illnesses when it:
- Limits air movement and the cooling effects of sweating**
 - Is very expensive to buy
 - Has a cooling system
 - Reflects heat
19. When possible workers should wear the following to reduce their risk for heat illnesses:
- Chemical hazard suit
 - Multiple layers of insulating clothing
 - Dark colored or tight-fitting clothing
 - A sun hat and lightweight, light-colored and loose-fitting clothing**
20. First aid for heat exhaustion does not include:
- Having the worker sip cool water or an electrolyte drink
 - Removing the worker from hot area
 - Giving salt tablets**
 - Cooling the worker with cold compresses



EXAM B

Choose the best answer for each multiple-choice question. There is only one best answer for each question.

Name: _____

Date: _____

1. Heat-related illnesses are:
 - a. Not preventable
 - b. Serious medical conditions that can occur from working in hot conditions
 - c. Only occur when working outdoors
 - d. Take 3 to 4 days to develop after working outdoors

2. To help prevent heat-related illnesses when working outdoors in hot conditions:
 - a. Drink large quantities of water the night before to pre-hydrate
 - b. Wear a hat and dark, tight fitting clothing
 - c. Take frequent breaks in the shade, drink cool water or sports drinks, eat salty snacks, wear a sun hat and light color loose fitting clothing, and work during cooler parts of the day
 - d. Take breaks only when you feel too hot

3. To help acclimatize to the heat:
 - a. Gradually increase the time you work in hot conditions
 - c. Work extra hard the first hot day
 - d. Keep working even if you feel sick
 - e. Drink coffee at every break

4. When working in heat for longer than two hours, you should drink:
 - a. A cup of water (8 ounces) every hour
 - c. At least a gallon of water every two hours
 - d. A cup of water (8 ounces) every 15 to 20 minutes
 - e. Some water at every break

5. When you've been working in the heat and sweating for several hours you should:
 - a. Double the amount of water you've been drinking at every break
 - b. Take salt tablets at every break
 - c. Drink sports drinks that contain electrolytes and eat salty snacks
 - d. Drink a carbonated diet soda

6. Factors that may make you more at risk for heat-related illnesses include:
 - a. Over the age of 60
 - b. Obesity and/or lack of physical fitness
 - c. Certain medications, alcohol or caffeine
 - d. All of the above

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7. Signs and symptoms of heat syncope include:
- Confusion, altered mental status, slurred speech, loss of consciousness, hot, dry skin (sometimes profuse sweating), seizures and very high body temperature
 - Nausea, vomiting, confusion, frequent urination and may appear intoxicated
 - Headache, dizziness, irritability, heavy sweating, thirst, decreased urine output, elevated body temperature and nausea
 - Fainting for a short duration, dizziness, and lightheadedness
8. Signs and symptoms of heat exhaustion include:
- Confusion; altered mental status; slurred speech; loss of consciousness; hot, dry skin (sometimes profuse sweating); seizures and very high body temperature
 - Nausea, vomiting, confusion, frequent urination and may appear intoxicated
 - Headache; dizziness; irritability; heavy sweating; decreased urine output; elevated body temperature and nausea; and pale, cool, clammy skin
 - Fainting for a short duration, dizziness, lightheadedness
9. Signs and symptoms of heat stroke include:
- Confusion; altered mental status; slurred speech; loss of consciousness; hot, dry skin (sometimes profuse sweating); seizures and very high body temperature
 - Nausea, vomiting, confusion, frequent urination and may appear intoxicated
 - Headache; dizziness; irritability; heavy sweating; decreased urine output; elevated body temperature and nausea; and pale, cool, clammy skin
 - Fainting for a short duration, dizziness, lightheadedness
10. You may be at risk for hyponatremia if you have been:
- Exercising for an hour in extreme heat
 - Exercising for greater than 4 hours, drinking excessive quantities of water, over hydrating before exercising and working in extreme heat
 - Drinking a cup of water or a sports drink every 15 to 20 minutes and eating salty snacks
 - Drinking sports drinks and eating salty snacks
11. Environmental factors that increase your risk for heat-related illnesses include:
- Direct sun exposure
 - High temperatures and high humidity
 - Limited air movement
 - All of the above
12. The best description of first aid for heat exhaustion is:
- Removing the worker from the hot area, loosening tight clothing, having the worker sip cool water or an electrolyte drink and cooling the worker with cool compresses
 - Removing the worker from the hot area, loosening tight clothing having the worker sip cool water, giving salt tablets and cooling the worker with cool compresses
 - Removing the worker from the hot area and cooling the worker with cool compresses
 - Loosening tight clothing and having the worker sip cool water or an electrolyte drink

13. The best description of first aid for heat stroke is:
- Remove the worker from the hot area, loosen tight clothing, have the worker sip cool water or an electrolyte drink and cool the worker with cool compresses
 - Call 911, remove the worker from the hot area, loosen tight clothing, have the worker sip cool water, give salt tablets and cool the worker with cool compresses
 - Call 911, move the worker to a cool area and remove outer clothing, cool the worker quickly with cold water or an ice bath, circulate the air around the worker, place cold compresses on the head, neck, armpits and groin.
 - Loosening tight clothing, having the worker sip cool water or an electrolyte drink and cooling the worker with cool compresses
14. When you return to work after a week-long vacation:
- You are still acclimatized to heat as you were prior to your vacation
 - You will regain your heat acclimatization in 2 to 3 days
 - You should drink extra fluids the first day you return to work to regain your heat acclimatization
 - You will regain your heat acclimatization in 2 to 3 weeks
15. Which one of these is not a risk factor for heat-related illnesses for indoor workers:
- Heat sources such as ovens and furnaces
 - Proper functioning air conditioning and ventilation
 - High outdoor temperatures and humidity
 - Lack of air movement or insufficient ventilation
16. Your coworker is having a heat cramp in his leg. Your best recommendation is:
- Taking salt tablets
 - Resting, drinking a sports drink and having a salty snack
 - Stretching and applying ice packs
 - Resting and having a salty snack
17. To help prevent heat-related illnesses when working in hot conditions you should wear:
- Multiple layers of clothing
 - A sun hat, sunscreen and lightweight, dark-colored and loose-fitting clothing
 - Impermeable clothing that limits the movement of air and water vapor
 - A sun hat, sunscreen and lightweight, light-colored and loose-fitting clothing
18. The heat-related illness that is always a medical emergency and requires a 911 call is:
- Heat cramps
 - Hyponatremia
 - Heat stroke
 - Heat exhaustion



EXAM B – ANSWER KEY

1. Heat-related illnesses are:
 - a. Not preventable
 - b. Serious medical conditions that can occur from working in hot conditions**
 - c. Only occur when working outdoors
 - d. Take 3 to 4 days to develop after working outdoors

2. To help prevent heat-related illnesses when working outdoors in hot conditions:
 - a. Drink large quantities of water the night before to pre-hydrate
 - b. Wear a hat and dark, tight fitting clothing
 - c. Take frequent breaks in the shade, drink cool water or sports drinks, eat salty snacks, wear a sun hat and light color loose fitting clothing, and work during cooler parts of the day**
 - d. Take breaks only when you feel too hot

3. To help acclimatize to the heat:
 - a. Gradually increase the time you work in hot conditions**
 - c. Work extra hard the first hot day
 - d. Keep working even if you feel sick
 - e. Drink coffee or at every break

4. When working in heat for longer than two hours, you should drink:
 - a. A cup of water (8 ounces) every hour
 - c. At least a gallon of water every two hours
 - d. A cup of water (8 ounces) every 15 to 20 minutes**
 - e. Some water at every break

5. When you've been working in the heat and sweating for several hours you should:
 - a. Double the amount of water you've been drinking at every break
 - b. Take salt tablets at every break
 - c. Drink sports drinks that contain electrolytes and eat salty snacks**
 - d. Drink a carbonated diet soda

6. Factors that may make you more at risk for heat-related illnesses include:
 - a. Over the age of 60
 - b. Obesity and/or lack of physical fitness
 - c. Certain medications, alcohol or caffeine
 - d. All of the above**

7. Signs and symptoms of heat syncope include:
- Confusion, altered mental status, slurred speech, loss of consciousness, hot, dry skin (sometimes profuse sweating), seizures and very high body temperature
 - Nausea, vomiting, confusion, frequent urination and may appear intoxicated
 - Headache, dizziness, irritability, heavy sweating, thirst, decreased urine output, elevated body temperature and nausea
 - Fainting for a short duration, dizziness, and lighted-headedness**
8. Signs and symptoms of heat exhaustion include:
- Confusion, altered mental status, slurred speech, loss of consciousness, hot, dry skin (sometimes profuse sweating), seizures and very high body temperature
 - Nausea, vomiting, confusion, frequent urination and may appear intoxicated
 - Headache; dizziness; irritability; heavy sweating; decreased urine output; elevated body temperature; nausea; and pale, cool, clammy skin**
 - Fainting for a short duration, dizziness and lighted-headedness
9. Signs and symptoms of heat stroke include:
- Confusion; altered mental status; slurred speech; loss of consciousness; hot, red, dry skin (sometimes profuse sweating); seizures; and very high body temperature**
 - Nausea, vomiting, confusion, frequent urination and may appear intoxicated
 - Headache, dizziness, irritability, heavy sweating, thirst, decreased urine output, elevated body temperature and nausea
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 - Drinking a cup of water or a sports drink every 15 to 20 minutes and eating salty snacks
 - Drinking sports drinks and eating salty snacks
11. Environmental factors that increase your risk for heat-related illnesses include:
- Direct sun exposure
 - High temperatures and high humidity
 - Limited air movement
 - All of the above**
12. The best description of first aid for heat exhaustion is:
- Removing the worker from the hot area, loosening tight clothing, having the worker sip cool water or an electrolyte drink and cooling the worker with cool compresses**
 - Removing the worker from the hot area, loosening tight clothing having the worker sip cool water, giving salt tablets and cooling the worker with cool compresses
 - Removing the worker from the hot area and cooling the worker with cool compresses
 - Loosening tight clothing and having the worker sip cool water or an electrolyte drink

13. The best description of first aid for heat stroke is:
- Removing the worker from the hot area, loosening tight clothing, having the worker sip cool water or an electrolyte drink and cooling the worker with cool compresses
 - Calling 911, removing the worker from the hot area, loosening tight clothing, having the worker sip cool water, giving salt tablets and cooling the worker with cool compresses
 - Calling 911, moving the worker to a cool area and removing outer clothing, cooling the worker quickly with cold water or an ice bath, circulating the air around the worker, placing cold compresses on the head, neck, armpits and groin.**
 - Loosening tight clothing, having the worker sip cool water or an electrolyte drink and cooling the worker with cool compresses
14. When you return to work after a week-long vacation:
- You are still acclimatized to heat as you were prior to your vacation
 - You will regain your heat acclimatization in 2 to 3 days**
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 - Resting and having a salty snack
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 - A sun hat, sunscreen and lightweight, dark-colored and loose-fitting clothing
 - Impermeable clothing that limits the movement of air and water vapor
 - A sun hat, sunscreen and lightweight, light-colored and loose-fitting clothing**
18. The heat-related illness that is always a medical emergency and requires a 911 call is:
- Heat cramps
 - Hyponatremia
 - Heat stroke**
 - Heat exhaustion

Please indicate your level of agreement with the following statement by circling the appropriate number. 1 means strongly disagree and 5 means strongly agree.

INSTRUCTOR, MATERIALS AND FORMAT

| | Strongly Disagree | | | Strongly Agree | |
|---|--------------------------|---|---|-----------------------|---|
| 1. The instructor was well prepared. | 1 | 2 | 3 | 4 | 5 |
| 2. The instructor was knowledgeable about the topic. | 1 | 2 | 3 | 4 | 5 |
| 3. The course was well organized and easy to follow. | 1 | 2 | 3 | 4 | 5 |
| 4. The course location was comfortable. | 1 | 2 | 3 | 4 | 5 |
| 5. The course location was appropriate for the course format. | 1 | 2 | 3 | 4 | 5 |
| 6. The presentation materials were well-designed. | 1 | 2 | 3 | 4 | 5 |
| 7. The presentation materials helped explain the topic. | 1 | 2 | 3 | 4 | 5 |
| 8. The length of the course was appropriate. | 1 | 2 | 3 | 4 | 5 |
| 9. The course was too detailed. | 1 | 2 | 3 | 4 | 5 |
| 10. The handouts will be useful to me (Skip if no handouts). | 1 | 2 | 3 | 4 | 5 |

YOUR LEARNING

| | Strongly Disagree | | | Strongly Agree | |
|---|--------------------------|---|---|-----------------------|---|
| 1. I learned skills or knowledge that I can apply at work. | 1 | 2 | 3 | 4 | 5 |
| 2. The ideas were expressed clearly. | 1 | 2 | 3 | 4 | 5 |
| 3. I had the opportunity to ask questions. | 1 | 2 | 3 | 4 | 5 |
| 4. The material was too difficult for me to fully understand. | 1 | 2 | 3 | 4 | 5 |
| 5. I knew all of this already. | 1 | 2 | 3 | 4 | 5 |
| 6. The instructor presented examples that are useful to me. | 1 | 2 | 3 | 4 | 5 |
| 7. Taking this course will help me at work. | 1 | 2 | 3 | 4 | 5 |
| 8. I was comfortable participating in this course. | 1 | 2 | 3 | 4 | 5 |
| 9. I'd like to learn more about this topic. | 1 | 2 | 3 | 4 | 5 |
| 10. I think that the course met its goal. | 1 | 2 | 3 | 4 | 5 |



HEAT-RELATED ILLNESSES

WHAT TO LOOK FOR

WHAT TO DO

HEAT STROKE

- Hot, dry, red skin
- Very high body temperature
- Altered mental status
- Loss of consciousness

- Call 911 immediately – a medical emergency
- Cool the person down any way you can

HEAT EXHAUSTION

- Excessive sweating
- Pale, cool, clammy skin
- Headache, nausea, dizziness
- Thirsty, irritable

- Give cool drinks
- Cool the person down
- Rest and loosen tight clothing
- Seek medical assistance

HEAT CRAMPS

- Muscle cramps or spasms
- Often in legs, arms or abdomen

- Cool the person down
- Give salty snacks and electrolyte replacement drinks
- Rest in shade

HYPONATREMIA

- Lethargy, fatigue, drowsiness
- Headache, nausea, vomiting
- Frequent urination
- Overhydration

- Give salty snacks and electrolyte replacement drinks
- Rest in shade
- Cool the person down

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HEAT-RELATED ILLNESSES

Heat Stroke

Heat Exhaustion

Hot, red, dry skin

Pale, cool, clammy skin

Altered mental status

Irritable

Usually no sweating

Excessive sweating

Headache, nausea or vomiting

Headache, nausea or vomiting

Loss of consciousness

Dizziness

CALL 911 IMMEDIATELY!

Cool down person. Move to shaded area. Give cool drinks. Call for medical assistance.

COOL DOWN PERSON ANY WAY YOU CAN.



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