FOCUS ON Hazardous substances causing dermatitis

Focus on learning key	
Exercise Analyse the information in your work group	**Discuss** Go through questions in your workgroup

Date:	
Shift:	
Discussion led by:	

Attendees names:	

Introduction

Occupational Contact Dermatitis (OCD) is a skin condition that can be caused by exposure to many substances.

Irritant Contact Dermatitis (ICD) is responsible for over $^{2}/_{3}$ of OCD and can occur when in contact with strong irritants such as strong acids and alkalis and mild irritants such as soaps and detergents. Contact with the substance can cause irritation or inflammation of the skin. This may occur immediately with contact with a strong irritant or may occur with prolonged or repeated exposure to a mild irritant.

Allergic Contact Dermatitis (ACD) is a 'hypersensitivity' reaction to a substance. This reaction is delayed, usually occurring 8 to 14 days after contact, however allergic dermatitis does not always develop in an individual. If a reaction does occur, it may appear weeks to months or even years from contact.

Symptoms for both types of contact dermatitis cause inflammation, redness, scaling, blisters and cracking of the skin.

Unlike ICD where it is confined to the area of the skin that has come into contact with the irritating substance, ACD may appear anywhere over the body.

If ICD is already present, this can increase the likelihood of ACD[1].

This resource will aid further analysis of exposure to hazardous substances in your workplace to better prevent the occurrence of occupational dermatitis using the risk management approach[2]

- Identify
- Assess
- Control
- Evaluate

1

The development of symptoms of dermatitis indicates that controls may not be effective in managing the chemical hazard. Irritant contact dermatitis tends to be a one off event where recovery is rapid however repeated exposure can worsen to an allergic contact dermatitis. This results in a negative health effect every time you come into contact with the particular substance.

[1] Australian Safety and Compensation Council (2006) Occupational Dermatitis in Australia.
[2] Standards Australia (2001) AS4801Occupational Health and Safety Management Systems.

Dermatitis

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Symptoms	
Irritant Contact Dermatitis	**Allergic Contact Dermatitis**
• Mild swelling of the skin • Stiff, tight feeling in the skin • Dry cracking of the skin • Blisters • Localised reaction (area where contact was made).	• Reddening of skin • Dry scaly patches • Blisters that ooze • Burning or itching • Swelling in the eyes • Hives • Darkened / cracked skin • Reaction can spread beyond the area where contact was made

Australian Safety and Compensation Council (2006) Occupational Dermatitis in Australia

A

What hazardous substances are you exposed to throughout the course of your duties? List as many of them as possible in the table below:

List here the hazardous substance that you use the most:	

2

Are these substances above listed on your hazardous substance register?

☐ Yes ☐ No

Is there a procedure for the hazardous substance that you use?

☐ Yes ☐ No

Have you been trained in the use of substance?

☐ Yes ☐ No

Is the container that these hazardous substances are stored in clearly labelled with the name?

☐ Yes ☐ No

Do you have access to a Material Safety Data Sheet (MSDS) for this hazardous substance?

☐ Yes ☐ No

3

Assessing Risk

When we assess the risk of exposure to hazardous substances, like safety issues, we still consider the possible consequences of exposure and the likelihood of exposure.

Consequence

To determine the consequence we need to consider what can happen.

Likelihood

To determine the likelihood we need to determine the chances of a negative health effect occurring.

Standards Australia (2001) AS4801Occupational Health and Safety Management Systems

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The following describes the type of effects that exposure to hazardous substances can have. Understanding these effects will assist in determining possible consequence to exposure to the substance.

Acute effects	Acute health effects usually appear within hours of exposure.
Chronic effects	Usually appears after repeated exposure over days, weeks and months.
Latency	The period of time it takes before the development of symptoms occur.

Australian Institute of Occupational Hygienists (2007) Principles of occupational health and hygiene, C.Tillman, Allen & Unwin, Australia

B

What is the potential consequence from the hazardous substances exposure you identified in exercise B?

- ☐ A - Severe permanent health effects.
- ☐ B - Mild permanent health effects
- ☐ C - Temporary health effects
- ☐ D - Minor health effects
- ☐ E - No effect

The following table rates the severity of the consequence.

Example: Glen works in the mechanical workshop and regularly uses toluene based solvent to degrease parts on mining plant. Burning sensation, redness, swelling and/or blisters have been identified as possible symptoms due to exposure to the skin. These symptoms can be reversed with treatment however the likelihood of reoccurrence increases. Glen assessed the potential negative health effects to be C “Temporary Health Effects”. This carried a severity rating that is orange.

Consequences Key		Severity Rating Description	
A	**Severe permanent health effects.**	Red	Symptoms are chronic and will require ongoing management or treatment and not fully reversible
B	**Mild permanent health effects**		Symptoms require lengthy treatment but eventually will resolve.
C	**Temporary health effects**	Orange	Effects are likely to resolve over time.
D	**Minor health effects.**		Short term impacts that are fully reversible.
E	**No effect**	Green	Exposure level not likely to cause effect

International Council of Mining and Metals (2009) Good practice guidance occupational health risk assessment, UK.

Dermatitis

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Likelihood

To determine likelihood we consider the amount of atmospheric contaminant we are exposed to + the amount of time we are exposed + and how often we are exposed.

Intensity + Exposure Time + Frequency of Exposure = Likelihood.

Australian Institute of Occupational Hygienists (2007) Principles of occupational health and hygiene, C.Tillman, Allen & Unwin, Australia

C

Intensity

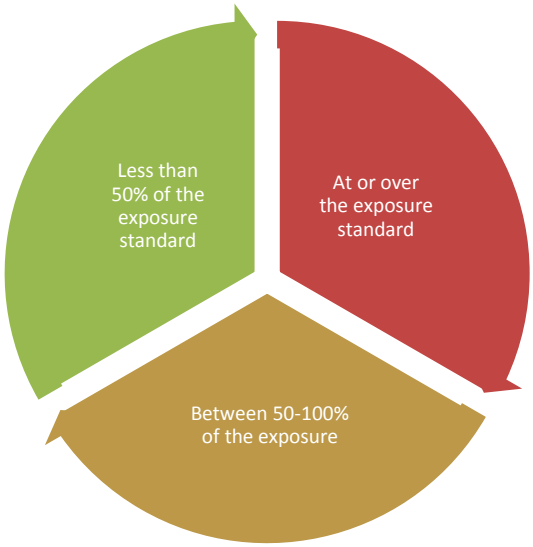
To determine intensity of a hazardous substance exposure you will need access to the most recent Material Safety Data Sheet. Intensity or concentration is expressed in Parts Per Million (ppm). Assess the intensity for the chemical that you identified in exercise A and record results in the Hazardous Substance Intensity Table.

Example: Glen our maintenance man has obtained the material safety data sheet for the chemical Toluene and has recorded the concentration in the intensity table and then compared this against the exposure standard. Glen then rated the exposure intensity using the chart below and recorded the results of the assessment.

Australian Institute of Occupational Hygienists (2007) Principles of occupational health and hygiene, C.Tillman, Allen & Unwin, Australia

Example - Hazardous Substance Intensity Assessment Table

Hazardous Substance	Toluene	Exposure Standard	50 ppm	TWA	
			150 ppm	STEL	
Look to material safety data sheet or the label on the container to determine the concentration of the chemical you have identified in exercise A as the chemical that you use most. Write the concentration in the next field		50 ppm		Risk Rating Red, Orange or Green	
				TWA	STEL
				Orange	Green



International Council of Mining and Metals (2009) Good practice guidance occupational health risk assessment, UK.

Hazardous Substance Intensity Assessment Table					
Hazardous Substance		Exposure Standard	ppm	TWA	
			ppm	STEL	
Look to material safety data sheet or the label on the container to determine the concentration of the chemical you have identified in exercise A as the chemical that you use most. Write the concentration in the next field		ppm		Risk Rating Red, Orange or Green	
				TWA	STEL

International Council of Mining and Metals (2009) Good practice guidance occupational health risk assessment, UK.

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Time Weighted Average (TWA)

Time weighted average is an exposure limit that has been established based on the average tolerance of exposure of the hazardous substance within an 8 hour period, 5 days a week.

Australian Institute of Occupational Hygienists (2007) Principles of occupational health and hygiene, C.Tillman, Allen & Unwin, Australia

D

Exposure Time

The longer you are exposed to a hazardous substance the greater the likelihood of a negative health effect occurring.

Determine how long you are exposed to the hazardous substance identified in exercise A and answer the following question.

Example: Glen would use the hazardous substance "toluene" to degrease mining plant for no more than 15 mins so he would answer "No".

Are you exposed to your chemical for more than 8 hours per day?

No	Yes

Australian Institute of Occupational Hygienists (2007) Principles of occupational health and hygiene, C.Tillman, Allen & Unwin, Australia

Dermatitis

Frequency

The more you work with a hazardous substance the greater the likelihood of a negative health effect occurring.

Determine how often you are exposed to the hazardous substance identified in exercise A and answer the question below.

Example: Glen works 5 days a week and uses the hazardous substance every day. Glen would answer "yes" to the questions below.

Are you exposed to you hazardous substance more than 5 days a week?

No	Yes

Australian Institute of Occupational Hygienists (2007) Principles of occupational health and hygiene, C.Tillman, Allen & Unwin, Australia

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Short Term Exposure Limits (STEL)

STEL are limits that have been established for chemicals where higher exposures can be tolerated in small periods. The criteria for STEL is the exposure should not be more than 15 minutes, nor should the frequency of exposure exceed more than 4 times a day with a minimum of 60 minutes break between exposures.

This exercise should only be conducted if a STEL has been established for your identified hazardous substance. It would not be appropriate to assess a STEL for a hazardous substance that does not have an established STEL.

Australian Institute of Occupational Hygienists (2007) Principles of occupational health and hygiene, C.Tillman, Allen & Unwin, Australia

E

Does your hazardous substance have a STEL?

No	Yes

If you answered no, you can skip the next exercise.

Exposure Length

The following assessments look to identify if and when you may be exceeding your STEL.

Australian Institute of Occupational Hygienists (2007) Principles of occupational health and hygiene, C.Tillman, Allen & Unwin, Australia

Short Term Exposure Limit

Assessment 1 assumes that the time on a task is 15 minutes or less. The assessment analyses how often you conduct the task and the length of break between exposures.

Analyse your short term exposure and tick the relevant box.

Example: Glen uses toluene once a day so he would tick "Less" in the "4 time a Day" field. This also means that he ticks "more" in the "60 mins Between Successive Exposure" field.

Short Term Exposure Limit Assessment 1						
Exposure Length Assessment	4 Times a Day			60 Mins Between Successive Exposure		
15 Mins	Less	Equal	More	Less	Equal	More

Australian Institute of Occupational Hygienists (2007) Principles of occupational health and hygiene, C.Tillman, Allen & Unwin, Australia

F

Frequency

Short Term Exposure Limit Assessment 2 assumes that frequency is 4 times a day or less and analyses the amount of time you spend on task and the length of break you get between exposures.

Example: Glen uses toluene for approximately 15 minutes so he would tick "Equal" in the "15 Mins" field. He only does it once throughout the day so he would tick "More" in the "60 Mins Between Successive Exposures" field.

Short Term Exposure Limit Assessment 2						
Frequency	15 Mins			60 Mins Between Successive Exposure		
4 Times a Day	Less	Equal	More	Less	Equal	More

Australian Institute of Occupational Hygienists (2007) Principles of occupational health and hygiene, C.Tillman, Allen & Unwin, Australia

G

Break Length Between Exposure

Short Term Exposure Limit Assessment 3 assumes that the break between successive exposures is 60 minutes or more and analyses the frequency and length of time spent on the task.

Example: Glen only conducts the task once throughout the day so he would tick "less" in the "4 Times a Day" field but he works around 15 minutes on the task so Glen would tick "Equal" in the "15 Mins" field.

Short Term Exposure Limit Assessment 3						
Break Length Between Exposure Assessment	4 Times a Day			15 Mins		
60 Mins Between Successive Exposure	Less	Equal	More	Less	Equal	More

Australian Institute of Occupational Hygienists (2007) Principles of occupational health and hygiene, C.Tillman, Allen & Unwin, Australia

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H

Prioritising Risk Management

Determining what factor increases the likelihood of a negative health consequence. Record your assessment results for consequence and likelihood in the following table and determine your risk. Control advice is provided according to the risk rating.

Consequence	Likelihood							No of red Risk Ratings
	Intensity		STEL			TWA		
	TWA	STEL	Length	Frequency	Break	Length	Frequency	
Orange	Orange	Green	Green Green	Orange Green	Green Orange	Green	Red	1
Red Rating	Immediate Intervention		Immediate action is required to reduce exposure. Decide whether your exposure risk is from intensity, frequency or length and implement controls.					
Orange Ratings	Reinforce Control Measures		Evaluate current controls and determine what further controls are needed.					
Green Ratings	Monitor Existing Controls and Exposure		Continue to monitor the effectiveness of controls and take appropriate action when needed.					

International Council of Mining and Metals (2009) Good practice guidance occupational health risk assessment, UK.

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Consequence	Likelihood							No of red Risk Ratings
	Intensity		STEL			TWA		
	Recent	Average	Length	Frequency	Break	Length	Frequency	
Red Ratings	Immediate Intervention		Immediate action is required to reduce exposure. Decide whether your exposure risk is from intensity, frequency or length and implement controls.					
Orange Ratings	Reinforce Control Measures		Evaluate current controls and determine what further controls are needed.					
Green Rating	Monitor Existing Controls and Exposure		Continue to monitor the effectiveness of controls and take appropriate action when needed.					

International Council of Mining and Metals (2009) Good practice guidance occupational health risk assessment, UK.

Acknowledgement
This Focus On has been developed in consultation with various industry stakeholders from the NSW mining industry and endorsed by the NSW Mining and Extractives Industry Health Management Advisory Committee (HMAC). HMAC reports to the NSW Mine Safety Advisory Council and has membership from the NSW Minerals Council, Cement Concrete and Aggregates Australia; CFMEU, AWU, Coal Services, WorkCover NSW, NSW Trade & Investment and an independent health expert.

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