# HN1400 – OHS

# Chapter 4 – Physical Agents

# Chapter Objectives

**CHAPTER OBJECTIVES**

After reading this chapter, you will be able to do the following:

* Define the numerous terms related to physical agents.
* Explain the human reactions to various agents, particularly noise and radiation.
* Discuss the management of physical agents.
* Outline the actions of these agents on human physiology.
* With the use of the chapter appendix, understand the methods of calculating noise levels and exposure.

**CHAPTER SUMMARY**

Chapter 4 defines and explains the numerous terms, theories, and human health reactions related to four common physical agents encountered in industry: noise, vibrations, thermal stress, and radiation. It provides strategies that human resource managers can use to effectively manage these various physical agents. From implementing extensive specialized training and procedures for industries that encounter ionizing radiation to prevention policies and programs for reducing and controlling noise, vibrations, and thermal stress.

**Physical Agents**

Physical agents are sources of energy that may cause injury or disease in the workplace

Four common physical agents encountered in industry are noise, vibrations, thermal stress, and radiation.

• physical agents are present in unexpected places (i.e. high school music rooms, hockey games) and activities (i.e.: walkmans, concerts)

• exposure to some physical agents may be inherent (professional musician)

• legislative standards indicate maximum tolerances and noise-induced hearing loss can occur below this exposure level

• issues are complex and solutions have to be evaluated for the risks they introduce to the environment.

**Noise**

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| --- |
| **See Workers’Compensation Board of BC video/DVD: The Hearing Video** [**http://www.healthandsafetycentre.org/i/hearing/TheHearingVideo\_scan.jpg**](http://www.healthandsafetycentre.org/i/hearing/TheHearingVideo_scan.jpg) |

Noise is any unwanted sound.

Human hearing response is a condition of three characteristics:

1. Frequency
2. Duration
3. Loudness

**Hearing Loss**

Types of hearing problems arise from noise in the workplace

1. Physiological (conductive/sensorineural)
2. Sociological
3. Psychological

**Noise Exposure Standards**

Maximums set out by regulations

**Noise Control**

At the Source

Along the Path

Human Protection Noise TED talk: <http://www.ted.com/talks/julian_treasure_the_4_ways_sound_affects_us>

**Vibration**

Whole Body Vibration

Segmental Vibration

Resonance

Link: Effects of Whole Body Vibration: <https://www.youtube.com/watch?v=0SeJfbr2cH4>

**Thermal Stress**

Focus on extremes of temperature

Homeostasis – balance

Conduction

Convection

Radiation

Link: The Dangers of Heat Stress <https://www.youtube.com/watch?v=xfRsTNhGv8U>

**Radiation**

Ionizing Radiation eg: X rays

Addressed with monitoring, shielding, job rotation, protection & extensive training

Links: Radiation Effects on Humans: <http://youtu.be/ZZPZfDnJaGM>

Non-Ionizing radiation eg: UV light

Addressed with: Isolation, separation, protection & training

Links: Non ionization radiation <http://youtu.be/QB9d4IMjaZo>