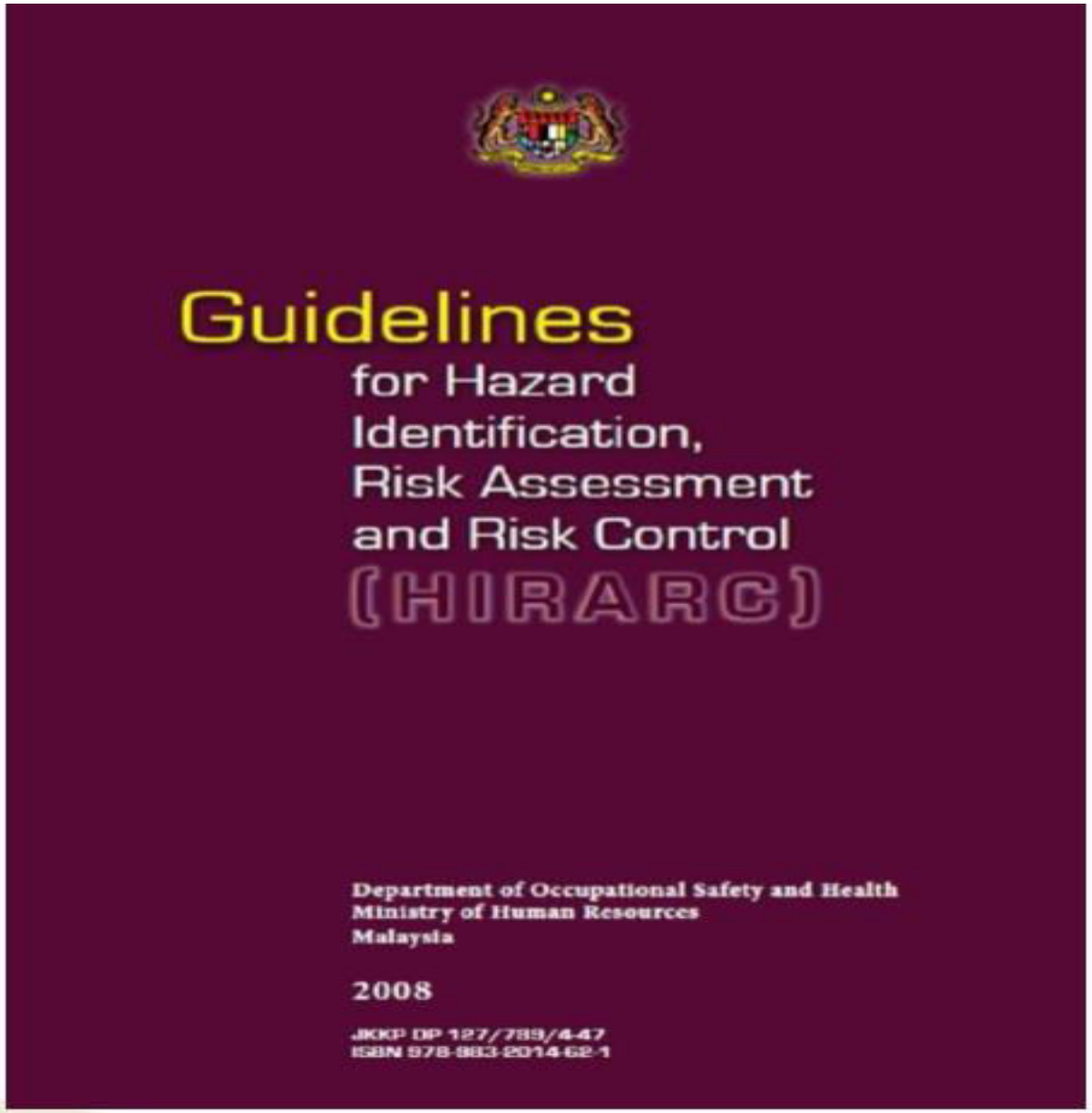
HIRARC

- Guidelines for Hazard Identification, Risk Assessment and Risk Control
- Published by Department of Occupational Safety and Health (DOSH) 2008.



WHAT IS HIRARC?

Identify hazard source or situation

Estimate level of risk and determine tolerability

Reduce or eliminate risk

DOCUMENTING HIRARC

JKNJ/KPAS/HIRARC/v1.0

JABATAN KESIHATAN NEGERI JOHOR
UNIT KESIHATAN PEKERJAAN & ALAM SEKITAR

BORANG HIRARC (HIRARC FORM)

Jabatan/Unit/Makmal/Wad/Stor:		Disediakan Oleh: (Nama, Jawatan)			
Proses Kerja/Lokasi:					
Disahkan Oleh: (Nama, Jawatan, Tandatangan)		Tarikh Disediakan:	(dari)	hingga	
		Tarikh Disemak:			
Tarikh Disahkan:		Tarikh Semakan Semula:			

1. Pengenalpastian Hazard				2. Analisis Risiko				3. Kawalan Risiko	
Bil.	Aktiviti Kerja	Hazad	Yang Boleh Mengakibatkan/Kesan	Kawalan Risiko (sedia ada)	Kebarangkalian (A)	Keterukan (B)	Tahap Risiko (AxB)	Langkah Kawalan Yang Disarankan	Orang Bertanggungjawab (Tarikh Tamat/Status)
1									

HIRARC FLOWCHART

TYPE OF HAZARDS

PHYSICAL

Slippery floors, electric shock, sharp object, height, fire, radiation, magnetic fields, pressure, noise, etc.

CHEMICAL

Depends on the physical, chemical and toxic properties of the chemical

BIOLOGICAL

Pathogens, bacteria, viruses, insects, plants, birds, animals, and humans, etc.

ERGONOMIC

Repetitive movements, improper set up of workstation, poor design of equipment, workstation design, (postural) or workflow, manual handling, etc.

PSYCHOSOCIAL

Shift work, workload, dealing with the public, harassment, discrimination, threat of danger, constant low-level noise, stress, violence, etc.

RISK ASSESSMENT

Risk can be presented in variety of ways to communicate the results of analysis to make decision on risk control.

For risk analysis that uses likelihood and severity in qualitative method, presenting result in a risk matrix is a very effective way of communicating the distribution of the risk throughout a plant and area in a workplace.

Risk can be calculated using the following formula:

L (Likelihood) x S (Severity) = Relative **Risk (RR)**

LIKELIHOOD OF OCCURANCE

This value is based on the likelihood of an event occurring. You may ask the question “How many times has this event happened in the past?” Assessing likelihood is based worker experience, analysis or measurement.

LIKELIHOOD (L)	EXAMPLE	RATING
Most likely	The most likely result of the hazard / event being realized	5
Possible	Has a good chance of occurring and is not unusual	4
Conceivable	Might be occur at sometime in future	3
Remote	Has not been known to occur after many years	2
Inconceivable	Is practically impossible and has never occurred	1

Table A

SEVERITY OF HAZARD

Severity can be divided into five categories. Severity are based upon an increasing level of severity to an individual's health, the environment, or to property. Table B indicates severity by using the following table:

SEVERITY (S)	EXAMPLE	RATING
Catastrophic	Numerous fatalities, irrecoverable property damage and productivity	5
Fatal	Approximately one single fatality major property damage if hazard is realized	4
Serious	Non-fatal injury, permanent disability	3
Minor	Disabling but not permanent injury	2
Negligible	Minor abrasions, bruises, cuts, first aid type injury	1

Table B

RISK MATRIX TABLE

	Severity (S)				
Likelihood (L)	1	2	3	4	5
5	5	10	15	20	25
4	4	8	12	16	20
3	3	6	9	12	15
2	2	4	6	8	10
1	1	2	3	4	5

Table C

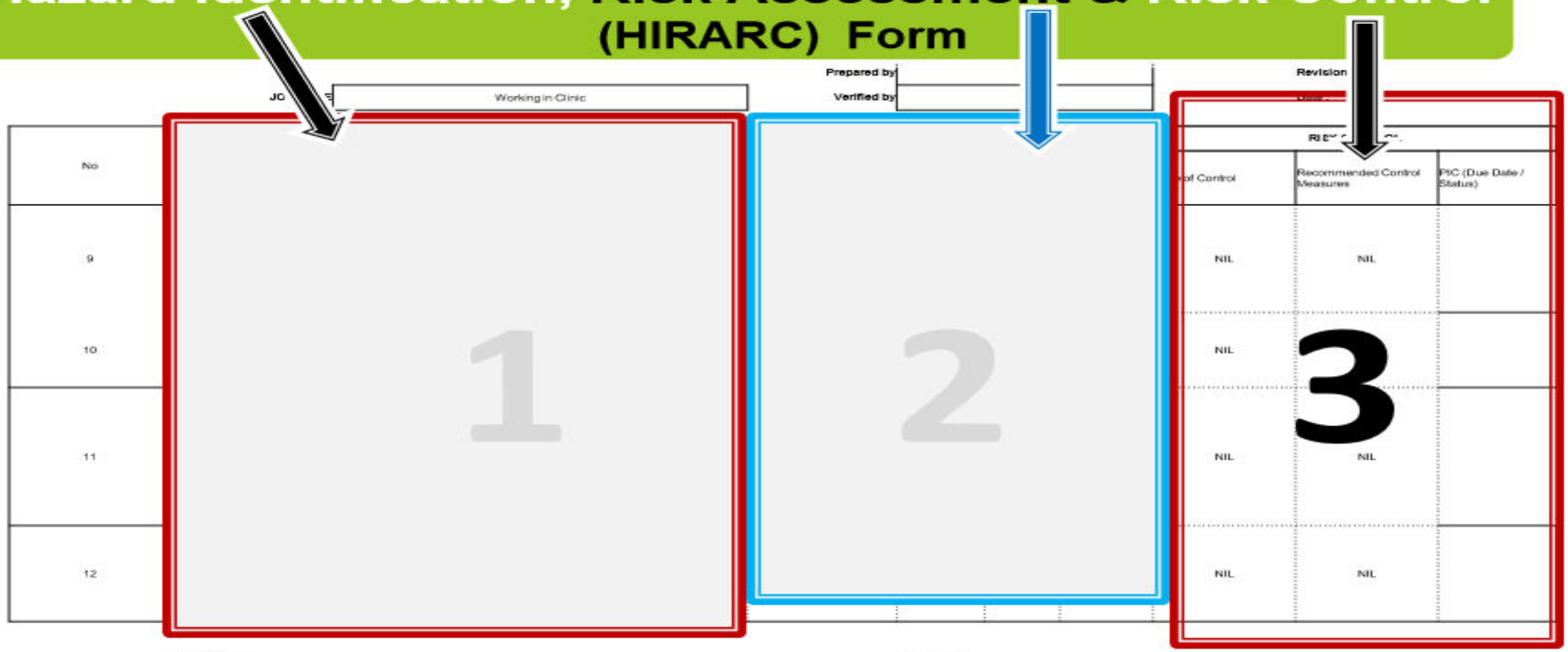
LOW MEDIUM HIGH

RISK PRIORITY TABLE

RISK	DESCRIPTION	ACTION
15 - 25	HIGH	A HIGH risk requires **immediate** action to control the hazard as detailed in the hierarchy of control. Actions taken must be documented on the risk assessment form including date for completion.
5 - 12	MEDIUM	A MEDIUM risk requires a planned approach to controlling the hazard and applies temporary measure if required. Actions taken must be documented on the risk assessment form including date for completion.
1 - 4	LOW	A risk identified as LOW may be considered as acceptable and further reduction may not be necessary. However, if the risk can be resolved quickly and efficiently, control measures should be implemented and recorded.

Table D

Hazard Identification, Risk Assessment & Risk Control (HIRARC) Form



LIKELIHOOD

Most Likely (5)	The most likely result of the hazard / event being realised
Possible (4)	Has a good change of occuring and is not unusual (1-5 years)
Conceivable (3)	Might be occur at sometime in future (5-10 years)
Remote (2)	Has not been known to occur after many years (10 yrs)
Inconceivable (1)	Is practically impossible and has never occurred

SEVERITY

Catastropic (5)	Numerous fatalities
Fatal (4)	Approximately one single fatality
Serious (3)	Non-fatal injury, permanent disability or > 4 days MC
Minor (2)	Disabling but not permanent injury or 1-4 days MC
Negligible (1)	Minor abrasions, bruises, cut, first aid type injury

RISK = LIKELIHOOD X SEVERITY

15 - 25 : HIGH RISK **5-12 MEDIUM** **1 - 4 : LOW RISK**

CONTROL

Control is the elimination or inactivation of a hazard in a manner such that the hazard does not pose a risk to workers who have to enter into an area or work on equipment in the course of scheduled work.

Hazard Identification, Risk Assessment & Risk Control (HIRARC)

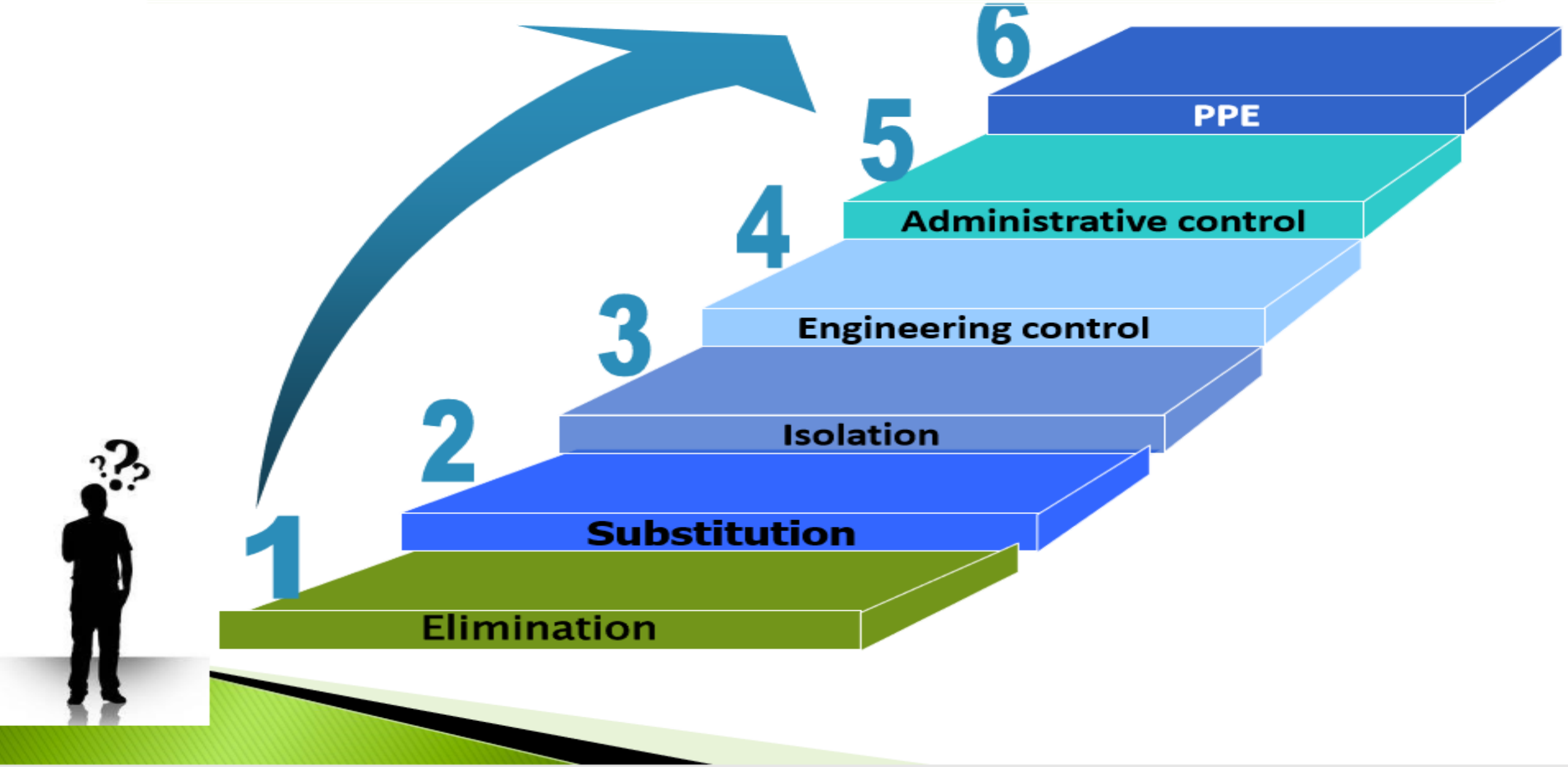
Safety

freedom from unacceptable risk of harm

Tolerable Risk

Risk that has been reduce to a level that can be accepted by the organisation having regard to its legal obligations and its own OH&S policy.

HIERARCHY OF CONTROL



HIERARCHY OF CONTROL

1. ELIMINATION

- Remove hazard from workplace
- Get rid the hazardous job, tools, process, equipment, machines or substances

HIERARCHY OF CONTROL

2. SUBSTITUTION

- Doing the same work in less hazardous way.
- Replace of substances with a less hazardous substances.

HIERARCHY OF CONTROL

3. ISOLATION

- Keep hazard away from workers
- Install guard, barrier
- Lockout system
- Safe clearance

HIERARCHY OF CONTROL

4. ENGINEERING CONTROL

- Modification
- Redesign
- Local exhaust ventilation

ENGINEERING CONTROL

REDESIGN

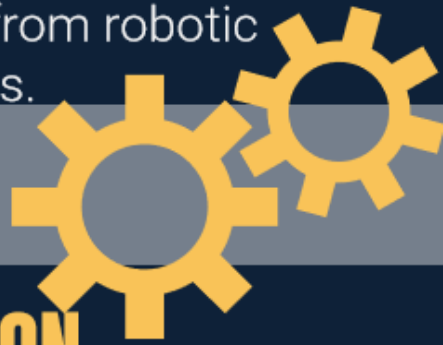
Jobs and processes can be reworked to make them safer. For example, containers can be made easier to hold and lift.

ISOLATION

If a hazard cannot be eliminated or replaced, it can some times be isolated, contained or otherwise kept away from workers. For example, an insulated and air-conditioned control room can protect operators from a toxic chemical.

AUTOMATION

Dangerous processes can be automated or mechanized. For example, computer-controlled robots can handle spot welding operations in car plants. Care must be taken to protect workers from robotic hazards.



BARRIERS

A hazard can be blocked before it reaches workers. For example, special curtains can prevent eye injuries from welding arc radiation. Proper equipment guarding will protect workers from contacting moving parts.

ABSORPTION

Baffles can block or absorb noise. Lockout systems can isolate energy sources during repair and maintenance. Usually, the further a control keeps a hazard away from workers, the more effective it is.

DILUTION

Baffles can block or absorb noise. Lockout systems can isolate energy sources during repair and maintenance. Usually, the further a control keeps a hazard away from workers, the more effective it is.

HIERARCHY OF CONTROL

5. ADMINISTRATIVE CONTROL

- Implement policies, procedures and training.
- Signages
- Supervision
- Inspection

ADMINISTRATIVE CONTROL

Safe work procedures

Workers can be required to use standardized safety practices. The employer is expected to ensure that workers follow these practices. Work procedures must be periodically reviewed with workers and updated.

Supervision and training

Initial training on safe work procedures and refresher training should be offered. Appropriate supervision to assist workers in identifying possible hazards and evaluating work procedures.

Job rotations

Reduce the time that workers are exposed to a hazard. For example, workers can be rotated through jobs requiring repetitive tendon and muscle movements to prevent cumulative trauma injuries. Noisy processes can be scheduled when no one is in the workplace.

Housekeeping, repair and maintenance programs

Housekeeping includes cleaning, waste disposal and spill cleanup. Tools, equipment and machinery are less likely to cause injury if they are kept clean and well maintained.

Hygiene

Hygiene practices can reduce the risk of toxic materials being absorbed by workers or carried home to their families.

HIERARCHY OF CONTROL

6. PPE

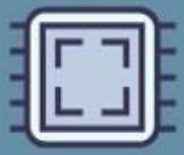
Safety helmet, mask, safety shoe, apron, rubber mat, gloves, ear muff etc.

PERSONAL PROTECTION EQUIPMENT

Personal protective equipment (PPE) and clothing is used when other controls measures are not feasible and where additional protection is needed. Workers must be trained to use and maintain equipment properly. The employer and workers must understand the limitations of the personal protective equipment. The employer is expected to require workers to use their equipment whenever it is needed. Care must be taken to ensure that equipment is working properly. Otherwise, PPE may endanger a workers health by providing an illusion of protection.

PPE is acceptable only in the following situation :

According to OSHA, PPE is acceptable as a control method in the following situations:



When engineering controls are not feasible or do not completely eliminate the hazard

While engineering controls are being developed

When administrative controls and safe work practices do not provide sufficient protection

During emergencies when engineering controls may not be available or feasible for use

https://www.e-hazard.com/blog/hierarchy-of-controls-approach-to-workplace-hazards/

Hierarchy of Controls

Most Effective

- **Elimination of hazard**—remove sharps and needles and eliminate all unnecessary injections. Jet injectors may substitute for syringes and needles. Other examples include the elimination of unnecessary sharps like towel clips, and using needleless IV systems.
- **Engineering controls**—examples include needles that retract, sheathe or blunt immediately after use.
- **Administrative controls**—policies aimed to limit exposure to the hazard. Examples include allocation of resources demonstrating a commitment to health care worker safety, a needlestick prevention committee, an exposure control plan, removing all unsafe devices, and consistent training on the use of safe devices.
- **Work practice controls**—examples include no re-capping, placing sharps containers at eye-level and at arms reach, emptying sharps containers before they're full, and establishing the means for safe handling and disposing of sharps devices before beginning a procedure.
- **Personal Protective Equipment (PPE)**—barriers and filters between the worker and the hazard. Examples include eye goggles, gloves, masks, and gowns.

Least Effective

Hierarchy of Infection Control Measures

Medic Footprints

Ways Doctors & HCW can reduce their COVID-19 exposure

Most effective

Remove exposure

Avoid face 2 face consultations,
use tele-consultations,
work from home (with no patients!)

Substitute exposure

Administer aerosolised medicine with spacers instead of nebulisers

Isolate yourself

Place physical barriers
Avoid physical exam of suspected/ known cases

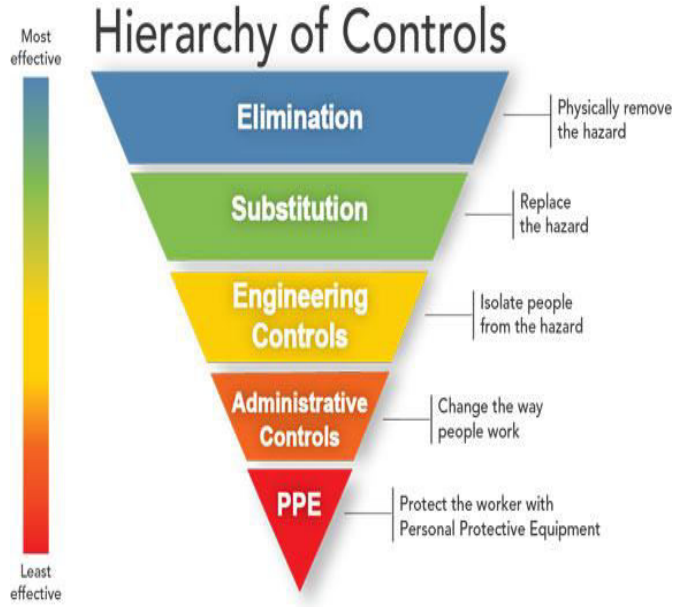
Change the way you work

Disinfect re-use equipment inc. computers,
reduce face to face time,
rotate b/w exposed & non-exposed roles

Least effective

Use PPE

Gloves, masks, gowns, scrubs



Source: CDC
https://www.cdc.gov/niosh/topics/hierarchy/default.html

HAZARD IDENTFICATION, RISK ASSESSMENT AND RISK CONTROL (HIRARC) FORM

RISK CONTROL		
Type of Control	**Recommended Control Measures**	**PIC (Due Date / Status)**
Administrative	Ensure availability of gloves and other protective equipment and cleansing agents	Mr. A (30/12/2012)
NIL	NIL	
Administrative	Train staff on proper lifting techniques	Mr. B (30/12/2012)
Administrative	Train staff on diffusing situations and intervention procedures	Mr. C (30/12/2012)

Kesimpulan

- Pengenalpastian hazard, penilaian risiko, kawalan dan semakan semula bukanlah suatu tugas yang dibuat sekali sahaja dan dilupakan tetapi ianya suatu aktiviti yang berterusan.
- HIRARC hendaklah didokumentasikan walaupun seringkas mana sekalipun.
- HIRARC hendaklah jalankan dengan penilaian teliti ke atas kebarangkalian dan juga kesan akibat manakala langkah kawalan yang dicadangkan hendaklah menepati hirarki kawalan

Hazard Identification, Risk Assessment & Risk Control (HIRARC) Form

JO[illegible]E: Working in Clinic

Prepared by:

Verified by:

Revision

Date :

No	HAZARD IDENTIFICATION				RISK ASSESSMENT				RISK CONTROL		
	Activities / Equipment/ Facilites	R/NR*	Hazard	Consequences	Current Risk Control	Likelihood	Severity	Risk Level	Type of Control	Recommended Control Measures	PIC (Due Date / Status)
9	Receive & treat patient	R	9.1 a) Exposure to known & unknown bacteria, fungal & viruses	9.1 a) Sick 9.1 b) Fatality	9.1 a) Competency & Proper PPE to be worn	2	2	4 (L)	NIL	NIL	
10	Clearing medical waste	R	10 a) Contact with sharp object	10.1 a) Sick 10.1 b) Fatality	10.1 a)Competency & Proper PPE to be worn	2	2	4 (L)	NIL		
11	Using X-ray machine	R	11 a) Exposure to radioactive and radiation	11.1 a) Cancer 11.1 b) Fatality	11 a) Competency & Proper PPE to be worn 11 b) Safe work distance, allowable exposure limit &	2	2	4 (L)	NIL	NIL	
12	Release Contamination / Hospital treated waste	R	12 a) Scheduled waste	12 a) Pollution to atmosphere, sanitary sewer, ground water, free water, soil	12 a) Competency & Proper PPE to be worn	2	2	4 (L)	NIL	NIL	

*R: Routine, NR: Non Routine

1 2 3

LIKELIHOOD

Most Likely (5)	The most likely result of the hazard / event being realised
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Conceivable (3)	Might be occur at sometime in future (5-10 years)
Remote (2)	Has not been known to occur after many years (10 yrs)
Inconceivable (1)	Is practically impossible and has never occurred

SEVERITY

Catastropic (5)	Numerous fatalities
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RISK = LIKELIHOOD X SEVERITY **15 - 25 : HIGH RISK** **5-12 MEDIUM** **1 - 4 : LOW RISK**

HAZARD IDENTFICATION, RISK ASSESSMENT AND RISK CONTROL (HIRARC) FORM

1

JOB TITLE : Working in Clinic

HAZARD IDENTIFICATION

No	Activities / Equipment/ Faculties	R/NR *	Hazard	Consequences
1	handling patients, contaminated objects, body secretions, tissue or fluids	R	Infectious Diseases	Hepatitis B, Hepatitis C and Human Immunodeficiency Virus (HIV) can be spread
2	Using X-ray machine	R	Exposure to radioactive and radiation	Cancer Fatality
3	Handling patients & moving objects	R	Heavy lifting and frequent bending or twisting when moving objects or patients	Back injuries
4	Dealing with angry and stressed patients and their families.	R	Health care workers are at risk from violence	Workplace violence can result in loss of sleep, fear or depression, post traumatic stress disorder

**R-Routine, NR - Non Routine*

HAZARD IDENTFICATION, RISK ASSESSMENT AND RISK CONTROL (HIRARC) FORM

2

RISK ASSESSMENT

Current Risk Control	Likelihood	Severity	Risk Level
Wash hands frequently (proper hand washing is the best way to prevent communicable diseases)	3	3	9 (M)
Competency & Proper PPE to be worn Safe work distance, allowable exposure limit	2	2	4 (L)
Use proper lifting technique	3	3	9 (M)
Follow policies and intervention guidelines	3	3	9 (M)

LIKELIHOOD		SEVERITY	
Most Likely (5)	The most likely result of the hazard / event being realized	Catastrophic (5)	Numerous fatalities
Possible (4)	Has a good change of occurring and is not unusual (1-5 years)	Fatal (4)	Approximately one single fatality
Conceivable (3)	Might be occur at sometime in future (5-10 years)	Serious (3)	Non-fatal injury, permanent disability or > 4 days MC
Remote (2)	Has not been known to occur after many years (10 yrs)	Minor (2)	Disabling but not permanent injury or 1-4 days MC
Inconceivable (1)	Is practically impossible and has never occurred	Negligible (1)	Minor abrasions, bruises, cut, first aid type injury

RISK = LIKELIHOOD X SEVERITY	15 - 25 : HIGH RISK	5-12 : MEDIUM RISK	1 - 4 : LOW RISK

HAZARD IDENTFICATION, RISK ASSESSMENT AND RISK CONTROL (HIRARC) FORM

3

RISK CONTROL

Type of Control	Recommended Control Measures	PIC (Due Date / Status)
Administrative	Ensure availability of gloves and other protective equipment and cleansing agents	Mr. A (30/12/2012)
NIL	NIL	
Administrative	Train staff on proper lifting techniques	Mr. B (30/12/2012)
Administrative	Train staff on diffusing situations and intervention procedures	Mr. C (30/12/2012)


рахмат
danke
謝謝
ngiyabonga
teşekkür ederim
spas
Баярлалаа
mersi
kia ora
barka
welalin
tack
mahalo
tapadh leat
спасибо
faafetai lava
vinaka
blagodaram
dank je
misaotra
paldies
grazzi
matondo
спасибі
kiitos
dankie
thank you
gracias
хвала
nanni
nandri
dhanyavad
mauruuru
asante
manana
bedankt
hvala
koszonom
aciū
obrigada
murakoze
tenki
bayarlalaa
gracie
dankon
enkosi
akun
djiere dieuf
tau
mochchakkeram
дякую
mamnun
dziękuję
chnorakaloutioun
gratias ago
gracies
sulpay
go raibh maith agat
chokrane
sobodi
dekuji
sagolun
sukriya
kop khun krap
taiku
obrigado
arigatō
takk
dakujem
trugarez
mesi
ありがとう
tanemirt
grazie
didi madloba
najis tuke
terima kasih
rahmet
ευχαριστώ
diolch
dhanyavadagalu
shukriya
merce
мерси
kam sah hamnida
rahmat
তোমাকে ধন্যবাদ
감사합니다
xiexie
merci