



BULETIN

UNIT KESIHATAN PEKERJA DAN ALAM SEKITAR
(KPAS)

JKN JOHOR BILANGAN 2/2020



KOSPEN Plus



ELECTRICAL HAZARD AND
HEALTHCARE WORKER
(PART 2)



EMF Radiation Exposure and Public
Health Concern

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KOSPEN PLUS

By Dr Suriya Kumareswaran

Employees are the most crucial asset for the productivity of a country. Most of the workers are among the healthy people, therefore disease prevention is very important and necessary to maintain the prosperity and well-being of the workers themselves and the individuals under their care. The World Health Organization estimates that 12.2 million die a year from non-communicable diseases while still working. Komuniti Sihat Pembina Negara (KOSPEN) Plus is an intervention program for the prevention of Non-Communicable Diseases (NCD) in the workplace. Its implementation is based on increasing the time employees are in the workplace.

The need to provide a level of safety, health and well-being in the workplace is contained in the Occupational Safety and Health Act 1994 (Act 514) and the Machinery Act 1967 (Act 139). Under Section 15 (1) of the Occupational Safety and Health Act 1994 (Occupational Safety and Health Act 1994) states that every employer must ensure the safety, health and welfare of employees at the optimum level. Similarly, under the same act, employees also have a responsibility to follow the employer's instructions in all aspects of safety and health (Section 24).

The KOSPEN Plus program was started in 2016, in line with the National Strategic Plan for Non-Communicable Diseases (2016-2025) to reduce the burden of non-communicable diseases among Malaysians. The program covers employees in the public and private sectors. The secretariat for this program is KOSPEN Plus Unit, Occupational Health and Environment Sector, Non-Communicable Diseases Branch, Ministry of Health Malaysia.

The Objectives of Kospen Plus

In general, the objective of the KOSPEN Plus Program implemented is to build healthy and productive employees with a conducive work environment towards the formation of a healthy work culture.

Specific objectives:

1. To raise awareness among employees to practice a healthy lifestyle
2. For early detection and non-communicable disease intervention
3. To increase productivity and competitiveness in the organization
4. To reduce medical costs directly and indirectly
5. To get an effective return on investment in human resources within the organization.

Benefits of Workplace Health Promotion

According to a study every 1USD spent on health programs can cause the cost of absenteeism to drop 2.73USD (Harvard University, Health Affairs 2010). Creating a healthy workplace for employees and preventing non-communicable diseases is one way in which organizations can meet the expectations of employees while bringing benefits to the organization or employer. The following is a list of benefits to organizations and employees if running a disease prevention program in the workplace

Organization	Workers
<ul style="list-style-type: none">• Increase worker morale• Increase productivity• Reduce employee absences• Reduce medical / insurance costs• Give a positive image to the employee	<ul style="list-style-type: none">• Improve health• Increase morale and self-confidence• Improve self and family welfare

Program Implementation

The KOSPEN Plus program is open to all public and private agencies. Any agency interested in implementing the KOSPEN Plus Program can contact the KOSPEN Plus Program Secretariat, Occupational Health and Environment Sector at the MOH Headquarters or at the Occupational and Environmental Health Unit, State Health Department respectively. Preliminary discussions between MOH officers and agency responsible officers were held. The KOSPEN Plus program implementation committee was formed and a coordinating team was appointed at the agency level. Training to the KOSPEN Plus coordinating team at the agency level is provided by the MOH. The coordinating team will conduct health screening to as many of their employees as possible. Next, from the screening data that has been collected, a health profile for the workplace can be generated and used as basic data for this program. The contents of the Health Profile are as below:

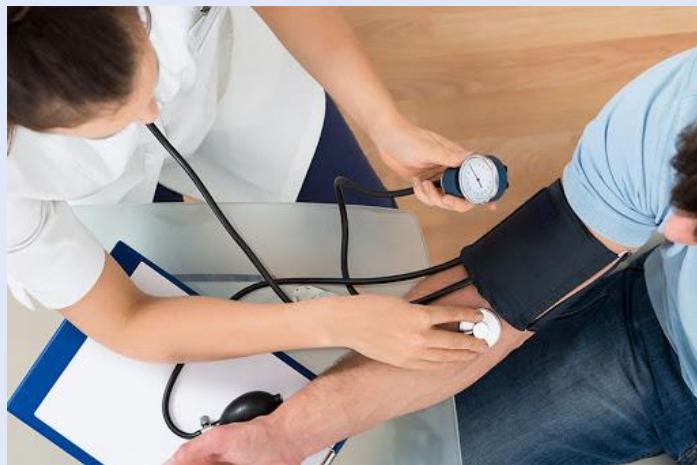
1. Number / percentage of workers with high glucose levels.
2. Number / percentage of employees with high blood pressure levels.
3. Number / percentage of overweight workers.
4. Number / percentage of obese workers.
5. Number / percentage of employees referred.
6. Number / percentage of employees at risk of having diabetes confirmed after referral.
7. Number / percentage of employees at risk of confirming hypertension after referral.
8. Number / percentage of employees smoking (As appropriate)
9. Number / percentage of smoking workers referred to smoking cessation clinic (As appropriate)

The health This Health Profile can also be used as a guide to plan and select activities that are suitable for employees through the implementation of the scopes in KOSPEN Plus. The effectiveness of the KOSPEN Plus program can be evaluated by generating workplace Repeat Health Profiles after the implementation of KOSPEN Plus activities.

Implementation Strategy

There are three parties in the KOSPEN Plus implementation strategy as below

Ministry of Health Malaysia	Employer	Coordinating Team
Provide technical expertise advisory assistance during training sessions including program supervision and monitoring	Role in giving commitment, solid support and ensuring the continuity of the program	Act as a functional unit in program implementation activities Carry out promotions, advocacy and provide health advice to colleagues



Scope of Health Screening

Health screening activities are conducted to identify employees who have non-communicable risk factors (NCD). By carrying out this activity, employers can find out the health status of their employees. Next, be able to implement interventions for the prevention of NCD risk factors. The frequency of screening of healthy participants is once a year

The objectives of health screening activities are as follows

- I. Detects non-communicable disease risk factors.
- II. Detecting non-communicable diseases at an early stage.
- III. Identify employee health status.
- IV. Implement intervention activities for those at risk.
- V. Encourage employees to undergo a health check-up.
- VI. Evaluate the effectiveness of the KOSPEN Plus Program

Health screening components

- i. Body mass index.
- ii. Measure your waist.
- iii. Glucose levels in the blood capillaries.
- iv. Blood pressure.
- v. Smoking status.
- vi. Healthy mind screening.
- vii. Alcohol dependence screening



Scope of Healthy Eating Practices

Healthy eating habits are very important elements to form a healthy body and intelligent mind. Healthy eating, such as foods / drinks that are low in fat, sugar and salt and high in fibre can make an individual free from any dangerous diseases, especially non-communicable diseases such as diabetes, hypertension and cardiovascular.

Control of the quantity and quality of food taken at work greatly affects the nutritional status because almost half of the daily time is spent at work. A supportive environment towards healthy eating in the workplace will help improve health status

Scope of Non-Smoking Practices

Working environment are non-smoking areas. The two main focuses for making the workplace free from any form of smoking practice are as follows:

Non-smoking environment in accordance with the provisions of the Tobacco Products Control Regulations

Smoking cessation screening and treatment at mQuit smoking cessation service



KOSPEN
@Activ 

Begin With Your First Step

Scope of Active life

There are many benefits of exercise that can increase the productivity and focus of an employee. Exercise can increase energy to perform daily tasks. It can also increase self-esteem, reduce anxiety and reduce mental stress apart from controlling blood pressure and strengthening the heart. To encourage active exercise and lifestyle, employers need to create an organizational atmosphere that supports an active lifestyle environment. Employers should encourage employees to adopt an active lifestyle



Scope of weight Management

The Weight Management Program (Trim & Fit) will be implemented by the KOSPEN Plus Coordinating Team with technical assistance from the Nutrition Science Officer (PSP). It is a weight management program conducted for 6 months consisting of three components namely:

- i. Nutritional Components
- ii. Exercise Components
- iii. Motivation Component



Scope of Mental Health

Employee mental health is closely related to top management. Employers who take care of the mental health of employees are able to increase the productivity of employees and companies. Positive-minded employers can create a healthy work environment. Therefore, employers need to have a positive perception of employees and not neglect activities that can promote mental health in the workplace.

This scope emphasizes on the implementation of a supportive environment and raising awareness of the importance of mental health, screening of mental health status, ways of acting and the role of employers in supporting a healthy environment.

How to raise awareness about mental health

- a) Recognize the early signs of mental health problems
- b) Reduce the stigma of mental health problems
- c) Understand what a mental health problem is and the cause of the problem

Mental Health Screening

The Mental Health Screening Form (DASS 21) will be distributed and given to employees to identify their level of mental health (stress, depression and anxiety). It comes with the Employee Registration Form.

Based on the results of Mental Health Screening (DASS 21), employees who are at a normal and light level will be involved in general interventions as well as promotional activities and mental health awareness. Meanwhile, for employees who are at a moderate level, severe and very severe, DASS screening is repeated along with other relevant questionnaires. The following is a list of possible interventions for employees:

- Relaxation techniques

- Anger control and conflict resolution
- Time management
- Problem solving and decision making
- Self-assertiveness (assertiveness)

Scope of Health Work Environment

A conducive work environment will foster a healthy life and motivate employees to increase competitiveness and productivity. The objectives of a Healthy Workplace Environment are as follows

- Evaluate existing infrastructure facilities in the workplace environment in contributing to a healthy workplace environment.
- Raise awareness and knowledge of healthy lifestyle.
- Assist employees in empowering themselves through awareness to use existing infrastructure facilities in the workplace.

Scope of Alcohol Prevention and Reduction

This module was created to provide guidance to the coordinating team to conduct health screening based on the pattern of alcohol consumption. Next for them to make appropriate initial interventions, to prevent and reduce the harm / danger of alcohol.

The specific objective of this module is to provide knowledge to the coordinating team in order to help play a role in the following activities:

- I. Empower the coordinating team to conduct alcohol use screening in the workplace by using the AUDIT-C questionnaire
- II. Identify the level of alcohol consumption in the screened community; as well as Provide guidance and advice related to alcohol consumption and its hard

SHARP INJURY SURVEILANCE JKN JOHOR 2020

Disediakan oleh: Matron Normah Binti Kassim

Jadual 1: Kadar Insiden Tertusuk Jarum Dalam Kalangan Anggota Kesihatan Berisiko, Negeri Johor, Januari – November 2020

Bil.	Kategori Anggota	Bilangan Terdedah	Bil. Tusukan Jarum	Kadar Tusukan /1,000
1	Pakar/Pegawai Perubatan	3923	31	7.9
2	Pakar/Pegawai Pergigian	657	5	7.6

3	Pen. Peg. Perubatan	1454	7	4.8
4	Juru. Tekn. Makmal Perubatan	577	1	1.7
5	Juruteknologi Pergigian	71	0	0.0
6	Pembantu Pembedahan Pergigian	328	2	6.1
7	Jururawat	6863	21	3.1
8	Penolong Jururawat/Bidan	0	0	0.0
9	Jururawat Masyarakat	1893	0	0.0
10	Jururawat Pergigian	176	0	0.0
11	Penolong pegawai kesihatan persekitaraan	375	0	0.0
12	Pembantu Perawatan Kesihatan	2792	0	0.0
13	Pegawai / Pembantu Farmasi	1191	9	7.6
14	Pembantu Kesihatan Awam	315	0	0.0





Surveilan Kecederaan Alatan Tajam / Sharp Injury Surveillance (SIS)

Sepanjang Jan – Nov 2020, terdapat 201 kes kecederaan alatan tajam telah dilaporkan. Majoriti kes SIS melibatkan *Needle Stick Injury* iaitu 166 kes (83%). Daripada jumlah tersebut, kes terbanyak adalah dalam kalangan Pegawai Perubatan Siswazah sebanyak 66 kes, (40%), diikuti oleh Pegawai Perubatan sebanyak 28 kes (17%), Jururawat 19 kes (11%) dan kakitangan Hospital Support Service 13 kes (8%).

Dibawah program ini, setiap kes kecederaan akibat alatan tajam yang dilaporkan akan melalui saringan penentuan risiko jangkitan virus HIV, Hepatitis B dan C serta diberi rawatan sehingga 6 bulan daripada tarikh insiden kecederaan.

Pelaporan NSI mengikut PTJ Unit KPAS menerima pelaporan kejadian tusukan jarum melalui sistem atas talian, iaitu online eKPAS menggunakan borang notifikasi *Sharp Injury Surveillance* (SIS) daripada semua fasiliti kesihatan di negeri Johor. Pada Jan –Nov 2020, kadar insiden tusukan jarum yang tertinggi adalah di Hospital, iaitu 9.4 berbanding Pejabat Kesihatan dan Pejabat Pergigian.

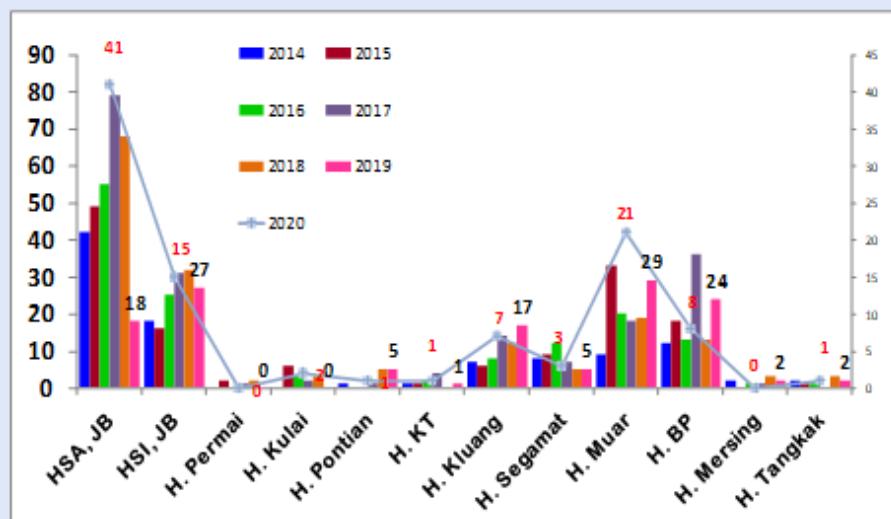
Jadual 2: Kadar Insiden Mengikut Fasiliti Kesihatan, JKN Johor

Kategori Fasiliti Kesihatan	Jumlah Anggota Berisiko	Bilangan NSI	Kadar Insiden /1000
Hospital	15883	150	9.4
	7321	9	1.2

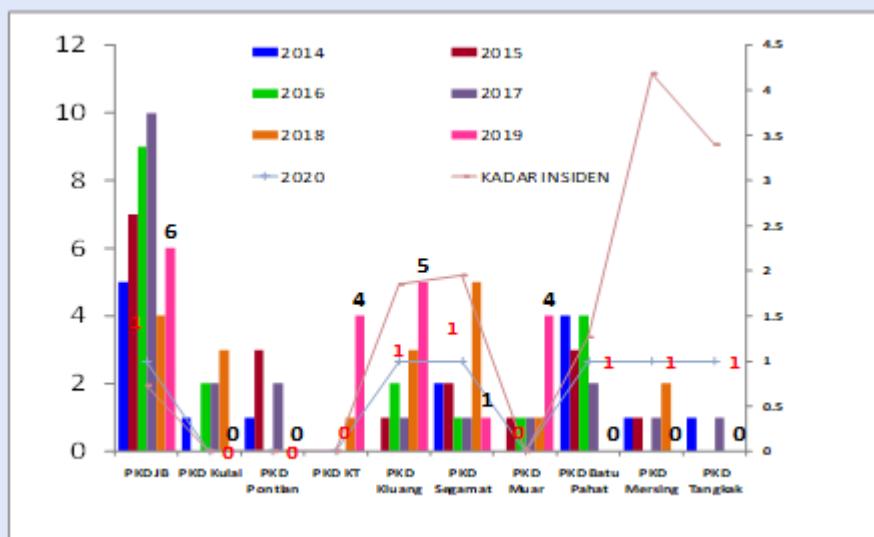
Pejabat Kesihatan			
Pejabat Pergigian	1358	7	5.1
Jumlah (Negeri Johor)	24562	166	6.8



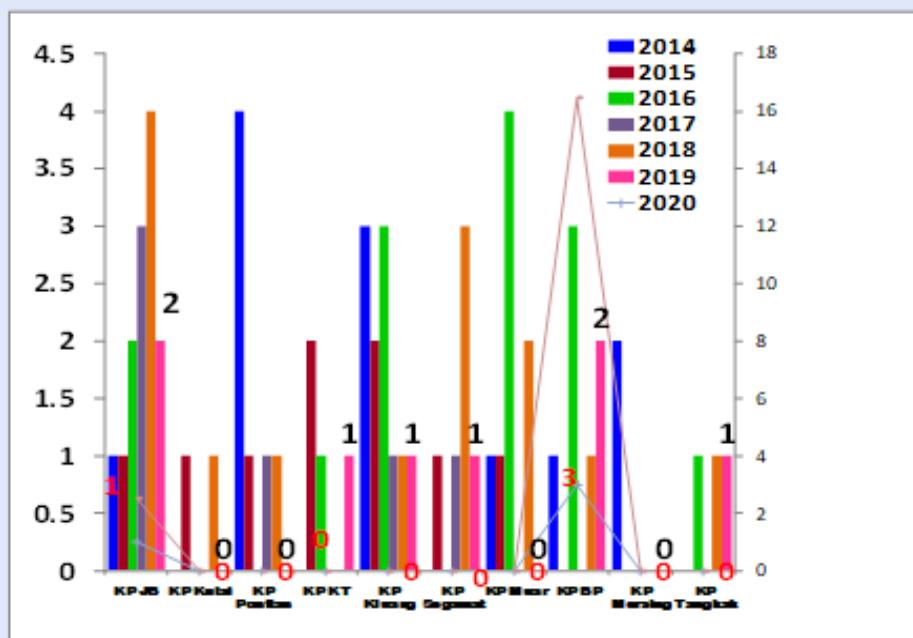
**Jadual 3: Kadar Insiden Mengikut Hospital, JKN Johor
Jumlah kes= 150**



**Jadual 4: Kadar Insiden Mengikut PKD, JKN Johor
Jumlah kes=9**



**Jadual 5 : Kadar Insiden Mengikut PPD, JKN Johor
Jumlah kes=7**



PENYAKIT PARU-PARU AKIBAT PEKERJAAN

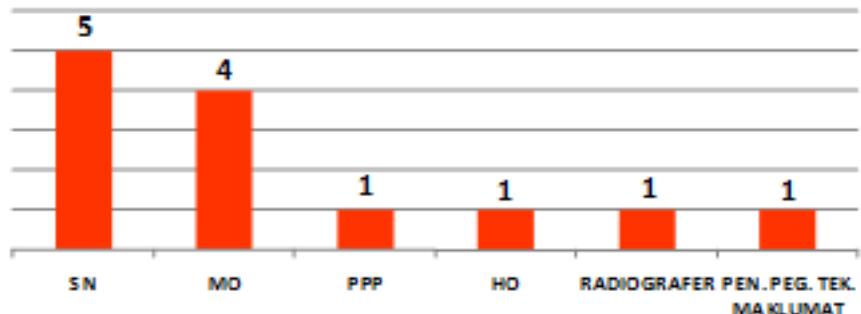
Disediakan oleh: Matron Normah Binti Kassim

Pada bulan Januari – Nov 2020, terdapat 13 kes jangkitan tuberkulosis melibatkan anggota kesihatan (Jadual 6). Kebanyakan daripada anggota yang dikesan mengalami tuberkulosis berusia dalam lingkungan umur 31-40 tahun, di mana anggota wanita lebih tinggi (88%) berbanding anggota lelaki. Pelaporan Pulmonary Tuberculosis adalah tinggi berbanding Extra Pulmonary iaitu sebanyak 89% (Jadual 7). Walaubagaimanapun, tiada perbezaan ketara dalam keputusan pemeriksaan kahak yang dijalankan keatas anggota Pegawai Perubatan dan Jururawat adalah dua golongan tertinggi yang telah dikesan mendapat tuberkulosis. Langkah kawalan dan tindakan pencegahan telah dijalankan bagi mengawal dan mencegah jangkitan di fasiliti-fasiliti kesihatan di Negeri Johor

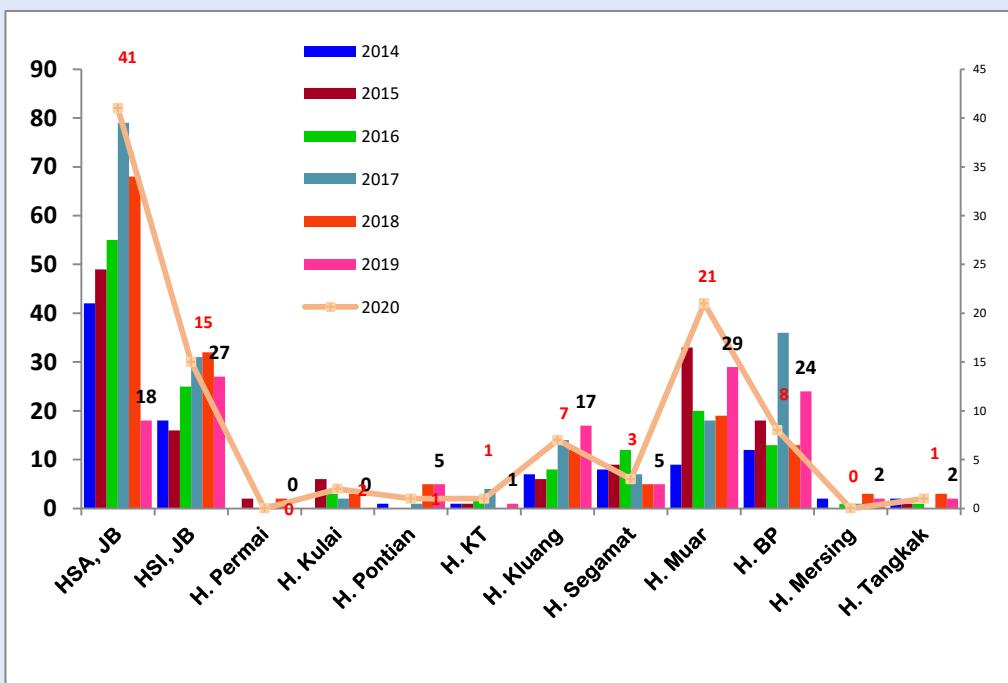


KATEGORI KAKITANGAN YANG MENDAPAT PENYAKIT TB JAN – NOV 2020

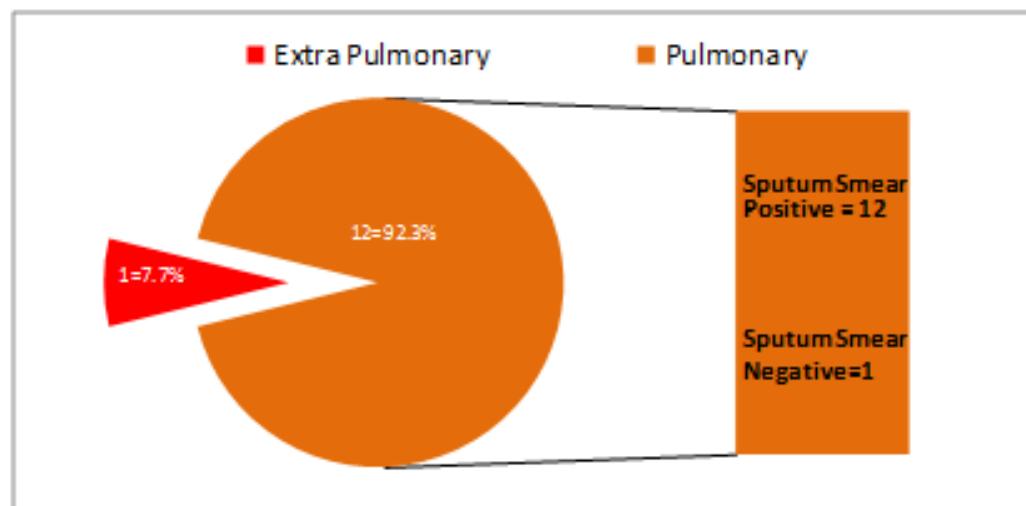
JUMLAH : 13



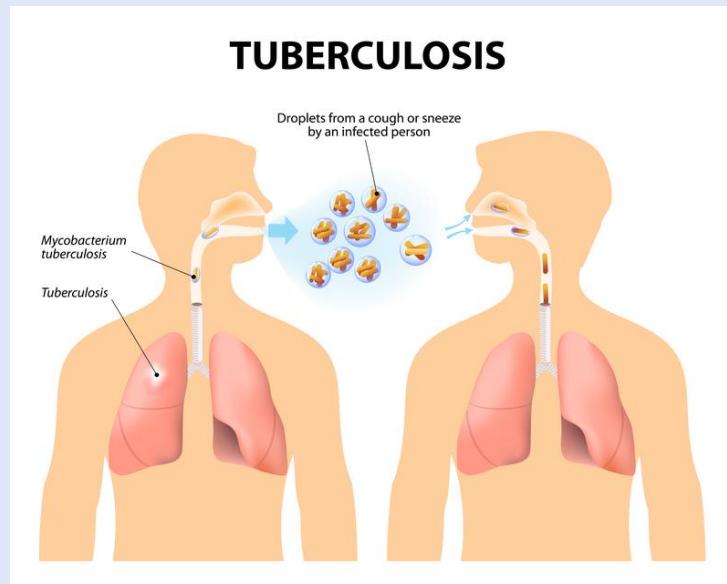
Jadual 6



JENIS TB DALAM KALANGAN ANGGOTA JAN – NOV 2020



100% of the staff been given medical leave following diagnosis
0 Fatality



Saringan Tuberculosis di kalangan anggota kesihatan dijalankan dua tahun sekali sejak pertengahan tahun 2012. Saringan ini adalah bertujuan untuk mengesan tanda-tanda awal Tuberculosis dan diberikan rawatan mengikut garispaduan Kementerian Kesihatan Malaysia. Namun, bukan semua anggota sedar untuk menjalani saringan Tuberculosis. Sehingga Jan – Nov 2020, hanya 21.2% daripada seluruh anggota kesihatan di negeri Johor telah berjaya membuat saringan Tuberculosis

Jadual 8 : Saringan Tuberculosis Anggota Kesihatan JKN Johor Januari – Nov 2020

Fasiliti	Jumlah Anggota	Saringan	% Saringan
Hospital	15883	3965	25.8
PKD	7321	958	13.1
PPD	1358	277	20.4
Jumlah	24562	5200	21.2

ELECTRICAL HAZARD AND HEALTHCARE WORKER

(Part 2: Risk Assessment, Preventive and Control Measures)

By: DR LOGANATHAN SALVARAJI & DR HAIDAR RIZAL TOHA

Risk assessment for Electrical Hazard

Every workplace should conduct risk assessment and this include identifying hazards and the control measure in the workplace. The analysis should include assessment of the risk presented by the hazards. The main aim to this assessment is to hinder accident or injury of workers and prevent disaster. Risk assessment can be carried out in three steps (Health & Safety Authority, Ireland):-

- 1) Identify the hazards
- 2) Assess the risks
- 3) Put the control measures in place

In Malaysia, Department of Occupational Safety and Health (DOSH) has published a guideline for risk assessment known as Guidelines for Hazard Identification, Risk Assessment and Risk Control (HIRARC). In this guideline, risk assessment utilized two thematic component which is likelihood and severity in order to measure the magnitude and priority of the hazards. Each part of likelihood and severity is adapted and adjusted into a scale of 0 to 5. Likelihood is defined as frequency of the event occurring during the work process. It is scaled ranging from most likely (5) till inconceivable (1) (Table 1). Meanwhile, severity reflect the health effect, property damage and environment impact due to the hazard exposure. Severity is scaled ranging from catastrophic (5) till negligible (1) (Table 2). Finally, both theme of likelihood and severity is multiplied to establish the risk matrix. Risk matrix is colour coded into red (high risk), yellow (medium risk) and green (low risk) (Table 3).

Table 1: Scaling for Likelihood

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

Source: (DOSH, 2008)

Table 2 : Scaling for Severity

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

Source: (DOSH, 2008)

Table 3 : Risk Matrix evaluation at workplace (Likelihood x Severity)

		Severity (S)				
		1	2	3	4	5
Likelihood (L)	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

High	
Medium	
Low	

Source: (DOSH, 2008)

For example, in a study for health effect due to surgical smoke in Hospital Serdang highlighted prevalence of 58.7% among healthcare workers (Mohd Fikri R & Titi Rahmawati H, 2019). Majority of staff experienced acute effect. No chronic or death was documented due to surgical smoke. Therefore, the likelihood gives a score of 4 since there is a possibility of occurrence and the severity of 2 for minor and acute effect. The risk matrix is 8 (4x2) which gives us a yellow alert and the risk is medium. Temporary measures must be applied to control the risk.

Table 4 : Risk colour coding and action

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.

Source: DOSH, 2018

Electrical Hazard Control Measures in Hospital

Risk control is defined as action to eliminate or inactivate hazard. In another word, it is an implementation of measures that is as far as practicable during work process to minimize risk of adverse health effect or property and environmental damage. Traditionally, there are few types of control presented in hierarchy of control. Hierarchy of control further explained into elimination, substitution, isolation, engineering, administrative and personal protective equipment's (PPE). Hence, workplace assessment for control is evaluate according to this hierarchy (Figure 1)

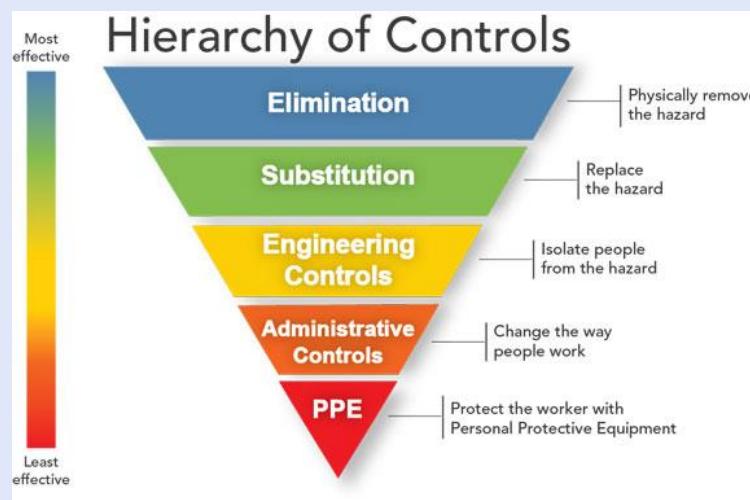


Figure 1 : Hierarchy of control (elimination, substitution, engineering control, administrative controls and PPEs).

Source : (NIOSH, 2018)

As an example, Accident and Emergency Department in a hospital consist of few sections such as Triage, Green Zone, Yellow Zone and Red Zone. An assessor can focus on electrical hazard in a red zone and utilize hazard control in accordance to Hierarchy of Control. Figure 2 show the condition of a bed cubicle in Red Zone.



Figure 2 : Cubicle in Red Zone in a hospital's Accident and Emergency Department.

- a) Elimination
 - i. We cannot eliminate the fire hazard because usage of electrical equipment is always present.
- b) Isolation
 - ii. Patient care are isolated from according to zones hence, a fire hazard in a cubicle in Red Zone can be separated from another cubicle and also from Yellow and Green Zone
 - iii. Each cubicle has their own designated electrical equipment's to be used
- c) Engineering
 - i. Wiring are cord properly insulated
 - ii. Earthing of electrical equipment
 - iii. Sufficient space with electrical equipment's and worker able to move freely to delay fire spread
- d) Administrative
 - i. Listing and labelling of electrical equipment's that can be visible.
 - ii. Ensure all electrical equipment's are far from water sources.
 - iii. Periodic maintenance of electrical equipment
 - iv. Shift working to reduce exposure to hazard.
 - v. Awareness and training for staff about electrical hazard once a month. For example: Advice staff not to touch electrical equipment's with wet hand.

- vi. Continuous Education on electrical hazard and table top or real scenario exercise.
 - vii. Establish Occupational Safety and Health policy in the department and ensure worker adhere to items mention in the policy.
 - viii. Hazard Identification, Risk Assessment and Risk Control every year as require by DOSH guideline.
 - ix. Annual Fire Safety Audits
 - x. Regular update and discussion of electrical hazard status during safety and health committee meeting.
- e) PPE
- i. Fire retardant suit is appropriate if the hospital has an in-house fire suppression team

Preventive Measure of Electrical Hazard in Hospital

In term of Occupational Health and Safety, prevention require a holistic approach involving employer and employee. Both parties work hand in hand to avoid accidents, injuries, incidents, minimize or eliminate safety and health risk. It is the responsibility of employee to provide a safe and healthy working condition. To implement effective control and prevention it is suggested that: -

- a) Workers should be involved because they best understand the environment that create hazards and how to control it.
- b) Hierarchy of control need to be implemented and evaluated
- c) Establish hazard control plan to guide selection
- d) Form an emergency and nonroutine activities to protect workers
- e) Review on new methods or technology that have potential to protect workers, more reliable or less costly.

Recommendation for Electrical Fire Hazard Management in Hospital

Hospital are well known for biological hazards. Nevertheless, recent incident of fire breakout in hospitals highlighted that electrical hazards too is top crucial issues in a hospital setting. This is because it threatens the lives of occupants and can cause property damage that cost millions of Ringgit. Hospital management need to identify high risk area that potentially can cause electrical injury or accident. This area can be analysed according to usage and procurement of high voltage machines such as at radiology department, operation theatre, intensive care unit, endoscopy room etc. Electrical hazard can cause devastating impact in hospital and is identified as main culprit to start fire. This have been revealed in most of the forensic reports by the fire and rescue team. Damaged wire or short circuits had cause major fire. A hospital has high potential for fire because it is equipped with fire prone material such as oxygen tank, flammable medication, reagent for laboratory test, treatment with plastic etc.

Electrical hazard can result in serious health effect to workers as well as patient in the ward. The severity of the condition depends on the electrical factors such as voltage, current pathway, type of current etc. Healthcare works are at risk of sustaining at least second degree burn when in contact with electrical current. The risk increases when the current pass though heart or brain that can lead to cardiac arrhythmia, respiratory arrest and brain death. In some of the cases, the victim needs to undergo limb amputation and thus live with disability.

As stated in Occupational Safety and Health Act 1994, employer ie. hospital management must take the responsibility to ensure working condition or environment must be safe for employers and client. Proportionally, employees and clients must adhere to Occupational Safety and Health policy of the hospital. This includes to follow safety procedures and not to attempt any high-risk behaviour. OSH committee must also play a role in assessing electrical hazards and be proactive to solve the problem urgently. Dangerous occurrences such as sparks, accident or injury must be notified to the management according to Notification of Accident, Dangerous Occurrence, Occupational Poisoning and Occupational Disease (NADOPOD) Regulation 2004.

Recommendation for managing electrical hazards: -

- a) Isolation
Space must be sufficient to place electrical device and movement of occupants. This will reduce chance of contact with electrical current. Healthcare workers can manipulate the device conveniently and more focus to prevent any errors.
- b) Substitution
Replace electrical device with device better safety features. Currently, there are medical devices with latest and new technology in a smaller size and require only low voltage current supply. For example, traditional bigger ultrasound machine can be replaced with mobile scan during Focussed Assessment with Sonography in Trauma (FAST scan).
- c) Engineering
Medical device is altered to reduce the risk electrical injury or accident. This can be done by placing the device at the safer site. Modification of the site can prevent any fall of the device, damage to wire and plug or contact with water. For examples, multiple wires in the floor can cause fall or contact of worker with current. Therefore, it is essential to design in a way the wires are safely cord together and arranged at the side.
- d) Administration
Administration control include prevention programme for the healthcare workers to hinder any electrical injury or accident. It is a comprehensive approach which include assessment of OSH policy and OSH committee role in the department. Besides that, analysing notification of accident and injury at workplace will give additional information to sketch the programme. This analyse include pitfalls and suggestion to improve and prevent future incidents. Health surveillance programme can be conducted to ensure healthcare workers are in good condition to full fill their job task as stated in job description. Workers with abnormal result must be referred and assessed by Occupational Health Doctor (OHD) to get clearance Fitness to Work (FTW). Meanwhile, workers who sustain injury must go through Return to Work (RTW). RTW will ensure capability of the worker to complete the job task and not putting himself or others in danger. Compensation also can be applied to aid injured worker. For government hospital healthcare workers, they are entitled to apply for Ex-Gratia, meanwhile private hospital state can apply for SOCSO (Social Security Organization) compensation.

Training and awareness are important spec of prevention program. All new workers at the department must undergo orientation at the department. This includes fire floor plan, fire extinguisher availability, reporting accident and incidents, auditing workstation etc. Self-assessment audit (*audit kendiri*) must be performed every three

months as stated in OSHA 1994. The finding of the audit needs to be presented during OSH committee meeting for solution and action of improvement.

e) Personal Protective Equipment's

PPE's requirement depends on the workstation and hazard exposure. PPE's worn concurrently to protect against other hazards as well such as biological and chemical. Nevertheless, it is advisable to keep the PPE's dry as water is a good conductor for electrical current.

Health Surveillance Programme

The health surveillance will ensure that the staffs are well protected from hazards at workplace or well managed if they have been exposed to them. Usually directed at managing hazards such as biological and chemical in origin, an assurance of healthy workers identified via medical examination during such surveillance would aid in selection of fit workers in a high risk of fire situation and work placement.

Conclusion Electrical Hazard in Hospital

In conclusion, electric hazard is a major threat in hospitals that require sustainable assessment and improvement. Workplace assessment and medical surveillance system is often overlooked and some employees failed to comply to the necessary measures that have been instructed at the workplace. This can be attributed to lack of knowledge regarding occupational safety and health and lack of awareness with regards to its importance. The consequences of neglecting these assessments may result in health deterioration, low work quality and may also cause disability and impairment. Workplaces in general should adopt workplace assessment in the aim to improve overall health of all the workers which then lead to increase productivity in terms of quality in health service. Therefore, recommendations that are outlined above are practical and feasible and with the implementation of these suggested recommendations, it will hopefully result in safer and healthier working environment.

EMF Radiation Exposure and Public Health Concern

by Azlan bin Safian, UKRP, JKN Johor

A look at the news headlines of recent years allows various insights of public concern. Over the course of the past decade, numerous electromagnetic field sources have become as focus of health concerns, including power lines, microwave ovens, computer and TV screens, security devices, radars and most recently mobile phones and its base stations. As we all know, mobile phone communicates wirelessly with base station by using radio waves. These radio waves are also known as Radio Frequency wave (RF) which is a type of electromagnetic frequency wave (EMF).

When a call is made from a mobile phone, RF Signals are transmitted between its antennas to other antenna from a nearby station. Then, the call is routed through phone

network to the destination phone that is true base station. Base station antennas must be elevated and located clearly from any physical obstruction to ensure for wide coverage. Additional base station is needed for an area that has increasing mobile phone uses, even though the network coverage is already exists. This is to maintain quality service by network provider. By not doing that, the mobile network will not be able to operate properly and as a result, mobile phone users may not be able to connect to the network. For information, radio wave that radiated out from base station will degrade exponentially in the air once it is transmitted out from the antenna. Thus, a number of base stations are needed to ensure for good and quality signal reception to the subscribers.

However, users are more concern of base station compared to mobile phone itself. It is normal when we afraid of a giant structure like base station compared to a smaller mobile phone device, though it is the nearest daily use gadget to human, and definitely RF signals is radiated out from our mobile phone. We would like to have a good and quality signal reception but why do we deny the existence of a base station?

As we try to understand the radiation exposure to RF, it is better for us to go through the basic of EMF. EMF basically can be divided into two categories that are non-ionizing radiation and ionizing radiation (Figure 1.0). What is Ionization? Ionization occurred when sufficient external energy reaches an electron and it is removed from its orbit. By leaving the atom positively charged, it is known as ionized. Ionization could possibly cause a cancer. However, RF is categorized as a non-ionizing radiation as figure below. It is a low frequency and a low energy property. The low energy EMF can only cause electron to vibrate which is only generate heating to human tissue.

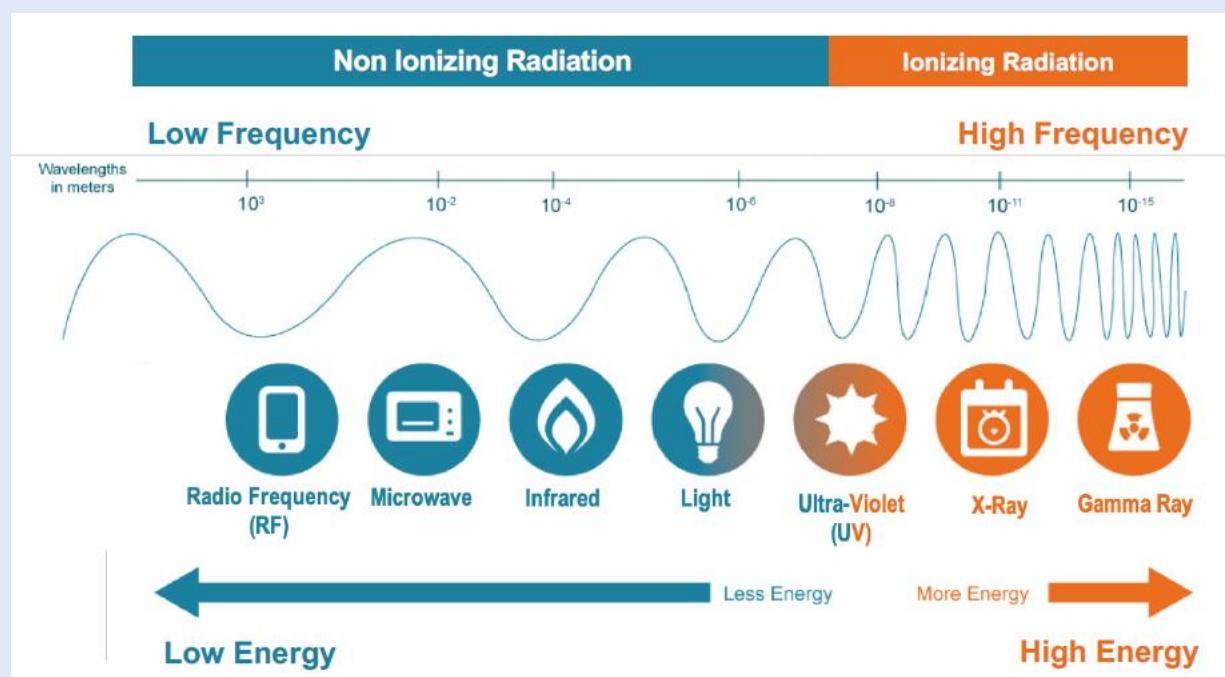


Figure 1.0 Electromagnetic Spectrum

Exposure to EMF, from natural sources or man-made sources, is not a new phenomenon. However, during the 20th century, environmental exposure to man-made electromagnetic fields has been steadily increasing as growing electricity demand, advance technologies and changes in social behavior have created more and more artificial sources. Everyone is exposed to a complex mix of weak electric and magnetic fields, both at home and at work. From the generation and transmission of electricity, domestic appliances and industrial equipment to telecommunications and broadcasting, it all contributes to EMF exposure.

In Malaysia, there is a regulatory body that regulates again this EMF that is Malaysian Communications and Multimedia Commission (MCMC). Based on *International Commission on Non-Ionizing Radiation Protection* (ICNIRP) standard, MCMC issued a Mandatory Standard (MS) in year 2010 entitled Commission Determination on the Mandatory Standard for Electromagnetic Field Emission from Radiocommunications Infrastructure". Network Facility Provider (NFP) / Network Service Providers (NSP) are required to submit EMF simulation report to MCMC to ensure their compliance with the Mandatory Standard. A guideline also was published by MCMC in year 2017 entitled "Guideline on The Mandatory Standard for Electromagnetic Field Emission from Radiocommunications Infrastructure (Compliance Towards Determination No. 1 of 2010)", MCMC(T)13-TDD/170/001 Jld. 1 (02) to limiting EMF exposure.

Extensive research has been performed to investigate whether mobile phones and base stations pose a potential health risk, including in Malaysia. All review conducted so far have indicated that exposures below the limits recommended in the ICNIRP EMF Guidelines, covering the full frequency range from 0-300Ghz, do not produce any adverse health effects. However, there are still gaps in knowledge that requires further research before long-term health risk assessments can be made.

Based on approximately 25,000 scientific research articles published over the past 30 years, WHO concluded as

"Current evidence does not confirm the existence of any health consequences from exposure to low level electromagnetic fields".

In term of EMF and cancer, WHO quote as "Despite many studies, the evidence for any effect remains highly controversial" and "Animal and laboratory studies fail to demonstrate any reproducible effects that are consistent with the hypothesis that fields cause or promote cancer". WHO also says public has attributed a diffuse collection of symptoms to low levels of exposure to EMF (e.g., headaches, anxiety, suicide, depression, nausea, fatigue, etc). However, to date, scientific evidence does not support a link between these symptoms and exposure to EMF.

KEBISINGAN DI TEMPAT KERJA BOLEH MEMBAWA PADAH

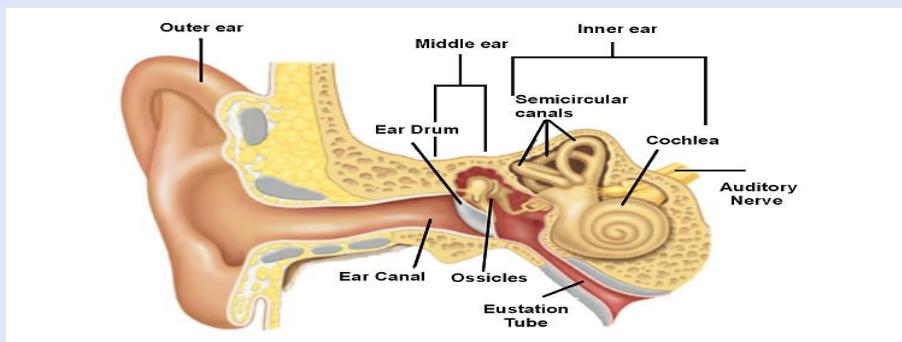
Disediakan oleh Dr. Mohd Syaiful Bin Mohd Aris



Hazard bunyi adalah bunyi yang tidak menyenangkan dan mengganggu konsentrasi pada telinga manusia sama ada ia datang dari mesin, bunyi kapal terbang ataupun tempat pembinaan dan menyebabkan masalah pada pendengaran.

Mengikut Peraturan 2004, Keselamatan dan Kesihatan Pekerjaan (notifikasi kemalaangan, kejadian berbahaya, keracunan dan penyakit pekerjaan) adalah menjadi tanggungjawab majikan dan pengamal perubatan yang merawat untuk melaporkan sebarang penyakit pekerjaan kepada Jabatan Keselamatan dan Kesihatan persekitaran (KPAS) di mana-mana Pejabat Kesihatan Daerah yang terdekat. Kesan kesihatan akibat pendedahan bunyi bising yang melampau boleh menyebabkan kerosakan telingan secara langsung dan tidak langsung. Pendedahan kepada bunyi yang kuat secara terus menerus boleh menyebabkan pengurangan sementara dalam sensitiviti pendengaran dan tinnitus. Pengurangan pendengaran ini boleh bersifat sementara dan bertahan selama beberapa jam bergantung kepada tahap pendedahan dan boleh menjadi kekal. Jika ia berterusan boleh menyebabkan kehilangan pendengaran sensorineural pada pesakit yang terjejas.

Fisiologi Pendengaran



Bunyi akan disalurkan ke dalam liang telinga dan menyebabkan gegendang telinga bergerak. Gegendang telinga akan bergetar mengikut bunyi. Getaran bunyi akan dipindahkan ke koklea menerusi osikel dan gegaran bunyi akan menyebabkan cecair di dalam koklea akan bergerak. Pergerakan cecair ini akan menyebabkan sel-sel rerambut membengkok dan menghasilkan isyarat neural yang akan dikutip oleh saraf auditori. Sel rerambut pada salah satu hujung koklea akan menghantar maklumat bunyi yang bernada rendah dan sel-sel rerambut yang lain akan menghantar maklumat bunyi yang bernada tinggi. Saraf auditori akan menghantar isyarat kepada otak di mana ia akan ditafsirkan sebagai bunyi.

Apa itu NIHL-Noise Induced hearing Loss?

NIHL boleh disebabkan oleh pendedahan satu kali pada bunyi "dorongan" yang kuat, seperti letupan, atau pendedahan berterusan terhadap bunyi yang kuat dalam jangka waktu yang lama, seperti kebisingan yang dihasilkan di sebuah kedai kayu. Kegiatan rekreasi yang dapat menjadikan risiko anda didiagnosa sebagai NIHL adalah termasuk menembak sasaran dan berburu, mendengarkan pemain MP3 dengan volume tinggi melalui earbud atau fon kepala, dan menghadiri konsert yang kuat. Bunyi berbahaya di rumah mungkin berasal dari sumber termasuk mesin pemotong rumput, peniup daun, dan alat kerja kayu. Selain itu bagi pekerjaan yang tidak asing di setiap Pejabat Kesihatan Daerah atau hospital adalah pendedahan kepada mesin "fogging". Pekerja yang melakukan "fogging" sangat terdedah dan harus diperiksa kepada pakar ENT sekurang-kurangnya setahun sekali bagi pemeriksaan audiometri.

Bunyi diukur dalam unit yang disebut desibel. Bunyi pada atau di bawah 70 (dBA), walaupun setelah lama terdedah, tidak mungkin menyebabkan kehilangan pendengaran. Walau bagaimanapun, pendedahan yang panjang atau berulang pada bunyi pada atau melebihi 85

dBA boleh menyebabkan gangguan pendengaran. Semakin kuat suaranya, semakin pendek jumlah masa yang diperlukan untuk NIHL berlaku.

Cara pencegahan NIHL



Kawalan pentadbiran, seperti memindahkan pekerja ke kawasan yang selamat atau mengehadkan masa mereka di sekitar gangguan suara, juga berkesan dalam mengurangkan pendedahan bunyi bising. Apabila kawalan kejuruteraan dan pentadbiran tidak berjaya mengurangkan pendedahan bunyi, alat pelindung pendengaran mesti digunakan.

Di Pejabat Kesihatan daerah terutama kepada “*foggers*”, perlu memakai earplug atau earmuff untuk mengelakkan daripada terjadi NIHL dikalangan staff kesihatan yang melakukan *fogging*.

SOALAN SERING DITANYA

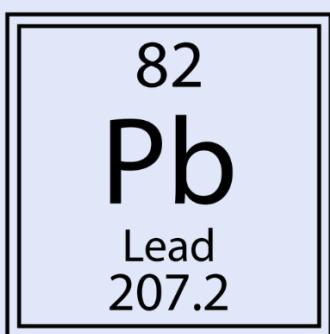
PLUMBUM DAN KESAN KEPADA KANAK-KANAK

By Dr Haidar Rizal Toha

Apa itu plumbum dan kenapa ia amat berbahaya kepada kanak-kanak?

Jawapan: Plumbum adalah sejenis logam berat yang sering digunakan manusia dan senang dijumpai di persekitaran terutama akibat pencemaran. Kesan buruk akibat dedahan kepada plumbum adalah lebih besar kepada kanak-kanak kerana:

- 1) Secara fisiologi, bayi dan kanak-kanak akan menyerap plumbum yang masuk ke dalam tubuh sebanyak 4 hingga 5 kali ganda lebih banyak berbanding dewasa
- 2) Kanak-kanak minum, memakan dan bernafas dengan kadar yang lebih besar dalam unit kg berat badan berbanding orang dewasa seyogia, kadar pengambilan bahan plumbun dari udara, air dan makanan adalah lebih berbanding orang dewasa secara relatif.
- 3) Sawar darah- otak (*blood brain barrier*) yang membataskan kemasukan zat terlarut dari darah ke dalam cairan ekstraselular sistem saraf pusat yang mengandungi neuron masih berkembang di dalam kanak-kanak. Dengan itu, plumbum lebih mudah masuk ke sistem saraf pusat pada kanak-kanak.
- 4) Kelakuan sewaktu kanak-kanak membawa mereka kepada lebih terdedah dengan plumbum. Perbuatan seperti suka bermain di luar rumah, memasukkan barang ke dalam mulut dan makan tanah adalah menjadi contoh kepada dedahan sedemikian yang tidak dilakukan orang dewasa. Selain itu, kanak-kanak lebih mudah terhadu habuk plumbum kerana kedudukan saluran pernafasan mereka adalah lebih dekat kepada paras lantai atau paras bumi, di mana plumbum boleh didapati, berbanding orang dewasa.



Dari mana plumbum boleh didapati?

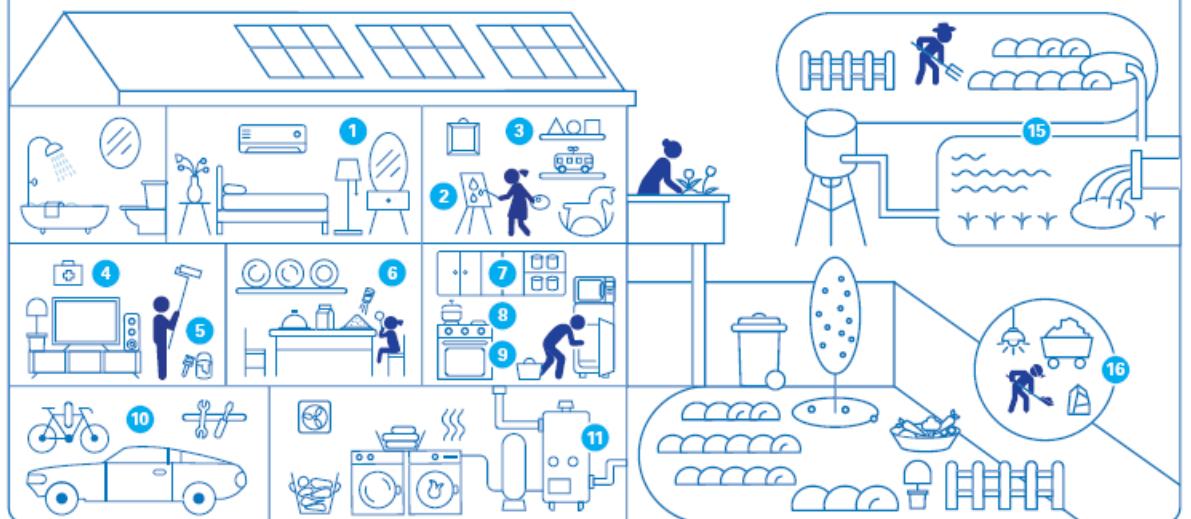
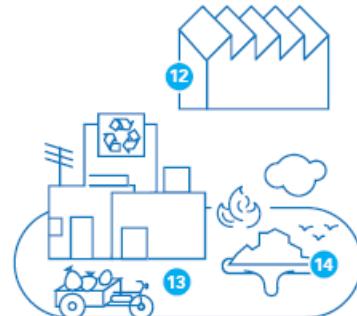
Jawapan: Plumbum yang boleh memasuki tubuh kanak-kanak boleh didapati dari

- 1) Air yang melalui saluran paip yang mengandungi plumbum
- 2) Pigmen dan cat berdasarkan plumbum
- 3) Perlombongan plumbum
- 4) Kosmetik dan ubat-ubatan tidak berdaftar
- 5) Bateri dan proses kitar semula bateri
- 6) Barang permainan yang mengandungi plumbum
- 7) Petrol yang mengandungi plumbum (Untuk Malaysia, petrol berplumbum tidak lagi digunakan pada tahun 1998)



Figure 7 Where Lead Can be Found

1. Some traditional cosmetics
2. Lead-based paints and pigments
3. Some toys and jewellery
4. Certain herbal, traditional and ayurvedic medicines
5. Dust and chips from peeling, cracking lead-based paint
6. Certain spices and candies
7. Some solders in food cans
8. Lead-based ceramic glazes on dishes and cooking pots
9. Some metallic cookware
10. Leaded gasoline
11. Lead water pipes and fixtures
12. Contaminated industrial sites
13. Unsound ULAB recycling sites
14. Emissions from waste incinerators
15. Contaminated soil where children play and food is grown
16. Family members with occupational exposure who bring lead dust home on clothes and shoes

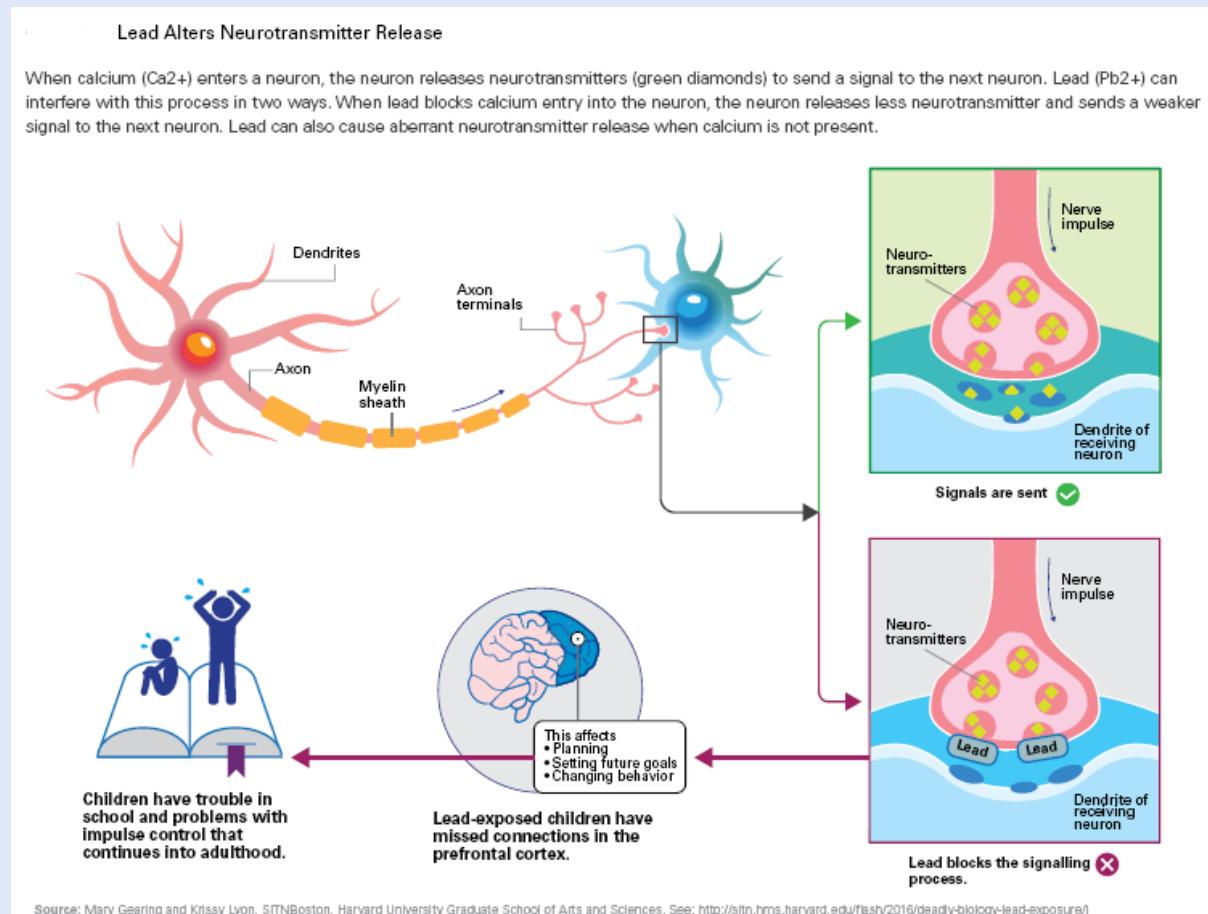


Sumber: UNICEF

Bagaimana Plumbum boleh memberi kesan buruk kepada kesihatan kanak-kanak?

Jawapan: Bagi kanak-kanak, tiada paras selamat untuk pendedahan kepada plumbum telah ditetapkan. Bermakna, sepatutnya tiada plumbum boleh dibenarkan masuk ke tubuh kanak-

kanak tersebut. Plumbum boleh menyebabkan kerosakan sistem saraf pusat kanak-kanak membawa kepada gangguan penyusunan neuron semasa perkembangan di otak. Ini akan menyebabkan kelembaban perkembangan otak, masalah pembelajaran, masalah tingkah laku dan masalah pendengaran dan pertuturan yang juga memberi kesan kepada fungsi linguistik. Mekanisma bagaimana plumbum bertindak memberi kesan kepada sistem saraf adalah dengan mengganggu sistem pelepasan *neurotransmitter* yang menggunakan ion kalsium.



Sumber: UNICEF

Tanda-tanda yang boleh dilihat pada kanak-kanak yang mempunyai kesan terhadap dedahan plumbum adalah: tahap IQ yang rendah, kekurangan kebolehan menumpukan perhatian untuk belajar dan pencapaian yang teruk di sekolah. Dalam kes-kes keracunan plumbum pada kanak-kanak, tanda-tanda dan gejala yang dapat dilihat pada bayi yang dilahirkan itu adalah seperti di Jadual 1. Dalam pada itu, menurut Wright *et al.*, terdapat pula hubungan antara paras plumbum dalam darah pada zaman kanak-kanak dengan kelakuan keganasan jenayah individu tersebut pada awal umur dewasa. Semakin tinggi paras plumbum dalam darah semasa kanak-kanak, semakin bertambah bilangan tangkapan pihak berkuasa atas kesalahan jenayah keganasan yang dilaporkan.

Jadual 1: Tanda-tanda dan gejala keracunan plumbum di kalangan kanak-kanak

Sistem Organ	Tanda dan gejala	
Umum	-lembap	-kelesuan
Mulut	-pertuturan tidak jelas -aktiviti memakan bahan bukan makanan	-garis biru pada gusi

Telinga	-masalah pendengaran	-masalah keseimbangan badan
Kulit	-pucat	
Neuromuskular	-sawan -hilang kodordinasi	-koma -kelemahan
Gastrousus	-hilang selera -anemia -loya dan muntah -kolik	-hilang berat badan -sakit abdomen -cirit birit atau sembelit
Sistem saraf pusat	-sakit kepala -masalah pembelajaran -keagresifan -cemerkap -kantuk	-kelewatan perkembangan -masalah tingkahlaku -irritabiliti -agitasi psikomotor -hiperaktif

Apakah yang boleh dilakukan bagi mengelak berlakunya keracunan plumbum kepada kanak-kanak?

Jawapan: Antara langkah-langkah yang boleh dilakukan untuk mengelakkan keracunan plumbum adalah:

Menentukan jika ada risiko kehadiran plumbum di persekitaran rumah dan sekitar komuniti di mana kanak-kanak tinggal. Ini termasuklah kawasan sekolah atau jika ada perusahaan kecil-kecilan kitar semula bateri yang mengandungi plumbum di kawasan tempat tinggal. Cat rumah atau bangunan yang menggelupas mungkin juga mengandungi plumbum dan perlu dibersihkan bagi mengelakkan kanak-kanak memasukkan cebisan tersebut ke dalam mulut.

Selain itu, penggunaan tenaga kerja buruh di kalangan kanak-kanak perlu dihadkan. Dalam beberapa negara membangun, kanak-kanak telah dilibatkan dalam perusahaan kitar semula bateri yang mengandungi plumbum. Dedahan sebegini boleh menyebabkan dos plumbum yang masuk ke badan kanak-kanak pada tahap yang tinggi.

Sekiranya persekitaran yang mempunyai pencemaran plumbum diketahui ada di komuniti, kanak-kanak perlu dipastikan tidak memasuki kawasan berkenaan. Ini termasuk bengkel kitar semula bateri berplumbum dan kawasan tanah tercemar. Bagi kawasan tanah tercemar yang mana adalah mustahil untuk mencegah kanak-kanak memasukinya, ia perlu ditutup dengan kepingan tanah berumput bagi mengelak habuk atau debu tanah tercemar tersebut dihidu kanak-kanak atau termakan.

Kanak-kanak dan ibu bapa atau penjaga harus mempraktikkan amalan kebersihan diri yang baik. Bagi kanak-kanak, pembasuhan tangan dan muka adalah perlu setelah bermain di luar rumah terutama dalam komuniti yang telah ada pencemaran plumbum di persekitaran mereka. Alat mainan yang digunakan juga perlu dibasuh dengan kerap. Bagi Ibu bapa atau penjaga, terutama yang bekerja dalam perusahaan kitar semula bateri, amalan mandi dan menukar pakaian sebelum pulang dari kerja juga akan memastikan sebarang pencemaran tempat kerja tidak dibawa pulang ke rumah dan memasuki tubuh badan anak-anak mereka.



Memastikan kanak-kanak mendapat makanan yang sihat dan seimbang. Nutrien seperti zat besi, kalsium dan vitamin C boleh membantu mengurangkan penyerapan plumbum ke dalam tubuh kanak-kanak. Kajian ada menunjukkan bahawa kanak-kanak yang lebih sihat adalah kurang mengalami kesan keracunan plumbum berbanding mereka yang mengalami malnutrisi.

Ibu bapa dan komuniti secara keseluruhan juga perlu mendapat pendidikan dan maklumat berkenaan produk-produk yang mengandungi plumbum dan mengelakkan penggunaannya. Penggunaan ubatan tradisional atau kosmetik tidak berdaftar boleh menyebabkan pendedahan plumbum kepada kepada kanak-kanak di dalam keluarga. Advokasi dari agensi kerajaan dan bukan kerajaan boleh membantu dalam mendidik masyarakat mengelakkan produk-produk sedemikian.

Kanak-kanak yang disyaki mendapat keracunan plumbum perlu mendapat rawatan perubatan dengan segera. Ujian darah perlu dilakukan bagi memastikan diagnosis yang sebenar. Rawatan sedia ada seperti rawatan "*chelation*" yang boleh mengikat ion plumbum dalam darah dan menyingkirkannya dari tubuh kanak-kanak melalui ginjal boleh diberikan namun, dalam keadaan keracunan plumbum yang teruk dan lama, ia mungkin kurang berkesan. Ini kerana pada keadaan diagnosis dilakukan pada peringkat yang lewat, plumbum tersebut mungkin telah tersimpan di dalam tulang kanak-kanak dan kerosakan pada saraf dan perkembangan kanak-kanak telah menjadi kekal.

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