Health problems due to industrialization & Occupational Health services

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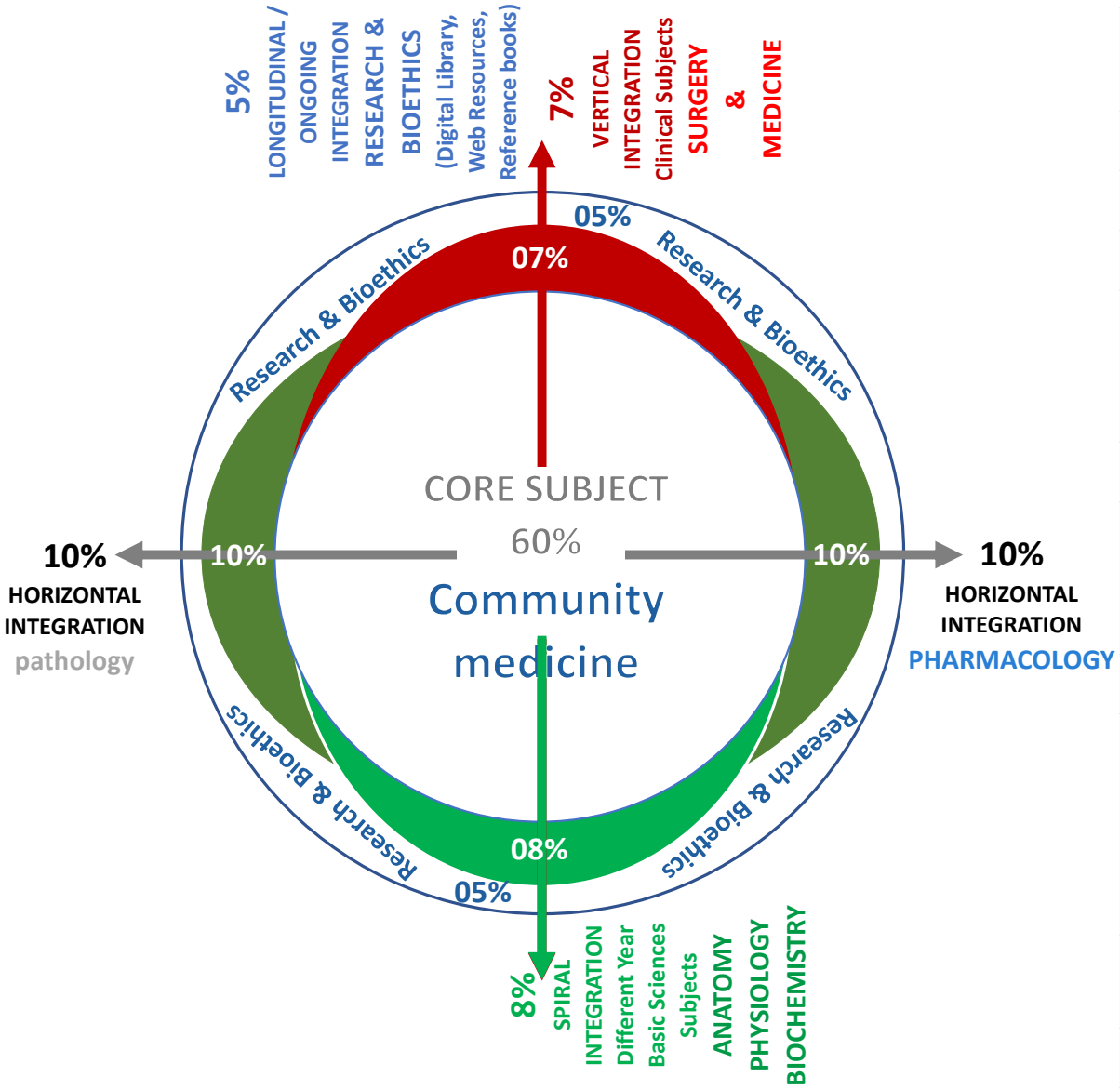
Vision & Mission of RMU

Vision

Highly recognized and accredited center of excellence in Medical Education, using evidence-based training techniques for development of highly competent health professionals, who are lifelong experiential learner and are socially accountable.

Mission Statement

To impart evidence-based research-oriented health professional education in order to provide best possible patient care and inculcate the values of mutual respect, ethical practice of healthcare and social accountability.



4th Year community medicine LGIS (≈30 slides)	
Core Subject – 60% (≈ 18-20 slides)	
Community medicine (≈ 18-20 slides)	
Horizontal Integration – 20% (≈ 5-6 slides)	
Same Year Subjects	• Pharmacology (10%) (≈ 2-3 slides) • Pathology (10%) (≈ 2-3 slides)
Vertical Integration – 07% (≈ 2-3 slides)	
Clinical Subjects	• Medicine (3-5%) (≈ 1-2 slides) • Surgery (3-5%) (≈ 1-2 slides)
Spiral Integration – 08% (≈ 2-3 slides)	
Different Year Basic Sciences Subjects	• Anatomy (1-3%) (≈ 1-2 slides) • Physiology (1-3%) (≈ 1-2 slides) • Biochemistry (1-3%) (≈ 1-2 slides)
Longitudinal / Ongoing Integration – 05% (≈ 1-2 slides)	
Research & Bioethics (≈ 1-2 slides)	

Learning Outcomes

	At the end of the session students will be able to,
Explain	"Lead-Poisoning", its common features, investigation & prevention
Illustrate	common causes & prevention of sickness absenteeism
Discuss	Functions of occupational health services
Comprehend	sources of different occupational cancers & common occupational hazards in agricultural workers
Appraise	Health problems due to industrialization

Sequence of Lecture	Learning Objectives (1 slide)
	Core Subject +vertical integration + horizontal (18 slides) (05) (02)
	Research (1 slide)
	Bioethics +artificial intelligence (1 slide) (1 slide)
	End of lecture assessment (1 slide)

Core Concept

Lead Poisoning (Plumbism)

Most frequent & toxic metal exposures to industrial workers

Properties:

- Highly soluble
- Anticorrosive
- Easily oxidized

Body storage:

- Normal body store: 150-400 mg
- Average blood level 25 microg/100ml
- Clinical symptoms appear: >70 mg/100ml (lead poisoning)
- Normal daily ingestion 0.2-0.3 mg/day (food, drinks etc)

Lead exposures

- **Industrial Exposures:**
  - storage batteries, glass, pottery, rubber, ship building & printing works.
- **Non-occupational exposures:**
  - automobile exhaust , lead-water pipes, chewing pencils, paint, toys in children
- **Mode of Exposures:**
  - fume Inhalation (fume industries)
  - ingestion (contaminated hands, water)
  - Skin (organic compounds only)

vertical Integration

Clinical Aspects Of Lead Poisoning

Toxic effects of **inorganic lead** exposures:	• abdominal colic, constipation, loss of appetite, **blue line on gums**, wrist drop, foot drop
Toxic effects of **organic lead** exposures**:**	• Insomnia, headache, mental confusion
Diagnosis:	• History of exposure, along with clinical signs & symptoms

horizontal Integration

Laboratory diagnosis of lead poisoning

Urine-Coproporphyrin >150µgm/L (also a useful Screening test), Amino levulenic acid >5mg/L

Basophilic stippling of RBCs is a sensitive indicator of lead poisoning.

Core concept & vertical Integration

Management & control Of Lead Poisoning

Management:

- Saline purge
- Use of d- penicillamine for chelation or Ca-EDTA
- Notify health authorities

Measures against industrial exposures to lead

- Substitution, Isolation
- Local exhaust ventilation
- Use of PPEs
- Good house keeping
- Working atmosphere: should be < 2.0mg / Cu m of air
- Periodic workers examination and screening
- Personal hygiene & Health education

Core Concept

Occupational hazards in agricultural workers

Zoonotic diseases

- brucellosis, anthrax, tetanus, bovine T.B.

accidents

- Increase use of agricultural machinery, insect & snake bite

Toxic hazards

- Fertilizers, insecticides, pesticides

Physical hazards

- Extremes of climatic conditions like temperature, humidity, solar radiation
- noise, vibration, inadequate ventilation

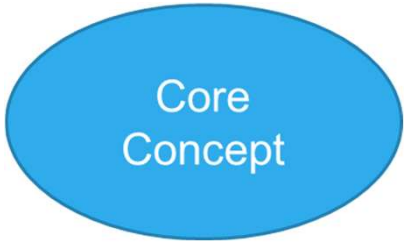
Respiratory diseases

- Byssinosis, bagassosis, farmers lung, asthma

Sickness Absenteeism

Core Concept

- **Causes:**
  - Economic
  - Social
  - Medical
  - Non occupational—drug addiction
- **Prevention:**
  - Good factory management
  - Adequate pre-placement medical examination
  - Good human relationships
  - Application of ergonomics



Health problems due to Industrialization

Community Health problem

Environmental sanitation problem

- Housing
- Water & air pollution
- Sewage disposal
- Sewage disposal

Communicable diseases—T.B., food or water borne infection, venereal diseases, filariasis

Food sanitation

Health problems due to Industrialization

Mental health

- Psychoneurosis, behavioral disorders

Accidents

- more in number due to increase tempo of life in addition to those that occur in factories

Social problems:

- Alcoholism, gambling, juvenile delinquency, more crimes

Morbidity & mortality:

- Increase incidence of chr. bronchitis, lung cancer in industrialized area as compared to rural area
- Similarly, more cases of infant mortality rate, crude death rate

Core Concept

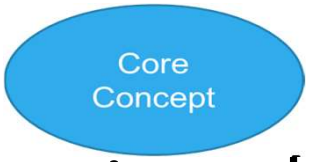
Functions of Occupational Health Service

- Placing people in suitable environment
- Maintaining people in suitable work
- Providing treatment
- Controlling recognized hazards
- Identifying un-recognized hazards
- Avoiding potential risks
- Early Screening of non-occupational diseases
- Health education & safety training
- Surveillance of sanitary, catering & welfare services
- Environmental control outside the workplace

Core Concept

Social Security Benefits

1. Occupational injury disablement is up-to 20% total encashment of gratuity.
2. In case of occupational injury during work in which disablement is up-to 20% provision of disablement pension.
3. In case of death due to occupational injury payment of pension equal to his pay to his family.
4. In case of unmarried worker pension will be paid to his/her parents or brothers/sisters.
5. Medical benefits for the dependents of the pensioner, handicapped worker and of diseased worker.



Laws/regulations related to occupational health and safety-Pakistan

- Factories Act 1934
- Factories Rules (Sind & Punjab)-1978
- Hazardous Occupations Rules 1963
- Mines Act 1923
- West Pakistan Shops and Establishments Ordinance, 1969
- Provincial Employees Social Security Ordinance, 1965
- Workmen’s Compensation Act-1923
- West Pakistan Commercial Establishments (Standing Orders) Ordinance 1968
- Dock Laborer's Act 1934

Justice—an Ethical Principle & Occupational Health

- justice is directed toward treating employees fairly, equally, and without discrimination.
- providing equal opportunity for disabled persons related to job availability and promotion,
- assuring that individuals are not discriminated against because of a health condition, when they are able to perform the job.

Artificial Intelligence in the Future of Work

- Computer vision has been shown to be useful in:
  - monitoring safety compliance
  - tracking workers in a particular area
  - examining safety conditions on a particular job site.
  - improve training and assist in reducing the impact of hazards in the workplace
  - process and analyze human language

https://blogs.cdc.gov/niosh-science-blog/2021/05/24/ai-future-of-work/

End Of Lecture Assessment (EOLA)

A painter aged 40 years presented with a 6-week history of malaise, abdominal cramps, nausea and mild mental impairment. He had previously been using a sander to remove paint. Although he had respirator, he did not wear it when other workmen were sanding on the same floor. Investigation by the patient's general practitioner showed a blood lead of 4.18 µmol l^{-1}

- What is the most probable diagnosis.

- What preventive measures should be suggested by the family physician for the condition.

Suggested readings

- Parks Textbook of Preventive and Social Medicine. 23rd ed. Occupational health