NATIONAL UNIVERSITY OF PHARMACY
DEPARTMENT OF PATHOLOGICAL PHYSIOLOGY

HYGIENE IN PHARMACY AND ECOLOGY

Topic

“HYGIENE OF LABER”

Kharkiv, 2017/18

Plan of lecture

1. Occupational hazards, classification.
2. Noise as a harmful production factor in pharmaceutical premises.
3. Occupational diseases in the pharmaceutical industry.
4. Preventive measures.

Suggested Reading

Basic

- Hygiene in Pharmacy. Manual for foreign students of higher schools / O. S. Kalyuzhnaya, O. P. Strilets, L. S. Strelnikov et al. – 2nd Edition, supplemented and revised. – Kharkiv: NUPh, 2013. – 224 p.
- Bardov V. G. Hygiene and Ecology/ Editer by V. G. Bardov. – Vinnytsya : Nova Knyha Publishers, 2009. – 687 p.

Auxiliary

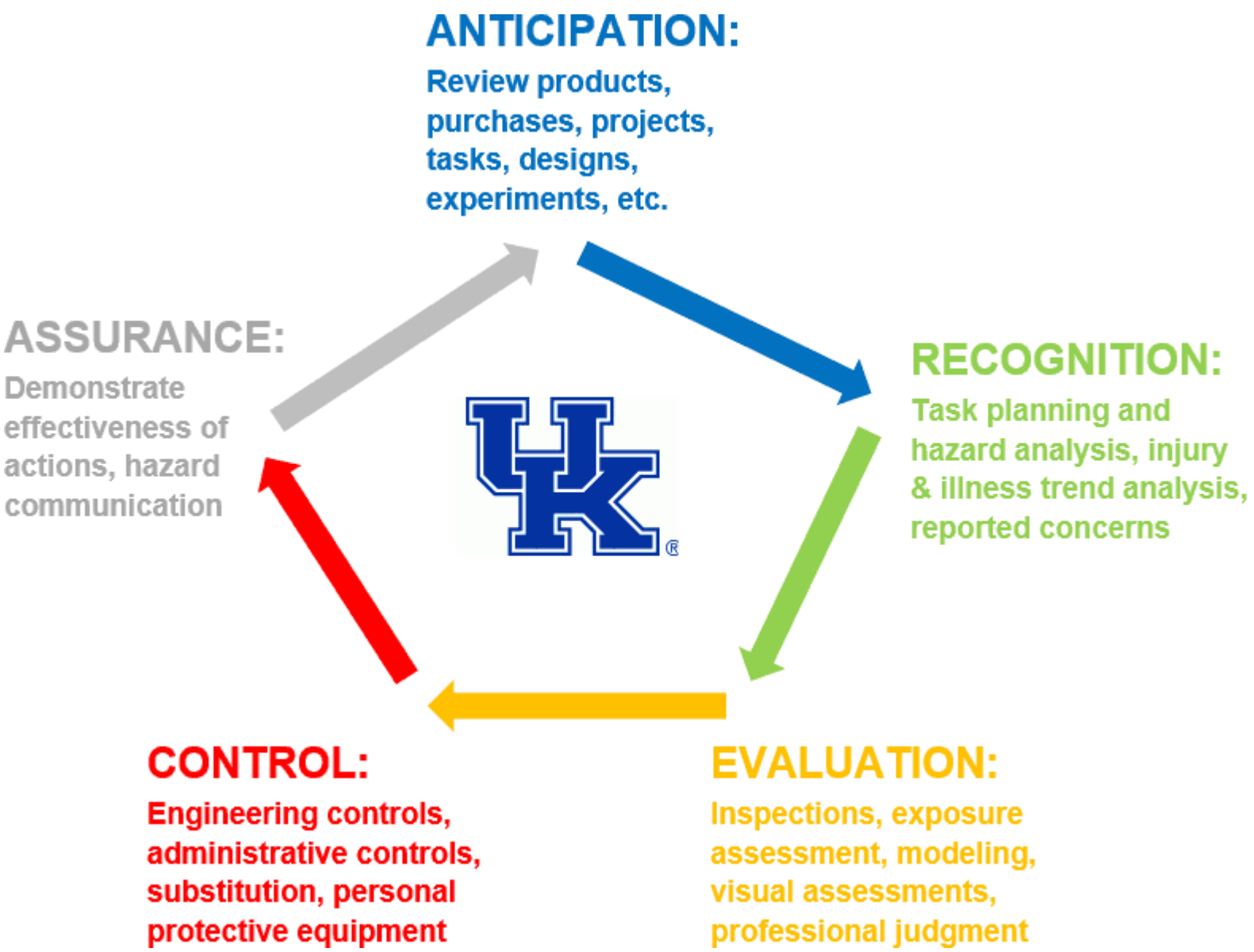
- Kjellstrom Y. Basic environmental health / Y. Kjellstrom, K. Guidotti. – Oxford. – 2001. – 546 p.
- General Hygiene and environmental health / Zaporozhan V. M., Bazhora Yu. I., Vitenko I. S. et al. – Odessa, 2005. – 300 p.

Information resources, including the Internet

- Library of NPhaU: http://lib.nuph.edu.ua
- Specialized medical and biological portals of the Internet.

Occupational Hygiene

(United States: Industrial Hygiene (IH))
is the anticipation, recognition, evaluation, control and prevention of hazards from work that may result in injury, illness, or affect the well being of workers.


ANTICIPATION:
Review products, purchases, projects, tasks, designs, experiments, etc.
RECOGNITION:
Task planning and hazard analysis, injury & illness trend analysis, reported concerns
EVALUATION:
Inspections, exposure assessment, modeling, visual assessments, professional judgment
CONTROL:
Engineering controls, administrative controls, substitution, personal protective equipment
ASSURANCE:
Demonstrate effectiveness of actions, hazard communication

OCCUPATIONAL HYGIENE STUDIES

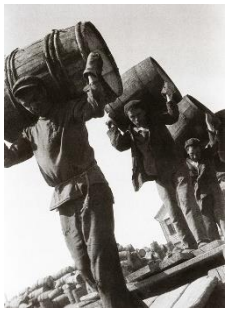
- LABOUR ACTIVITY OF PEOPLE
- WORKING CONDITIONS OF PEOPLE
- INFLUENCE OF PRODUCTION FACTORS ON THE ORGANISM
- PREVENTIVE MEASURES

LABOUR ACTIVITY OF PEOPLE

Forms of labor:

- physical labor

(dynamic and static)



- mechanized form of work

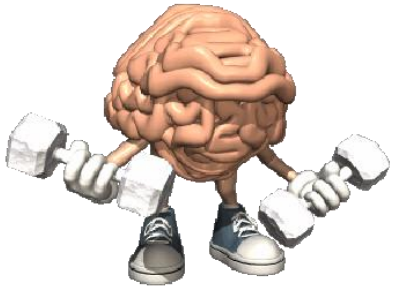
- automated and semi-automated work

- conveyor

- intellectual work

Classification of work

- By severity of work
  - easy
  - medium gravity
  - heavy
  - very heavy
- By tension of work
  - tense
  - little tense
  - tense
  - very tense



The influence of labor on a person's physiological condition

- Fatigue – a condition characterized by a lessened capacity for work and reduced efficiency of accomplishment, usually accompanied by a feeling of weariness and tiredness.

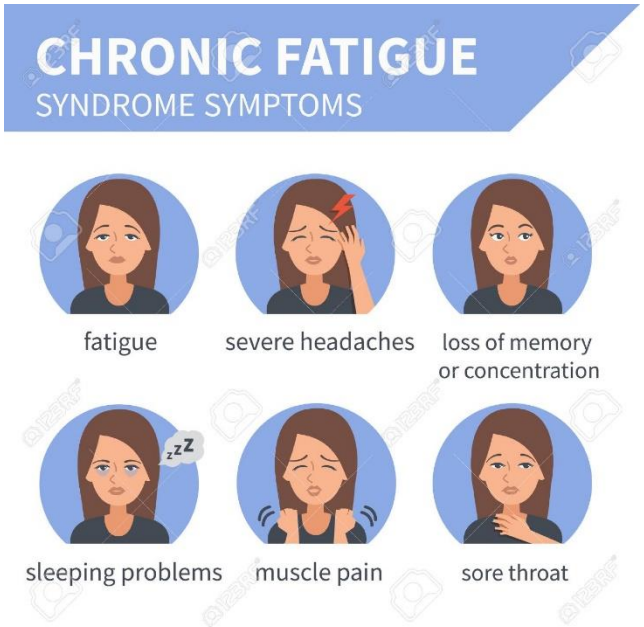
FATIGUE

physical

mental

Signs of Fatigue

- doing work slowly with errors
- disturbance of coordination of movements
- sleepiness and headache
- irritability and nervousness



The influence of labor on a person's physiological condition

- Overwork – is the highest degree of fatigue, a discrepancy between spent energy and recovery processes

Signs of overwork

- disturbance of cardiac rhythm and blood pressure
- loss of appetite
- irritability
- unreasonable fears
- insomnia
- illness state

WORKING CONDITIONS ARE A SET OF WORKING ENVIRONMENT FACTORS, LABOUR PROCESS, THAT INFLUENCE ON HEALTH AND WORKING ACTIVITY OF A PERSON IN THE PROCESS OF PROFESSIONAL ACTIVITY

WORKING CONDITIONS ARE SUBDIVIDED INTO 4 CLASSES:

I – OPTIMAL – ARE NOT HARMFUL FOR HEALTH, WORKING CONDITIONS ALLOW TO MAINTAIN HIGH LEVEL OF CAPACITY FOR WORK.

II – PERMISSIBLE – LEVELS OF WORKING ENVIRONMENT AGENTS DO NOT EXCEED ESTABLISHED HIGIENIC RULES, AND CHANGES OF FUNCTIONAL BODY CONSTITUTION ARE REESTABLISHED

III – HARMFUL – HARMFUL INDUSTRIAL FACTORS EXCEED HIGIENIC GUIDELINES AND CAN HAZARDOUSLY INFLUENCE ON HEALTH

IV – HAZARDOUS (EXTREME) – INFLUENCE OF THESE FACTORS CAUSES HIGH RISKS OF SERIOUS DISEASE GROWTH.

CLASSIFICATION OF HAZARDOUS AND HARMFUL PRODUCTION FACTORS

1. PSYCOPHYSIOLOGICAL
2. PHYSICAL
3. CHEMICAL
4. BIOLOGICAL
5. HAZARDS OF EMPLOYMENT INJURIES

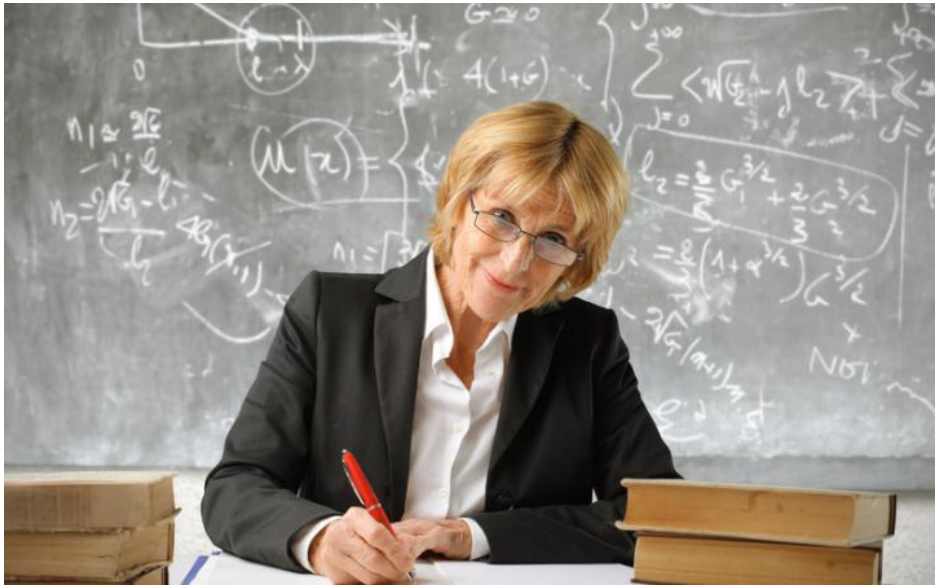
PSYCOPHYSIOLOGICAL FACTORS

1. PHYSICAL OVERLOAD OF MUSCULOSCELETAL SYSTEM:
- LIFTING AND TRANSFERRING OF WEIGHT
- UNCOMFORTABLE BODY POSITION
- PRESSURE ON SKIN, JOINTS, MUSCLES AND BONES

2. PHYSIOLOGICALLY INSUFFICIENT PHYSICAL ACTIVITY

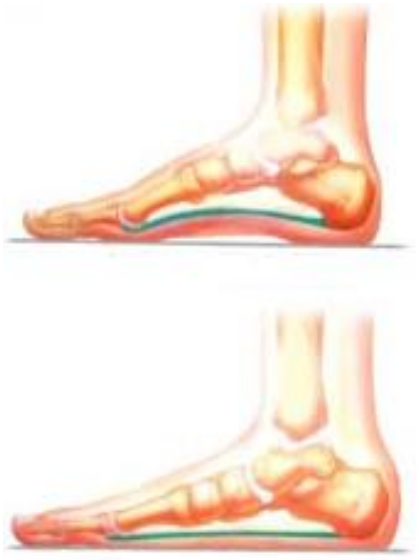
3. PHYSIOLOGICAL OVERLOADS OF CIRCULATORY AND RESPIRATORY ORGANS

4. PSYCHICAL OVERLOADS – MENTAL AND EMOTIONAL STATES.



The Pharmacist is standing a long time during the shift.

As result the flat foot, pain in the legs, muscular fatigue, venouse inflammation, thrombophlebitis develop.



IN THE WORKS THERE IS MUSCLE TENSION WHEN MONOTONY AND SMALL MOVEMENTS ARE PERFORMED (WEIGHING, PACKING, MEASUREMENT OF LIQUID). THIS CAN LEAD TO MYOSITIS.

PHYSICAL FACTORS

1. RISE OR FALL IN TEMPERATURE, HUMIDITY AND SPEED OF AIR MOVEMENT

2. INCREASED LEVEL OF ULTRASOUNDE

3. INCREASED LEVEL OF RADIATION

4. INCREASED LEVEL OF NOISE, VIBRATION

5. INSUFFICIENT OR IRRATIONAL ILLUMINATION OF WORKING AREA

6. HIGH OR LOW ATMOSPHERIC PRESSURE

CHEMICAL FACTORS

GASES, FLUIDS, AEROSOLS, THAT HAVE ALLERGIC, CARCINOGENIC AND MUTAGENIC ACTIONS

BIOLOGICAL FACTORS

1. MICRO-, AND MACROORGANISMS, SOURCES OF INFECTION, INVASIONS

2. VITAMINS, HORMONES, ANTIBIOTICS

INFLUENCE OF MEDICINES AND CHEMICAL AGENTS

chemical and biological substance intake into the organism through skin, respiratory system, mucous membranes

AIR IN THE ASSISTANT ROOM IS POLLUTED WITH

- **DUST**
- **SULFANAMIDES,**
- **ANTIBIOTICS,**
- **DIPHENHYDRAMINE HYDROCHLORIDE,**
- **ANTIPYRETICS,**
- **PAPAVERINE HYDROCHLORIDE,**
- **NICOTINIC ACID,**
- **VITAMINS**

HIGH CONCENTRATIONS OF DUST CAN BE FOUND IN MATERIAL AND ASSISTANT ROOMS – IN THE PROCESS OF MEDICINES AND MIXTURE PREPARATION.

PACKING OF MEDICINAL HERBS, PREPARATION OF HERBAL REMEDIES ARE ESPECIALLY HAZARDOUS.

DUST OF MEDICINESIS IS A SPECIFIC MANUFACTURING FACTOR for

PHARMACISTS-TECHNOLOGISTS,

PHARMACISTS,

ANALYTICS.

PREVENTIVE MEASURES

- **LOCATION OF THE PREMISES:**
- **INTERPOSITION**
- **ABSENCE OF POLLUTED AIR PENETRATION**
- **LOCATION FAR AWAY FROM WASHING, PACKAGING, AND ASSISTANT ROOMS**
- **ADMINISTRATIVE OFFICES MUST BE ISOLATED FROM MANUFACTURING ROOMS.**

- **SANITARY AND TECHNICAL MEANS:**

CONDITIONING SYSTEM, ILLUMINATION, HOT AND COLD WATER SUPPLY, RATIONAL SYSTEM OF VENTILATION.

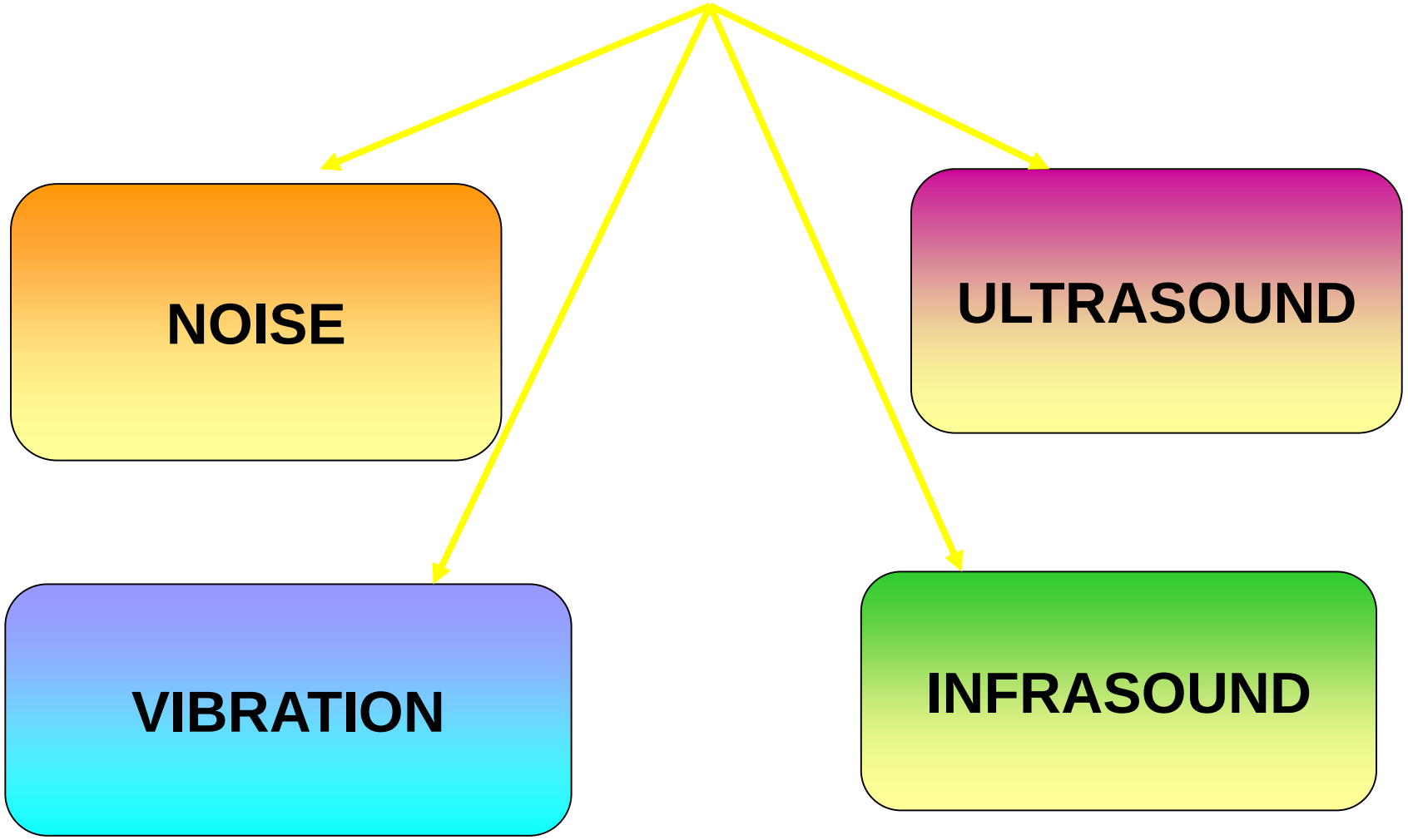
- **USING OF SMALL-SCALE MECHANIZATION FOR LIQUID PACKING, THEIR FILTRATION, RIDDLING, RUBBING, AND OTHERS.**

THIS ALLOWS TO MINIMIZE THE INGRESS OF DUST ON SKIN, MUCOUS MEMBRANES OF AIRWAY.

- **USING PERSONAL PROTECTION MEANS FOR RESPIRATORY SYSTEM AND SKIN.**

- **PERSONAL HIGIENE.**

HAZARDOUS FACTORS OF PRODUCTION ENVIRONMENT



NOISE **IS MECHANICAL OSCILLATION OF ELASTIC MEDIUM (GASEOUS, LIQUID OR SOLID) PARTICLES THAT SPREAD WITH THE FREQUENCY FROM 20 TO 20 000 OSCILLATIONS PER SECOND (HZ).**

Source of noise – OSCILLATING BODY

PHYSICAL CHARACTERISTICS OF NOISE

SOUND PRESSURE

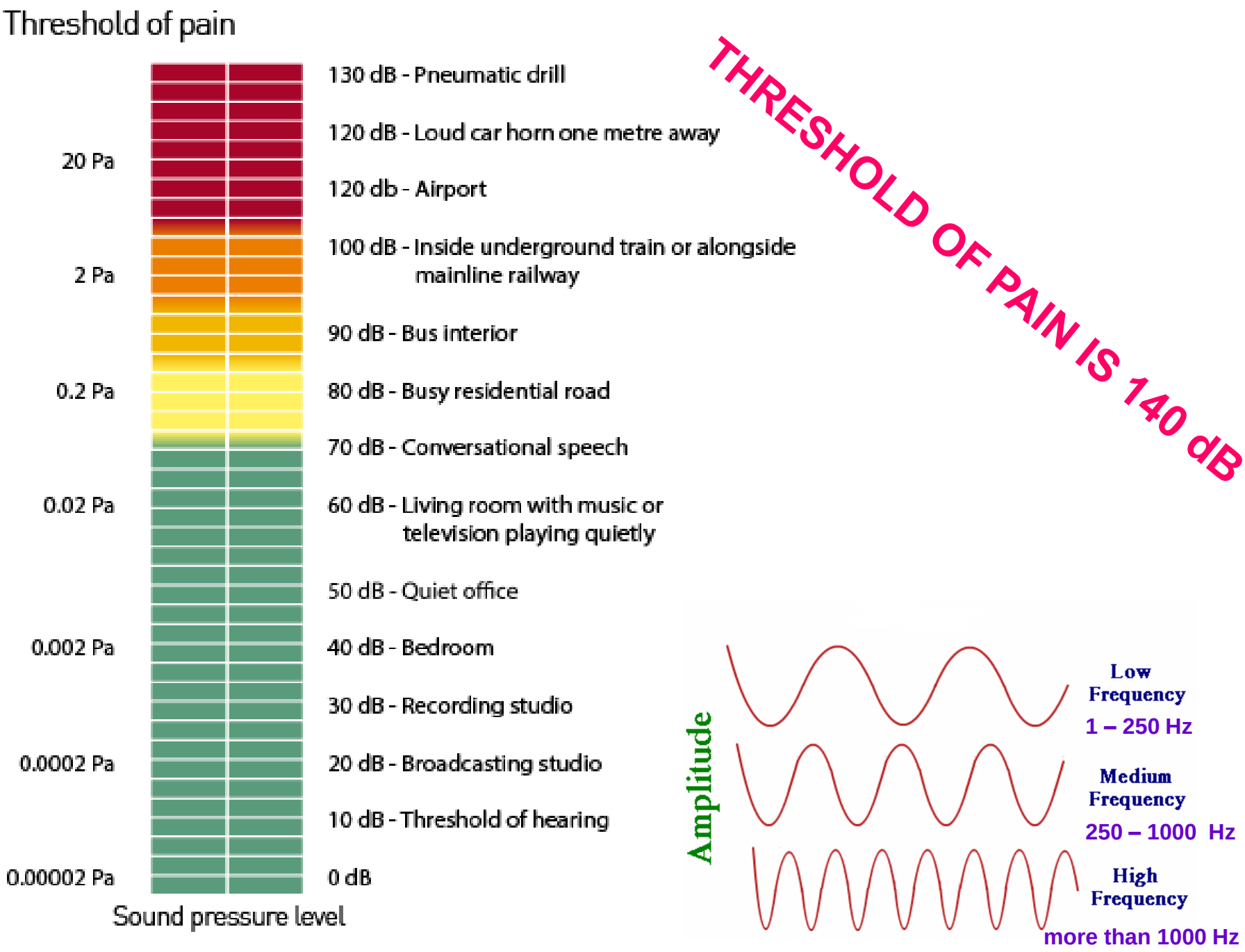
P, [Pa]

SOUND INTENSITY

J, [W/м^2]

FREQUENCY

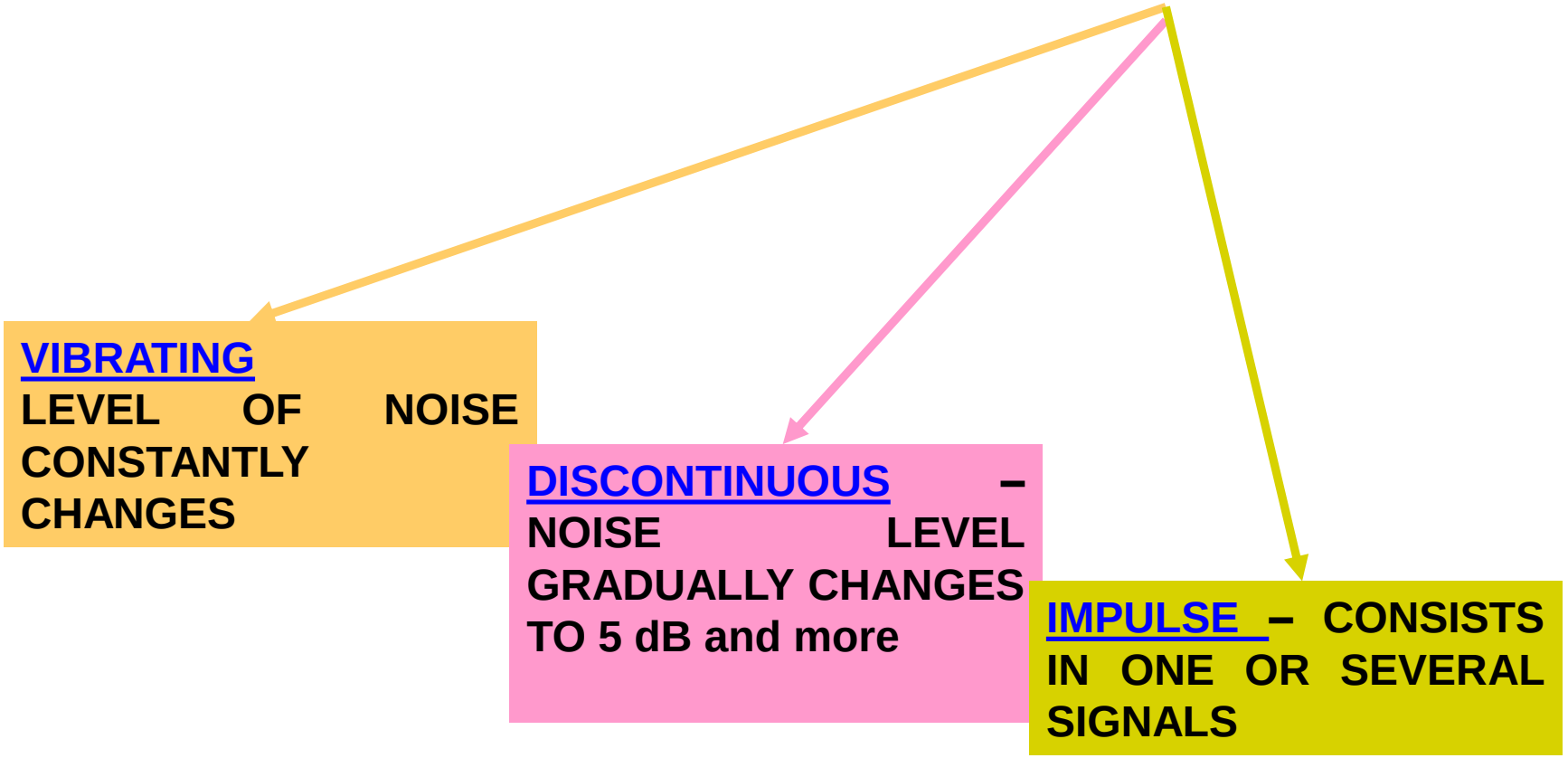
f, [Hz]


Threshold of pain
130 dB - Pneumatic drill
120 dB - Loud car horn one metre away
20 Pa
120 db - Airport
100 dB - Inside underground train or alongside mainline railway
2 Pa
90 dB - Bus interior
0.2 Pa
80 dB - Busy residential road
70 dB - Conversational speech
0.02 Pa
60 dB - Living room with music or television playing quietly
50 dB - Quiet office
0.002 Pa
40 dB - Bedroom
30 dB - Recording studio
0.0002 Pa
20 dB - Broadcasting studio
10 dB - Threshold of hearing
0.00002 Pa
0 dB
Sound pressure level
THRESHOLD OF PAIN IS 140 dB
Amplitude
Low Frequency
1 – 250 Hz
Medium Frequency
250 – 1000 Hz
High Frequency
more than 1000 Hz

FOR TIME CHARACTERISTICS

CONSTANT NOISE
SOUND LEVEL CHANGES
NOT MORE THAN TO 5 dB

UNSTEADY NOISE
SOUND LEVEL CHANGES
MORE THAN TO 5 dB



VIBRATING
LEVEL OF NOISE CONSTANTLY CHANGES

DISCONTINUOUS – NOISE LEVEL GRADUALLY CHANGES TO 5 dB and more

IMPULSE – CONSISTS IN ONE OR SEVERAL SIGNALS

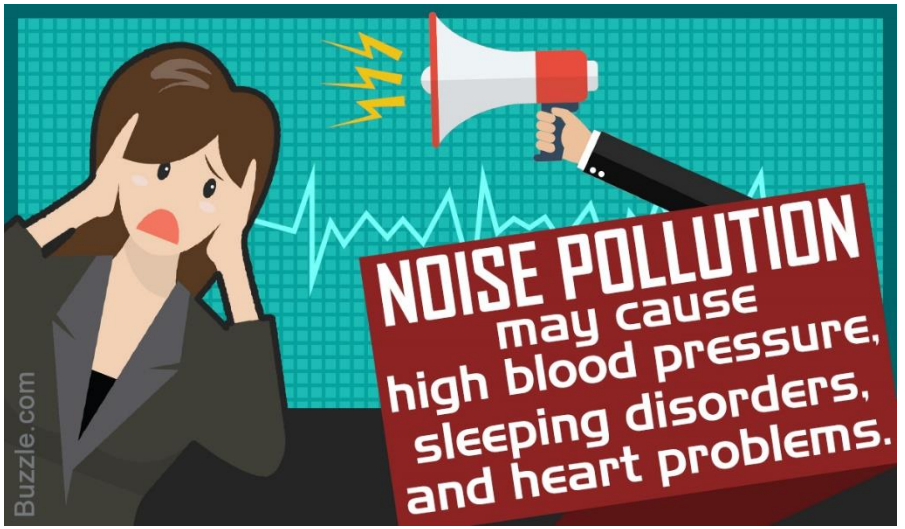
NOISE INFLUENCE ON THE HUMAN ORGANISM

SPECIFIC ACTION

DIRECT INFLUENCE ON ORGANS OF HEARING

NONSPECIFIC ACTION

INDIRECT ACTION VIA EXCITATION OF SIGNALS IN NERVE CELLS



FOR PHARMACIES IT IS RECOMMENDED TO ESTABLISH NOISE LEVEL NOT MORE THAN 30 dB, MORE INTENSIVE NOISE LEADS TO INCREASE OF ERRORS WHILE PREPARING DRUGS.


THANK YOU
FOR YOUR
ATTENTION