

WORKING AND HEALTH

LECTURE FOR MEDICAL STUDENTS

https://is.muni.cz/www/2422/um



WORK IS ENNOBLIG

- TO BE EMPLOYED HELPS TO FIND THE CREDIT WITHIN THE SOCIETY
- UNEMPLOYMENT IS ASSOCIATED WITH:
- POVERTY,
- DEPRIVATION, PASSIVITY
- BARRENNESS



HEALTH CONSEQUENCES

- WORSE LIFESTYLE (MALNUTRITION, ALCOHOLISM, SMOKING, DRUGS ABUSE, POOR HYGIENE)
- PSYCHOSOMATIC DISEASES
- PSYCHIATRIC MORBIDITY



SOCIAL CONSEQUENCES

- MISSING OF WORK HABITS
- INTOLERANCE TO FOREIGNS
- DISCRIMINATION OF OLDER PEOPLE
- SOCIAL FRUSTRATIONS
- DEMONSTRATIONS
- ARM CONFLICTS,
- WARS



- EVERYBODY MADE EVERYTHINK
- HAND-MADE SPECIALIZATIONS
- FIRST MACHINES
- MECHANIZATION
- AUTOMATIZATION
- ROBOTIZATION



- DYNAMIC/ENERGETIC LOAD DECREASED
- STATIC LOAD INCREASED
- SEDENTARY POSITIONS
- MONOTONY WITH NARROW
 MUSCULOSCELETAL PARTS OVERLOAD



Changes - continue

- GROWING DEMAND FOR:
- SENSES ABILITIES (espec. Vision)
- MENTAL ACTIVITY (qualification, attention, responsibility)



- ERGONOMIC APPROACH:
- DETAIL KNOWLEDGE ABOUT HUMAN ANATOMY, PHYSIOLOGY, PSYCHOLOGY

ADAPTATION OF WORKING
 ENVIRONMENT TO HUMAN CAPABILITY

EXAMPLES:

- ERGONOMIC CHAIRS
- HANDLE HAFT
- CONTROL EQUIPMENTS
- INFORMATIVE EQUIPMENTS
- WORKING ENVIRONMENT (microclimate, lighting)
- ARRAGEMENT OF WORKPLACE



IN DENTAL OFFICES:

- POSITION "FACE-TO-FACE" resp.
 BEHIND THE PATIENT 'S HEAD
- UNIT FOR "RIGHT-HAND" and "LEFT-HAND" PREFERENTION (mirror construction)

ENVIFORM

- ERGONOMIC SIMULATING SYSTEM = METHOD FOR THE ASSESSMENT OF POOR ERGONOMY:
- VIRTUAL WORKING PLACES
- ANALYSIS OF WORK PROCESSES
- ANALYSIS OF AVAILABILITY, VISIBILITY, BODY LOAD, ENERGY LOST



WORK AS A HEALTH RISK

- OCCUPATIONAL D.:
- MAINLY AMONG
 WORKERS
- CAUSE SPECIFIC
- OCCUPATIONAL EXPOSURE IS ESSENTIAL

- WORK-RELATED D.:
- LARGELY IN THE POPULATION
- MULTIFACTORIAL
- OCCUPATIONAL EXPOSURE MAY BE A FACTOR



THE SOCIAL APPROACH

- OCCUPATIONAL D.:
- NOTIFABLE
- COMPENSABLE

- WORK-RELATED D.:
- MAY BE NOTIFABLE
- MAY BE
 COMPENSABLE



- FACTORS:
- MECHANICAL

- HEAVY PHYSICAL LOAD

- OUTCOMES:
- ACCIDENTS,
 INJURIES
- MUSCULOSCELETAL
 DISORDERS,
 INJURIES, LOW
 BACK PAIN



- ERGONOMIC
- Non-physiologic position

- MONOTONY
- Quick rate of movement

- MUSCULOSCELETAL DISORDERS (D. FROM REPEATED OVERLOAD)
- MENTAL STRESS, LOWERED QUALITY AND PRODUCTIVITY
- D.FROM REPEATED OVERLOAD



PHYSICAL HAZARDS

NOISE

- VIBRATION
- RADIATION
- EXTREMEMICROCLIMATE

- HEARING LOSS
- PSYCHOSOMATIC D.
- TR.VASONEUROSIS
- CANCER, RADIAT.D.
- CATARACT
- CVD,HYPERTHERM.
- CHILBLAINS



CHEMICAL HAZARDS

- DUSTS
- Different compounds
- PNEUMOCONIOSIS
- SILICOSIS
- ASBESTOSIS
- BERRYLIOSIS
- SIDEROSIS

CHEMICAL HAZARDS



WIDE SPECTRUM OF HUNDREDS COMPOUNDS

- INJURIES, IRRITATION
- TOXICANTS
- CARCINOGENS
- ALERGENS
- TERRATOGENS



BIOLOGIC HAZARDS

ANIMALS

 MICROBIAL AND VIRAL FACTORS

PLANT ALLERGENS

- INJURIES,
- ANTROPOZOONOS.
- INFECTIONS
- ALLERGIES

ALLERGIES



PSYCHOLOGICAL STRAIN

- DIFFERENT STRESS FACTORS
- NEUROSIS
- DEPRESSION
- DISSATISFACTION
- CONFLICTS
- PSYCHOSOMATIC D.



WORK FACTORS AND WORK-RELATED D.

- BEHAVIORAL AND PSYCHOSOMATIC D.
- HYPERTENSION

- WORK OVERLOAD
- WORK UNDERLOAD
- SHIFT WORK
- CAREER DEVELOP.
- MIGRATION
- INTERPERSONAL CONFLICTS
- RESPONSIBILITY



OCCUPATIONAL DISEASES

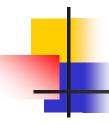
- ARE
 CHARACTERIZED BY
 SOME SPECIFIC
 MARKERS
- AND NEED SOME SPECIFIC DIAGNOSTIC METHODS



- TEETH ABBRASSION: MOLARS (dust).
 INCISIVES (musical wind instruments)
- MORE FREQUENT CARRIES (org.dust)
- GREY GUM's MARGIN (Pb)
- SLAVER (Hg, organophosphates)
- BLEEDING (benzene)



 IN HEALTH PROFESSIONAL PRACTICE ARE WIDE AND COMMON



- INFECTIOUS AGENS
- X-RAY
- INJURY
- POSTURAL STRESS
- NOISE, VIBRATION



- CHEMICALS:
- ORGANIC SOLVENTS
- CHEMICAL CARCINOGENS AND TERRATOGENS (CHEMOTHERAPY, ANESTESIOLOGY)
- ANORGANIC MERCURY



- ALLERGENS:
- PROCAIN, MESOCAIN
- IODINE, FAMOSEPT, FORMALDEHYDE
- SULFONAMIDES
- ANTIBIOTICS
- ACRYLATES, LATEX/RUBBER



OCCUPATIONAL STRESS

- sy. OF OVERFILL WAITING-ROOM
- LACK OF DRUGS
- LACK OF DIAGNOSTIC METHODS
- ADMINISTRATIVE OVERLOAD
- PATIENT'S MOOD
- PATIENT'S RELATIVES
- INTERPERSONAL RELATIONSHIPS
- SHIFT-WORK

4

OUTCOMES OF STRESS

- "BURN OUT" sy.
- PSYCHOSOMATIC DISEASES
- ALCOHOLISM, SMOKING, DRUGS
- PSYCHIATRIC DISORDERS SUICIDES
 RR 2,0 (Finland, UK) 4,0 (USA)



NANO-PARTICLES — A NEW HAZARDS?

- COMPOUNDS OF DIFFERENT CHEMICALS
- AT LEAST ONE DIAMETER IS UP TO 100 nm
- DIFFERENT PHYSICAL and CHEMICAL PROPERTIES

NANO-TECHNOLOGY IN HEALTH CARE

- SILVER-NANOPARTICLES=> BACTERIO STATIC PROPERTIES (surgery)
- NANO-ROBOTS: CARRIERS OF DRUGS (chemotherapy)
- IN TOOTH PASTE => QUICK REPLACEMENT OF MICROSCOPIC DAMAGES OF TOOTH ENAMEL => PREVENTION OF CARRIES

WHAT WE KNOW?

- HIGH ABILITY TO MAKE CLUSTERS WITH DIAMETERS OF RESPIRABLE DUST (1 – 5 um)
- INCREASED TRENDS TO WIDE USING
- NANO-SILVER: ANTIBACTERIAL PROPERTIES => DRESSING
- TARGET TRANSPORT OF DRUGS



WHAT WE DO NOT KNOW?

- TO MEASURE THE LEVEL OF EXPOSURE
- THE INFLUENCE OF NANOPARTICLES
 ON HUMAN HEALTH
- EVEN THE EXPERIMENTAL STUDIES
 GIVE INADEQUATE INFORMATIONS

WORLD CENTERS OF RESEARCH

- USA
- South Korea
- EU

SYSTEM OF PRELIMINARY CAUTION



CARE ABOUT WORKERS

- AT RISK WORKPLACES:
- 1) PRIMARY PREVENTION
- 2) SECONDARY PREVENTION
- 3) DUTIES FOR EMPOYERS, PHYSICIANS, WORKERS



PRIMARY PREVENTION

- CONTROL OF NEW HAZARDS
- CONTROL OF KNOWN HAZARDS
- SUBSTITUTION OF RISK FACTORS
- TECHNICAL CONTROLS TO MINIMASE EXPOSURE
- ADMINISTRATIVE CONTROLS



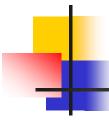
PRIMARY PREVENTION

- ENVIRONMENTAL MONITORING
- BIOLOGICAL MONITORING OF EXPOSURE
- IDENTIFICATION OF VULNERABLE PERSONS (pre-employed examination)
- PERSONAL PROTECTIVE DEVICES



PRIMARY PREVENTION

- SMOKING REDUCTION/CESSATION
- ALCOHOL APPROPRIATTE AMOUNT, ONLY IN THE PRIVACY
- EXERCISE AND FITNESS
- NUTRITION IN WORKPLACE CANTEENS, IN VENDING MACHINES



SECONDARY PREVENTION

- SCREENING = EARLY DETECTION OF DELETERIOUS EFFECTS
- PERIODIC MEDICAL EXAMINATIONS
- TESTs OF CHEMICAL EXPOSURE:
- -measurement of chemical/metabolite
- -measurement of conjugates
- -measurement of body reactions



RESPONSIBILITY IN PREVENTION

- EMPLOYERs: (masters, bosses)
- INFORMATION ABOUT RISKS
- CONTROL FOR REDUCTION OF EXPOSURE
- CONTRACT WITH PHYSICIANS
- PROTECTIVE DEVICES



PHYSICIANS:

- INFORMATION ABOUT HEALTH RISKS OF OCCUPATIONAL HAZARDS
- EXCLUDING THE VULNERABLE PERSONS
- PERIODIC MEDICAL EXAMINATIONS + COLLABORATION WITH SPECIALISTS
- PROPOSALS FOR WORKERS PROTECTION



RESPONSIBILITY IN PREVENTION

- WORKERS:
- ACCEPT THE INFORMATION AND ADVICES FOR SAFETY WORK
- USE THE PROTECTIVE DEVICES
- ABSOLVE PREVENTIVE MEDICAL EXAMINATIONS



RULES IN CZECH REPUBLIC

- HAZARDOUS WORKPLACES ARE STATUTED BY REGIONAL HYGIENIST
- LIMITS/NORMS ARE STATUTED BY GENERAL HYGIENIST
- OCCUPATIONAL DISEASES ARE DIAGNOSED BY SPECIALISTS IN REGIONAL OFFICES

MERCURY

- ELEMENTARY FORM (termometers, instruments)
- SUBLIMATION UNDER THE ROOM TEMPERATURE => LUNG DAMAGES (even lethal)
- SPECIAL RULES FOR CLEANING
- CHANGES BY ANOTHER SYSTEM



MERCURY ORGANIC

- NATURAL CONTAMINATION of FOOD CHAINS (Minamata D.)
- POISONING BY GRAIN (seed for sowing) covered by Hg INSECTICIDES
 => contamination of FOOD CHAINS (Iraque)
- BAN of use ORGANIC Hg as PESTICIDE

MERCURY

- ANORGANIC AMALGAM
- RISK FOR DENTISTS (drilling, brushing)
- RISK FOR PATIENTS (inspiration of aerosol => enhanced blood levels

AMALGAM

- Cca 90 TONNES IS USED ANNUALLY WITHIN EU
- DENTAL USING REPRESENTS ABOUT
 50 % OF DAILY INTAKE (ADI = 20 ug,
 + 22 ug from amalgam)
- RISK FOR ENVIRONMENT (cremation)
- CONTINUAL DECREASING



HEALTH OUCOMES

- INTERSTITIAL PNEUMONIA
- PSYCHIATRIC DISORDERS (mad hatter)
- TREMOR, MOOVING DISORDERS
- PERIPHERAL NEUROPATHY
- RENAL INSUFICIENCY
- PARALYSIS OF LIFE CENTERS



TERRATOGENIC EFFECTS

- MENTAL / NEUROLOGICAL DISTURBANCES
- DAMAGES of RENAL FUNCTIONS
- HOW TO TREAT CARRIES DURING PREGNANCY?

CONCLUSSION:

- ALL FORMS OF MERCURY ARE HARMFUL
- POOR ELIMINATION FROM THE EXPOSED BODY
- THE RISK IS BIG
- STRONG CONTROL IS A PRIORITY