**LECTURE SYLLABUS**

**(Dental medicine)**

**Etiological factors**

**Intrinsic etiological factors**

**Heredity**

Hereditary diseases – heredity + potentially other factors

New mutations

Somatic mutations → e.g. tumorigenesis

**Mutations**

Point mutations

- Substitution

- Deletion

- Insertion

- In-frame

- Frame shift

Chromosomal aberations

**Result of a mutation**

* neutral mutation
* amorphic or hypomorphic
* hypermorphic
* antimorphic
* neomorphic

Penetrance

Expressivity

Heritability

Haplosufficiency, haploinsufficiency

Loss of heterozygosity

**Hereditary diseases**

Autosomal - dominant

- recessive

- semidominant

- codominant

Gonosomal - X-linked

- Y-linked = holandric type of heredity

Mitochondrial

Polygenic inheritance

**Chromosomal disorders**

Chromosomal instability

* Fragile X chromosome sy., Chromosome instability sy.
* Structural abnormalities of autosomes
* Translocations
* Cry du chat syndrome – deletion of short arms chromosome 5

Numerical abnormalities of autosomes

* Trisomy 21 (Down’s syndrome)
* Trisomy 18 (Edwards syndrome)
* Trisomy 13 (Patau syndrome)

Sex chromosomal disorders

* Klinefelter syndrome (47, XXY)
* Turner syndrome (45, X0)
* Super female (47, XXX)
* Super male (47, XYY)

**Epigenetics**

**Age**

**Sex**

**Extrinsic etiological factors**

**Physical factors**

Mechanical influences – injuries, type of wounds, healing and its disturbance

Electrical current

- Alternating, direct, mechanisms of effect, electrical current injuries, principles of safety

Thermal effects

- General and local (including general response of the organism) impact of cold and heat

- Burns

- Frostbites

- Chilblains

- Hypothermia

- Insolation

- Hyperthermia

Environmental (atmospheric) pressure and its changes

- Adaptation on the higher altitude

- Altitude disease

- Barotrauma

- Decompression illness

- Hyperbaric oxygenotherapy

Radiation – ionizing and non-ionizing

- Classification of radiation, effect of different kinds of radiation on the organism and its mechanisms, diagnostic and therapeutic properties

- Radiation illness

- Laser

Noise, infrasound, ultrasound (diagnostic and therapeutic properties)

Kinetosis

**Chemical factors**

Toxins

Site of entrance, mechanisms of effect, toxicity quantification, elimination of toxins, manifestation of intoxication

Examples of important toxic substances and their influence:

- Heavy metals

- Arsenic

- Cyanides

- Carbon monoxide

- Nitric and nitrous compounds

- Organophosphates

- Main plant and animal poisons

Corrosive substances and their effect

Teratogenic, mutagenic and cancerogenic substances

**Biological factors**

Animals, plants, fungi

Infections

* Classification:

- Prions

- Viruses

- Bacteria

- Molds

- Protozoa

- Multicellular parasites – worms, mites, insects

* Transfer mechanisms of infections and penetration of infectious agens into organism
* Mechanisms of pathological effect of microorganisms and multicellular parasites
* Examples of infectious diseases
* Coexistence of human organism with  microorganisms, examples of positive influence of microorganisms on the human

**Social factors**

Mutual influence and interaction of etiological factors