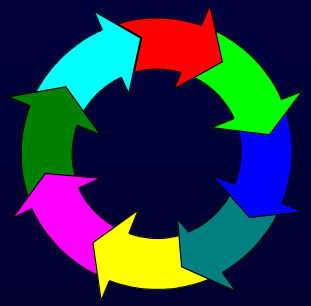
MOVEMENT DISORDERS

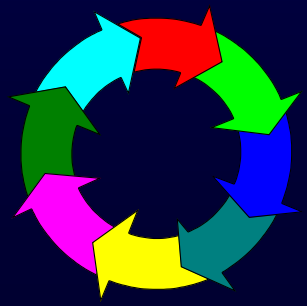


Parts of the motor circuits

- cortical centers: there are centers in all the cortical lobes
- subcortical centers:
- caudate nucleus
- putamen
- pallidum
- subthalamical nucleus (Luys)
- nucleus ruber
- substantia nigra

striatum

nucleus lentiformis

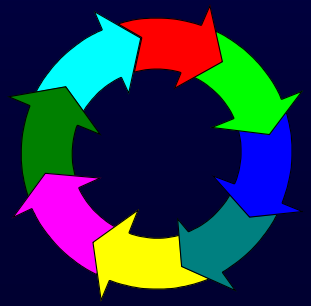


There are two main clinically different groups:

- **hypokinetic-hypertonic**

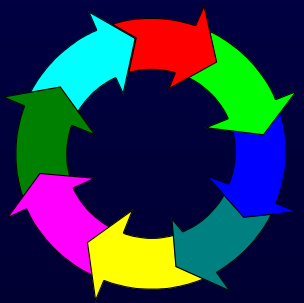
  (rigid)

- **hyperkinetic-hypotonic**



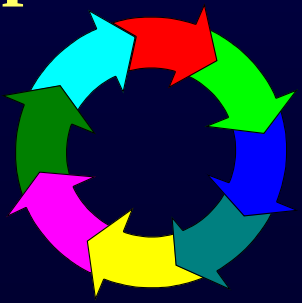
hypokinetic-hypertonic (rigid) syndrome

Parkinson’s disease, Parkinsonian syndromes



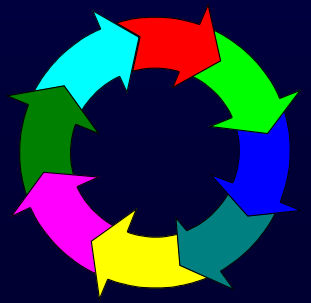
The etiology of the Parkinsonism

- **primer, idiopathic form: Parkinson's disease**
- **the second most frequent progressive neurodegenerative disease**
- **the prevalence is 1% in the 65 year old population and it increases to 4-5% in the 85 year old population**
- **it is most frequently sporadic**
- **approximately 10% of the cases are familiar (there are 16 indentified genes, wich cause autosomal dominant, or recessive forms of Parkinson's disease)**



The etiology of the Parkinsonian syndromes

- **symptomatic: Parkinson's syndrome**
  - **trauma**
  - **tumor**
  - **inflammation (encephalitis)**
  - **stroke (ischemic, hemorrhagic)**
  - **toxic agents (CO, neuroleptic drugs)**



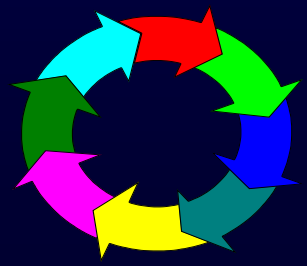
The etiology of the Parkinsonian syndromes

Parkinson plus diseases

- Synucleopathies:
  - Multi System Atrophy (MSA)
- Taupathies (abnormaly fosforilated Tau protein):
  - Progresive Supranuclear Palsy (PSP)=
  - Steel-Richardson-Olszewski sy.
  - Corticobasal Degeneration

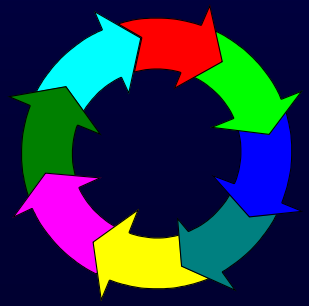
The neuropathologic basis of Parkinson's disease

- degeneration of the substantia nigra and the striatum (Lewy bodies- citoplasmatic protein aggregations)
- disintegration of the dopamin-acetilcholin balance in the central nervous system
- decrease of the dopamin level and cholinergic dominance



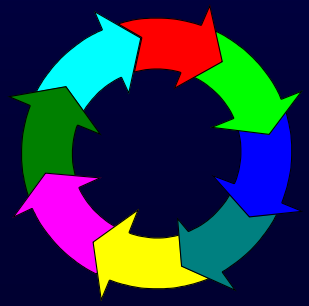
the main motor symptoms of Parkinsonism

- rigidity
- tremor
- hypo-, and bradykinesis
- postural instability



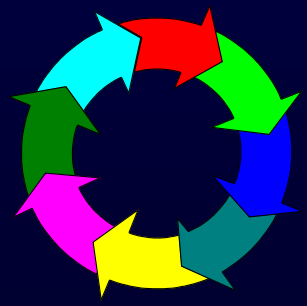
rigidity

- the tone of the agonist és antagonist (flexor and extensor) muscles increases paralelly
- the trunk and the extremities are in semiflected position
- during passive movement of the extremities we can feel permanent resistance (cogwheel phenomenon)
- very often assimetrical distribution



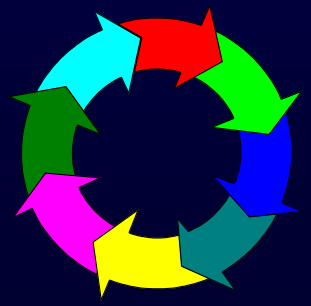
tremor

- the agonistic and antagonistic (flexor és extensor) muscles contract with rhytmic, 6-8/sec. frequency
- the tremor is most prominent in resting position, the stress could provoke it
- the intended movements decrease the tremor and it is stopped during sleep
- very often assimetrical distribution



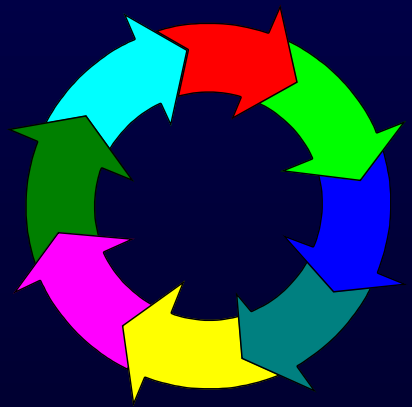
hypo-, and bradykinesis

- movements and walking become slow, sluggish and difficult
- shuffling gait with decreased excursion of legs
- difficulties in turning
- freezing: sudden stop in walking and movements



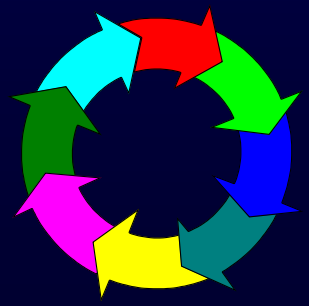
other signs (motor)

- on-off phenomenon
- retropulsion
- hypomimia, or blank face
- monotonous speech
- micrographia



other signs (non motor)

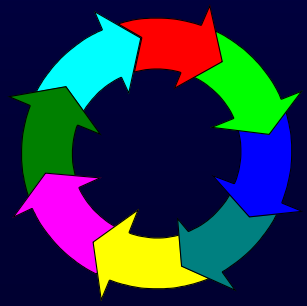
- hyposmia, hypogeusia
- vegetative problems: orthostatic hypotension, incontinence, impotence, hyperperspiration
- gastrointestinal problems :swallowing difficulty, hypersalivation, gastroparesis, constipation
- pain and other sensory disturbances
- depression
- sleep disorders



Parkinson plus diseases

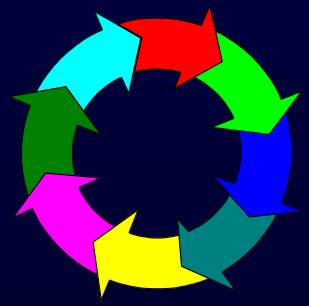
Multi System Atrophy (MSA) - Papp-Lantos disease

- the stages of the disease:
  - striato-nigral degeneration
  - olivo-ponto-cerebellar atrophy
  - Shy-Drager syndrome
- no, or mild asimmetricity in the parkinsonic signs
- early falls down
- autonomic dysfunctions (orthostatic hypotension, impotence, incontinence, respiratory stridor)
- „dropped head”
- pyramidal signs, cerebellar signs
- no, or just partial respons to levodopa therapy



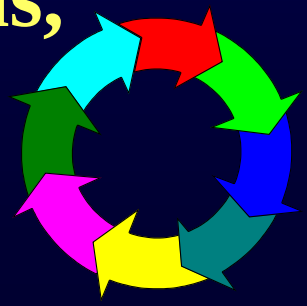
Parkinson plus diseases
Progresive Supranuclear Palsy (PSP)-
Steel-Richardson-Olszewski sy.

- **postural instability, early falls down, axial rigidity, freezing**
- **supranuclear gaze paresis (predominantly vertical) downwards gaze!**
- **frontal lobe signs (primitive reflexes, apathy, frontal demencia)**



the Parkinsonian crisis could be life threatening !!

- complete immobility
- aphagia and anarthria
- extreme rigidity
- fever
- cardiovascular inssufficiency
- bedsores, pneumonia, deep vein thrombosis, lung embolism



treatment

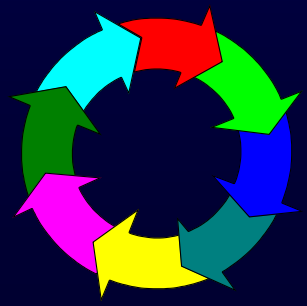
DRUGS

- **MAO B inhibitors (selegilin, rasagiline)**
- **Amantadin (PK Merz)**
- **Dopamin agonists (ergotamine type:bromocriptin,**
  non ergotamin type: ropinirole, pramipexole, rotigotine, apomorphine)
- **L-DOPA substitution (L-DOPA+DOPA decarboxilase inhibitor) per os and intrajejunal infusion DUODOPA**
- **COMT inhibitors (entacapone)**
- **L-DOPA+DOPA decarboxilase inhibitor+ COMT inhibitor**
- **anticholinergic drugs (metixene, procyclidine)**

treatment

SURGICAL (just in severe cases, when the antiparkinsonian drugs are uneffective)

- **deep brain stimulation – DBS (uni-, or bilateral)**
  target zones: STN, pallidum, thalamus VIM nucleus
- **thalamotomy, pallidotomy (uni-, or bilateral)**
- **neurotransplantation (inplantation of fetal mesencephalic cells into the caudat nucleus and putamen region)**



treatment

- physicotherapy (training, special exercises)
- psychotherapy