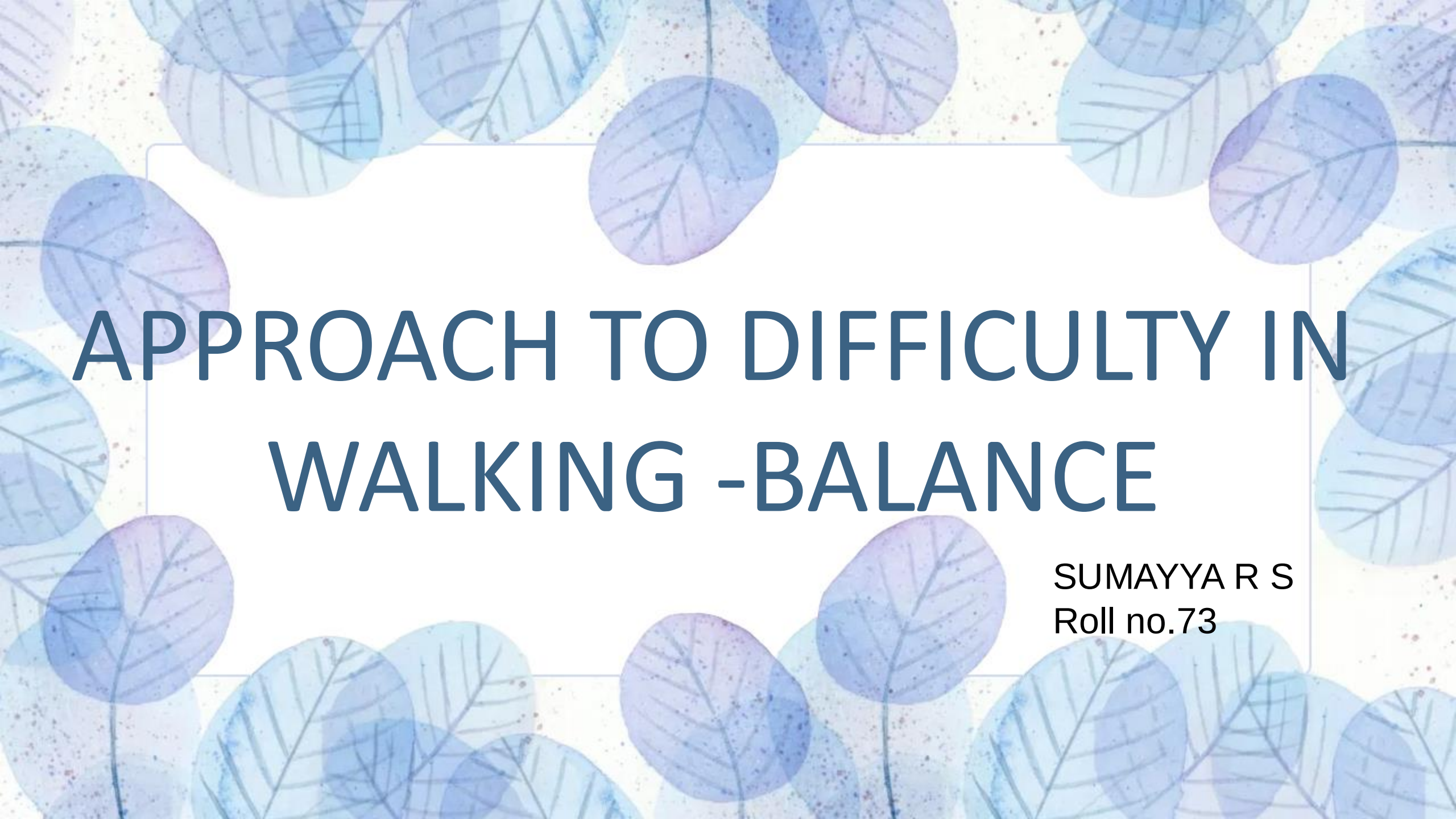




APPROACH TO DIFFICULTY IN WALKING -BALANCE

SUMAYYA R S
Roll no.73

Balance is the ability to maintain equilibrium in which one's center of mass is controlled with respect to the lower extremities, gravity, and the support surface despite external perturbations.

- Anatomic substrate for dynamic balance has not been well defined, but the vestibular nucleus and midline cerebellum contribute to balance control.
- Standing balance depends on good-quality sensory information about the position of the body center with respect to the environment, support surface, and gravitational forces.
- Sensory information for postural control is primarily generated by the visual system, the vestibular system, and proprioceptive receptors in the muscle spindles and joints.
- Loss of two of the three pathways is sufficient to compromise standing balance.

SYMPTOMS:

- Sense of motion or spinning (vertigo)
- Feeling of faintness or lightheadness (presyncope)
- Loss of balance or unsteadiness
- Falling or feeling like you might fall
- Dizziness
- Vision changes such as blurriness
- Confusion

CAUSES

Disorders of balance can arise from abnormalities affecting:

- Input: loss of vision, vestibular disorders or lack of joint position sense.
- Processing: damage to vestibular nuclei or cerebellum.
- Motor function: spinal cord lesions, leg weakness

❖ **VESTIBULAR PROBLEMS:**

Abnormalities in the inner ear causes a sensation of a floating or heavy head and unsteadiness in the dark.

Symptoms and signs:

- (1) vertigo (the subjective inappropriate perception or illusion of movement)
- (2) nystagmus (involuntary eye movements)
- (3) impaired standing balance

❖ **CEREBELLAR ATAXIA:**

Patients do not generally complain of dizziness, although balance is visibly impaired.

Neurologic examination reveals a variety of cerebellar signs. Postural compensation may prevent falls early , but falls are inevitable with disease progression.

❖ ***SOMATOSENSORY DEFICITS:***

Produce imbalance and falls. There is often a subjective sense of insecure balance and fear of falling. Postural control is compromised by eye closure (Romberg's sign); these patients also have difficulty navigating in the dark.

❖ ***PERIPHERAL NEUROPATHY:***

Nerve damage can lead to difficulties with walking.

❖ ***JOINT, MUSCLE OR VISION PROBLEMS***

Muscle weakness and unstable joints can contribute to the loss of balance. Difficulties with eyesight also can lead to unsteadiness.

❖ ***MEDICATIONS***

Loss of balance or unsteadiness can be a side effect of medications.

❖ ***CERTAIN NEUROLOGICAL CONDITIONS***

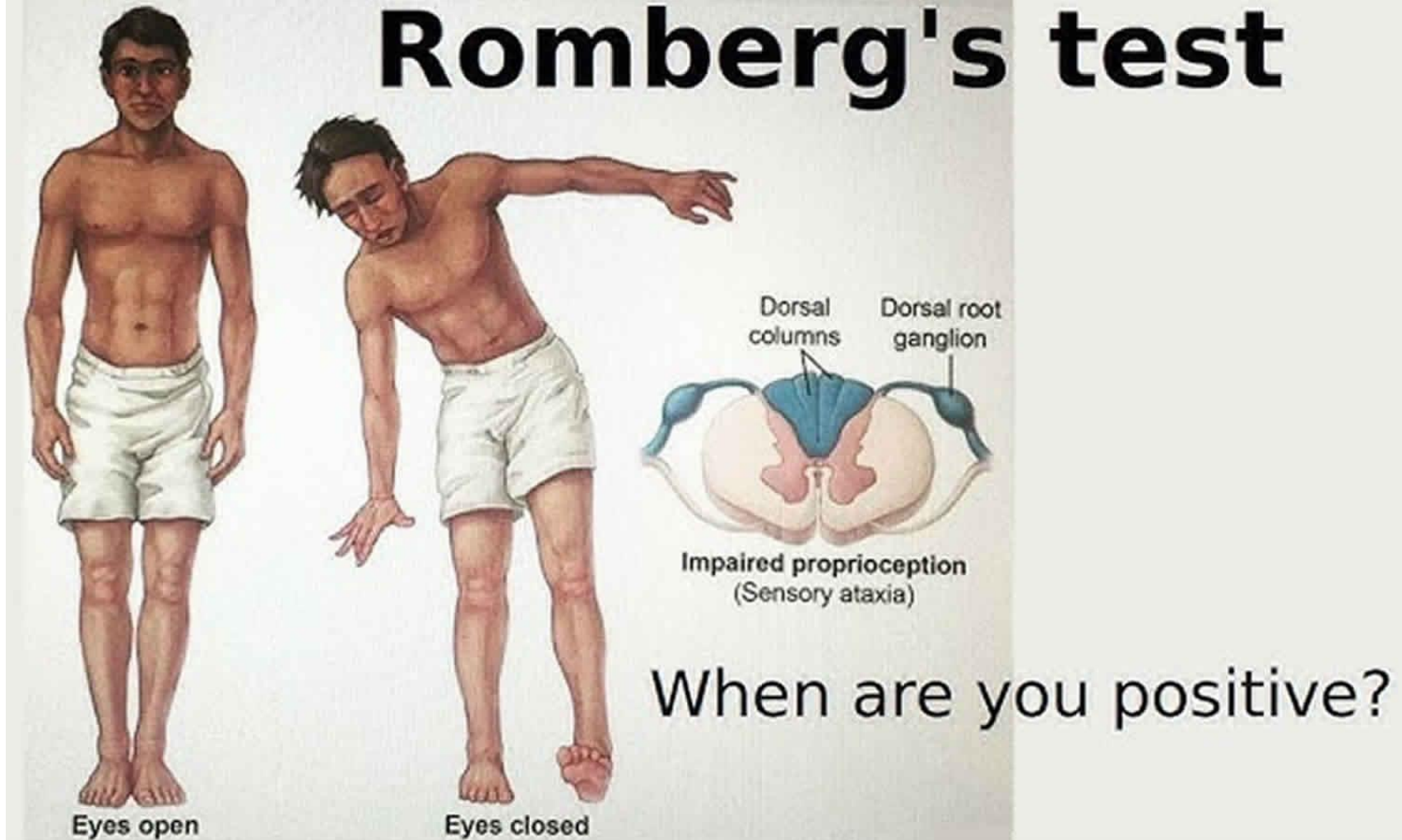
These include cervical spondylosis and Parkinson's disease.

CLINICAL ASSESSMENT OF BALANCE

- Examine the cranial nerves, particularly testing the eyes and for nystagmus to identify signs of vestibular or neurological disorders.
- **Romberg's test** – The patient stands with the feet together, initially with the eyes open and then closed.
 - Patients with disorders of the spinal posterior columns (impaired position sense) will sway or fall with closed eyes, but will stand normally if eyes are open.
 - Patients with uncompensated unilateral labyrinthine dysfunction are unstable, tending to fall to the side of the lesion

- Patients with central dysfunction sway to both sides, whether the eyes are open or shut.
- Patients with persistent postural perceptual dizziness(PPPD), a cause of chronic dizziness , will feel excessively unsteady on Romberg's test despite not exhibiting particularly pronounced sway.

Romberg's test



- **Unterberger's stepping test** – The patient standing with arms outstretched and eyes closed and taking steps on the spot.
- Unilateral vestibular hypofunction leads to rotation to the affected side.



- **Tandem gait** – The patient walks heel to toe with eyes first open and then closed.
- The patient with a cerebellar lesion is unable to do either (ataxic gait).
 - The patient with a peripheral vestibular lesion will struggle, particularly with eyes closed.



➤ Dix – Hallpike test

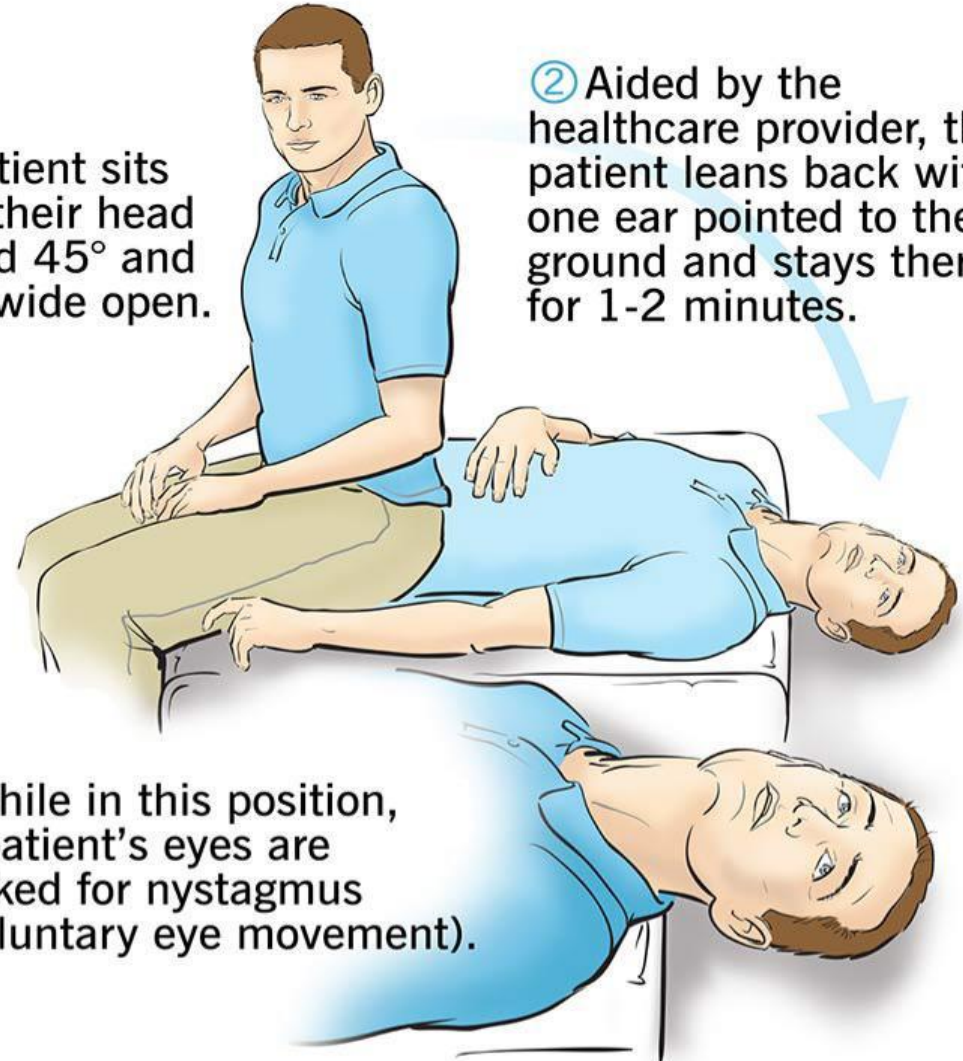
- To diagnose Benign Paroxysmal Positional vertigo (BPPV).
- The condition is caused by debris in the posterior semicircular canal.

Dix-Hallpike Maneuver

① Patient sits with their head turned 45° and eyes wide open.

② Aided by the healthcare provider, the patient leans back with one ear pointed to the ground and stays there for 1-2 minutes.

③ While in this position, the patient's eyes are checked for nystagmus (involuntary eye movement).



REFERENCE

- HUTCHISON'S CLINICAL METHODS – 25TH EDITION
- DAVIDSON'S ESSENTIALS OF MEDICINE – 2ND EDITION
- HARRISON'S PRINCIPLE OF INTERNAL MEDICINE-21ST EDITION

A decorative border of watercolor-style leaves in various shades of blue and purple, arranged around the perimeter of the slide. The leaves have detailed vein patterns and a soft, painterly texture. A thin, light blue rectangular line frames the central text area.

THANK YOU