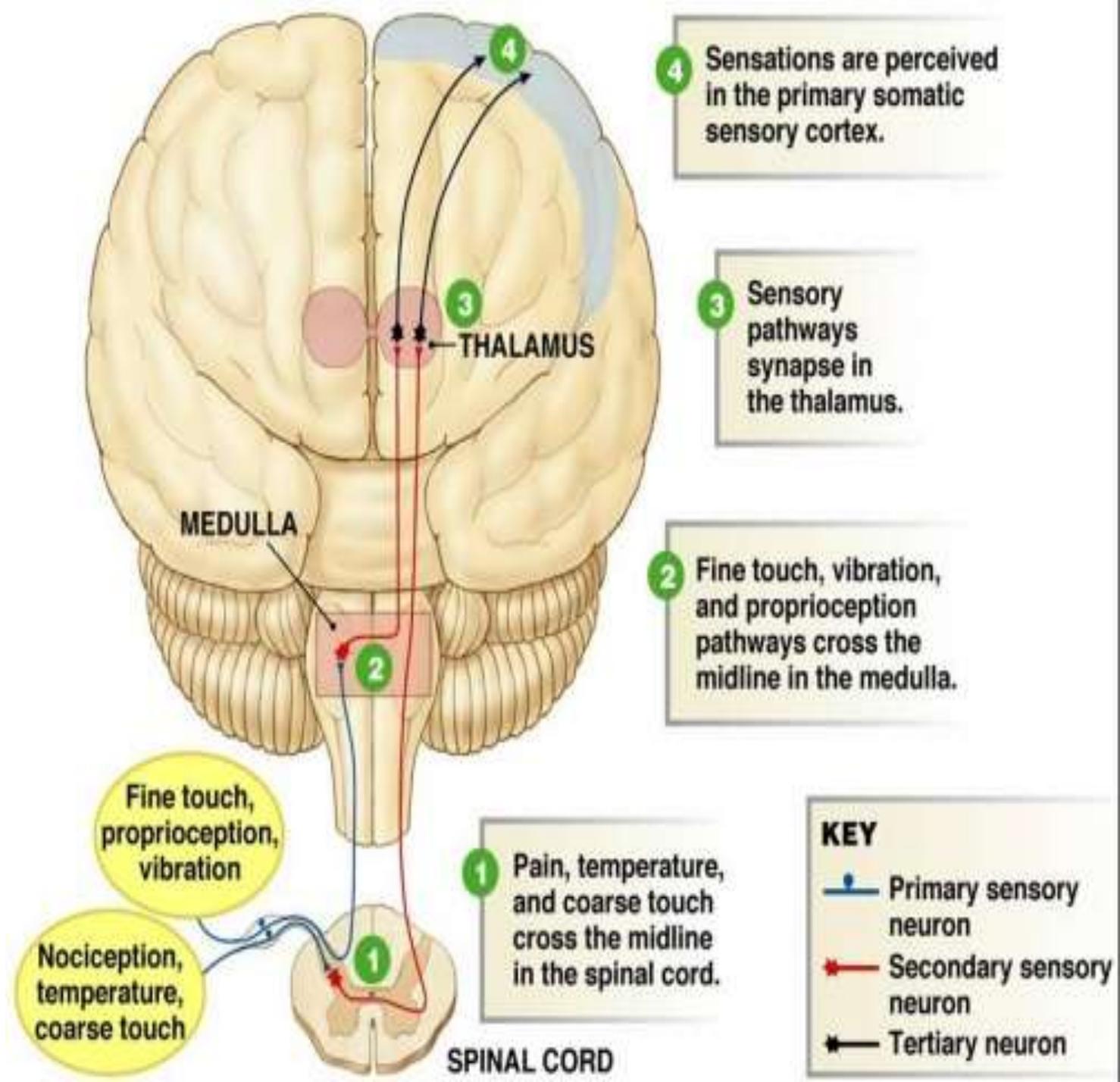
The background features abstract, overlapping geometric shapes in various shades of blue, ranging from light sky blue to deep navy blue. The shapes are primarily triangles and polygons, creating a dynamic, layered effect. The central text is positioned on a white background that is partially framed by these blue shapes.

Somatosensory function, pain, and headache

Somatosensory system

▶ It's the part of the sensory system which concerned with the conscious perception of:

- ▶ Touch
- ▶ Temperature
- ▶ Pain
- ▶ Body positions



وصف للتنظيم والاعلمة
 Lateral horn ← مسؤولة عن
 (Gray matter in the spinal cord)
 autonomic nervous system → lateral horn

receiving information من
 from motor cortex of the brain
 skeletal muscle وجزء من
 voluntary movement

Somatosensory system

③ Sensory info. posterior horn
 that come from outside of the body and process and analyze it

gray matter info. على نقل الـ white matter
 to thalamus then upper brain organs



Three types of neurons are involved:

▶ First-order neurons: Transmit the signals from the organ to the spinal cord.

▶ Second-order association neurons: Transmit signals from the spinal cord to the thalamus where they are roughly localized and perceived as a crude sense.

▶ Third-order neurons: forward the information from the thalamus to the somatosensory cortex, where full localization, intensity discrimination, and interpretation occur.

بشكل الاحساس يوهل
التحيز والاحساس الاعمق.

Somatosensory transmission pathways



Discriminative pathway:

Cross at the medulla

Uses only 3 neurons

Rapidly transmit
information

(proprioception sensation)

*Large
myelinated
α or β fibers*



Anterolateral pathway:

Crosses within the first few segments of
entering the spinal cord

Multiple neurons are involved in the
process

Slow conducting

Nociception

*un myelinated
or small myelinated
delta fibers*

Pain

- ▶ Protective and unpleasant sensation.
- ▶ Originated from pain receptors.
- ▶ It is shaped by previous life experience.
نتيجة تجربة سابقة
- ▶ **Nociceptors:** are receptive nerve endings that respond to noxious of painful stimuli, and transmit impulses to the dorsal horn neurons in the spinal cord.

Pain transmission pathways

- ▶ **Neospinothalamic tract:** Fast and sharply discriminative pain (knife cut). Formed from specific neurons
acute
نشعر بالآلم بشكل سريع
- ▶ **Paleospinothalamic tract:** Slow, continuously conducted pain (chronic pain).
chronic

Processing of pain information

▶ The somatosensory cortex, where pain information is perceived and interpreted.

صقول عن انه متى بشتم بالخوف صقول عن

المشاعر المتعلقة بالألم

▶ The limbic system where the emotional components of pain are experienced, in addition, thirst and hunger can be felt here.

▶ The brain stem centers where responses to the pain occur. It might be somatic which can be controlled or autonomic such as increased heart rate.

* بعض الاجزاء من ال Somatic nervous system

Controlled by autonomic nervous system

Classification of pain

- ▶ Pain can be classified based on location, referral, and duration.

- ▶ **Location:** cutaneous, deep somatic, or visceral pain.

الأعضاء الحشوية
ووصل للعظام والعضلات تحت الجلد

- ▶ **Referral:** is pain perceived at a site different from its origin such as in angina.

الألم مش شرط يخرج من نفس
المكان اللي صار فيه الخلل مثل الـ angina

- ▶ **Duration:**

- ▶ **Acute pain:** is self-limiting pain that ends when the injured tissues heal.

- ▶ **Chronic pain:** is pain that lasts much longer such as frequent headaches or nerve damage.

Special types of pain

- ▶ **Neuralgia:** characterized by severe, brief, often repetitive attacks of lightning-like or throbbing pain.

Sever pain

- ▶ **Trigeminal neuralgia:** one of the most common and severe neuralgias. It is manifested by facial tics or spasms which might be due to an artery rubbing on a nerve. سبب الاله ال artery ضيقه بسببها على ال nerves

- ▶ **Postherptic neuralgia:** a chronic pain that can occur after shingles, an infection of the dorsal root ganglia, and corresponding areas of innervation by the varicella-zoster virus.

Special types of pain

مرض بالأعصاب نفسيا

- ▶ **Neuropathic pain**: May be due to trauma or disease of neurons in e.g. from endocrine disease or neurotoxic medication.

يمكن ليخفي او صكنه يتر سبب قطع للرف من جسم الانسان

- ▶ **Phantom limb pain**: follows amputation of a limb or part of a limb
- ▶ The pain sensations, which may disappear spontaneously or persist for many years, can be similar to those that were present before the amputation, as though the limb is still present

Headache

- ▶ **Headache** is a common disorder that is caused by a number of conditions.
- ▶ Some headaches represent primary disorders and others occur secondary to another disease state in which head pain is a symptom.
- ▶ Primary headache disorders include:
 - ▶ Migraine headache.
 - ▶ Tension-type headache.
 - ▶ Cluster headache.
 - ▶ Chronic daily headache.
- ▶ Although most causes of secondary headache are benign, some are indications of serious disorders such as meningitis, and brain tumor.

meningitis brain tumor

Migraine

- ▶ Migraine headache: neurological disorder characterized by multiphase attacks of uni-lateral head pain associated with nausea, vomiting, noise and light sensitivity.

منطقة هجيرة جزء النصف
الأيسر أو الأيمن

- ▶ The pathophysiology of it is poorly understood.
- ▶ Might be due to neurological disorder characterised by multiphase attacks of head pain.

Tension- type headache

سبب Stress میں

- ▶ Most common.
- ▶ Not sever, so it does not interfere with the daily activities.
- ▶ Occurs in hatband distribution around the head.
- ▶ Not associated with nausea and vomiting.

Cluster headache

بشعر لفترةٍ بعدين بينعطل
طويلة

- ▶ Uncommon
- ▶ Characterised by clusters of headache for weeks the headache free for long period.
- ▶ Pain behind the eye, radiated to the cheek and gum.
- ▶ Associated with agitation, lacrimation, rhinorrhoea and forehead sweetening.
تعرق سيلان الأنف
- ▶ Poorly understandable pathophysiology.

Chronic daily headache

المغزبان ننتجة ال
migrain
او تension

او صمكن ننتجة
استخدام ال
medication
بكثره

- ▶ Occurs 15 days or more a month.
- ▶ Retain some characteristics of migraine or tension-type headache.
- ▶ Common with medication overuse.
- ▶ Unknown cause.

Temperomandibular joint (TMJ) syndrome

Secondary
Cause
headache

- ▶ Temperomandibular joint (TMJ) syndrome is one of the major causes of headaches.
- ▶ It usually is caused by an imbalance in joint movement because of poor bite, teeth grinding, or joint problem such as inflammation, trauma, and degenerative changes.

* imbalance
بحركة المعامل

البناء تتبع المفاصل