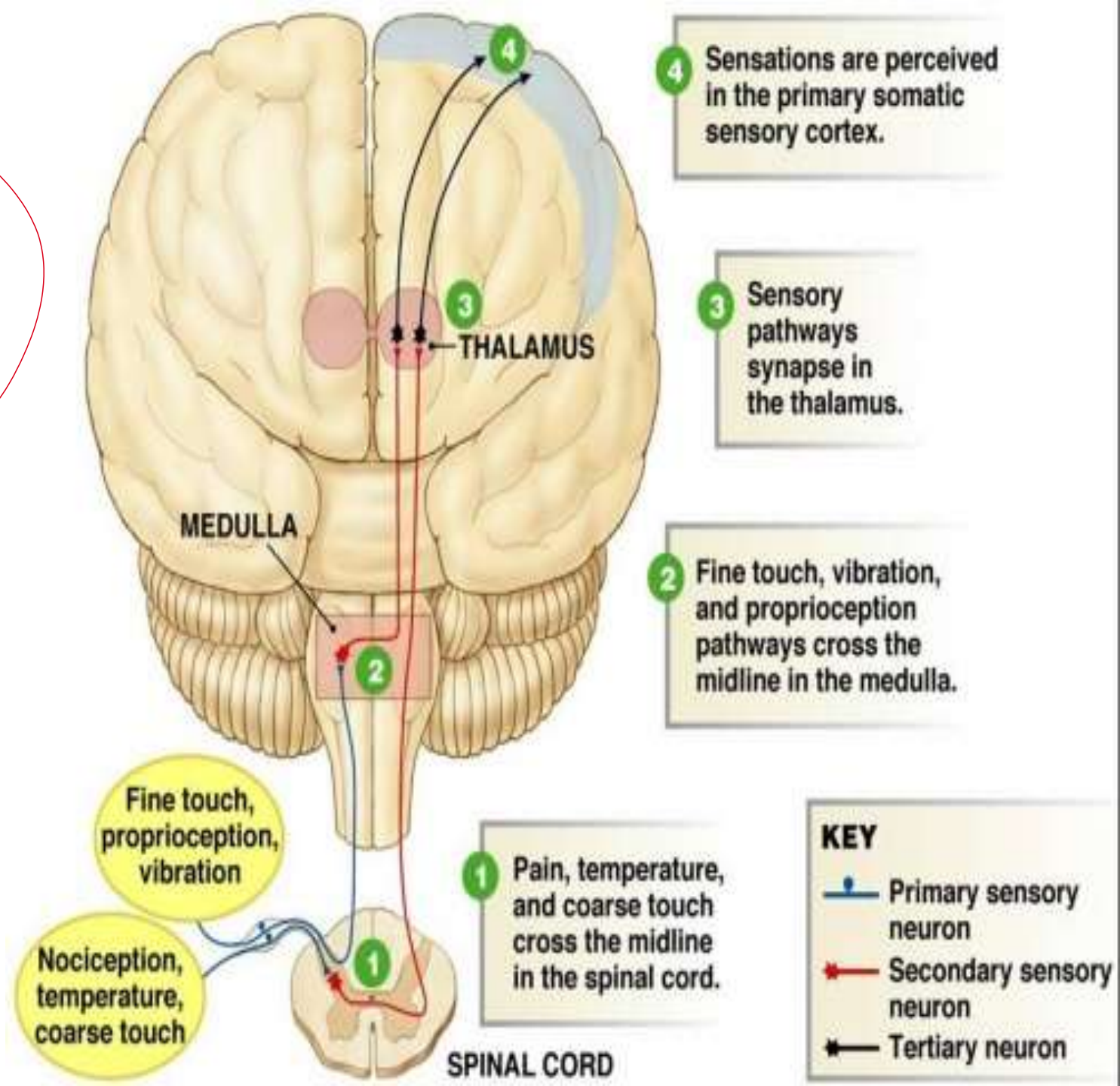
The background features abstract, overlapping geometric shapes in various shades of blue, ranging from light sky blue to deep navy blue. The shapes are primarily triangles and polygons, creating a dynamic, layered effect. The central area is white, providing a clean space for the text.

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



أبداً لا يحصل في جسمك
تكتسبها في مراحلها

Somatosensory system

يتم نقل الإشارة من العبد الشوكي إلى ال Thalamus

الإحساس يكون تعريفي (crude)
أي يعني في أم يسهل وصفه واضح ومنه بالتحديد

من ال Thalamus إلى المخ (Somatosensory cortex)

هناك بصير الفهم
منه الألم؟
كم شدة؟
نوعه؟
أهم مكان للفهم النهائي

▶ Three types of neurons are involved:

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

يبدأ من الجذر أو العصبون عروج للبلد الشوكي (يعتبر الرسول الأول)

▶ 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.

صلى

Somatosensory transmission pathways



(دائماً من حذقت ودرج) **Discriminative pathway:**

Cross at the medulla

Uses only 3 neurons

Rapidly transmit information

(proprioception sensation)

- 1- proprioception (ينقل : احساس وضع الجسم)
- 2- Fine touch

Anteriolateral pathway:

(هذه امثلة الالاتم غالباً)

Crosses within the first few segments of entering the spinal cord

Multiple neurons are involved in the process

Slow conducting

Nociception

- 1- الالاتم ينقل
- 2- الحرارة

تعريف
بأساس مزعوم + واقعي ← هدفه تحذير

مصرف
Nociceptors من مستقبلات آسيميا ←

فای حساسیت لای باسی هوئی
1- حرارت عالیج
2- جرح
3- منغف توی

Pain

(باضعی)

- ▶ Protective and unpleasant sensation.
- ▶ Originated from pain receptors.
- ▶ It is shaped by previous life experience.
- ▶ **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

أنواع نقل الألم



ألم حاد (knife pain) سريع

- ▶ **Neospinothalamic tract:** Fast and sharply discriminative pain (knife cut). Formed from specific neurons



ألم مزمن (chronic) بطيء

- ▶ **Paleospinothalamic tract:** Slow, continuously conducted pain (chronic pain).

Fast = Sharp
Slow = dull

Processing of pain information

كيف الحماة يعالج الألم؟

زيادة الألم (كيف؟)

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

إحساس الألم (كيف الألم مزيج)

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

ردة الفعل للألم
مثلاً - HRP
أو تعرفت

→ **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.

تصنيفات الألم في حسبته

Classification of pain

ألم بمكان غير المصاب
ex: ألم القلب مع ضيق الصدر
بغير مصاب

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

① مكان

②

③

مدة

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

الجلد

العظام

الأعضاء

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

▶ **Duration:**

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

هو وقت

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

طويل

أنواع خاصة

Special types of pain

ألم عصبي قوي جداً

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

ألم الوجع

- ▶ **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.

ألم عصبي بعد المرض

- ▶ **Postherpetic 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

ألم بسبب عائق الأعصاب

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

ألم في جزء من الطرف المبتور

- ▶ **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: *أنواع أولية primary*
 - ▶ 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.

جبهة واحدة
وعنفات + حساسية للضوء

Migraine

- ▶ Migraine headache: neurological disorder characterized by multiphase attacks of uni-lateral head pain associated with nausea, vomiting, noise and light sensitivity.
- ▶ The pathophysiology of it is poorly understood.
- ▶ Might be due to neurological disorder characterised by multiphase attacks of head pain.

أكثر شيوعاً
زي حزام حول
الرأس

Tension- type headache

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

Cluster headache

المس تشييد صافى العيون
على د هو مجوسى لان أنت

- ▶ 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.
- ▶ Poorly understandable pathophysiology.

أكثر من 15 يومًا في الشهر

Chronic daily headache

- ▶ 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

- ▶ 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.