# Hyperhidrosis (excessive sweating)

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- Any site on the body can be affected
  the sites most commonly affected are the palms, soles, and axillae.

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- Idiopathic or secondary to other diseases metabolic disorders, febrile illnesses, or medication use.

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Hyperhidrosis exists in 3 forms:

1-emotionally induced (in which it affects the palms, soles, and axillae),

2-Localized

3-generalized.

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Condition often causes great emotional distress and occupatinal disability for the patient, regardless of the form.

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- Generalized hyperhidrosis
autonomic dysregulation, or
secondary to a metabolic disorder
, febrile illness,
 or malignancy.

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- Localized hyperhidrosis

- may result from a disruption followed by abnormal regeneration of sympathetic nerves

-a localized abnormality in the number or distribution of the eccrine glands,

- may be associated with other (usually vascular) abnormalities.

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- Essential hyperhidrosis

associated with sympathetic overactivity.  It does not appear to be a generalized disorder involving vascular endothelium

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- In adolescents and young adults, an incidence 1.0% is reported
- Severe cases of hyperhidrosis may adversely affect the patient's quality of life.

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- History
  - Essential hyperhidrosis is a dermatolgic and neurologic disorder characterized by excessive sweating of the eccrine sweat glands.
  - Localized hyperhidrosis, unlike generalized hyperhidrosis, usually begins in childhood or adolescence.

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– Hyperhidrosis beginning later in life should prompt a search for secondary causes such as systemic diseases, adverse effects of medication use, or metabolic disorders.

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# Examniation

- Iodine starch test
- Areas that produce sweat will turn Dark blue to Black

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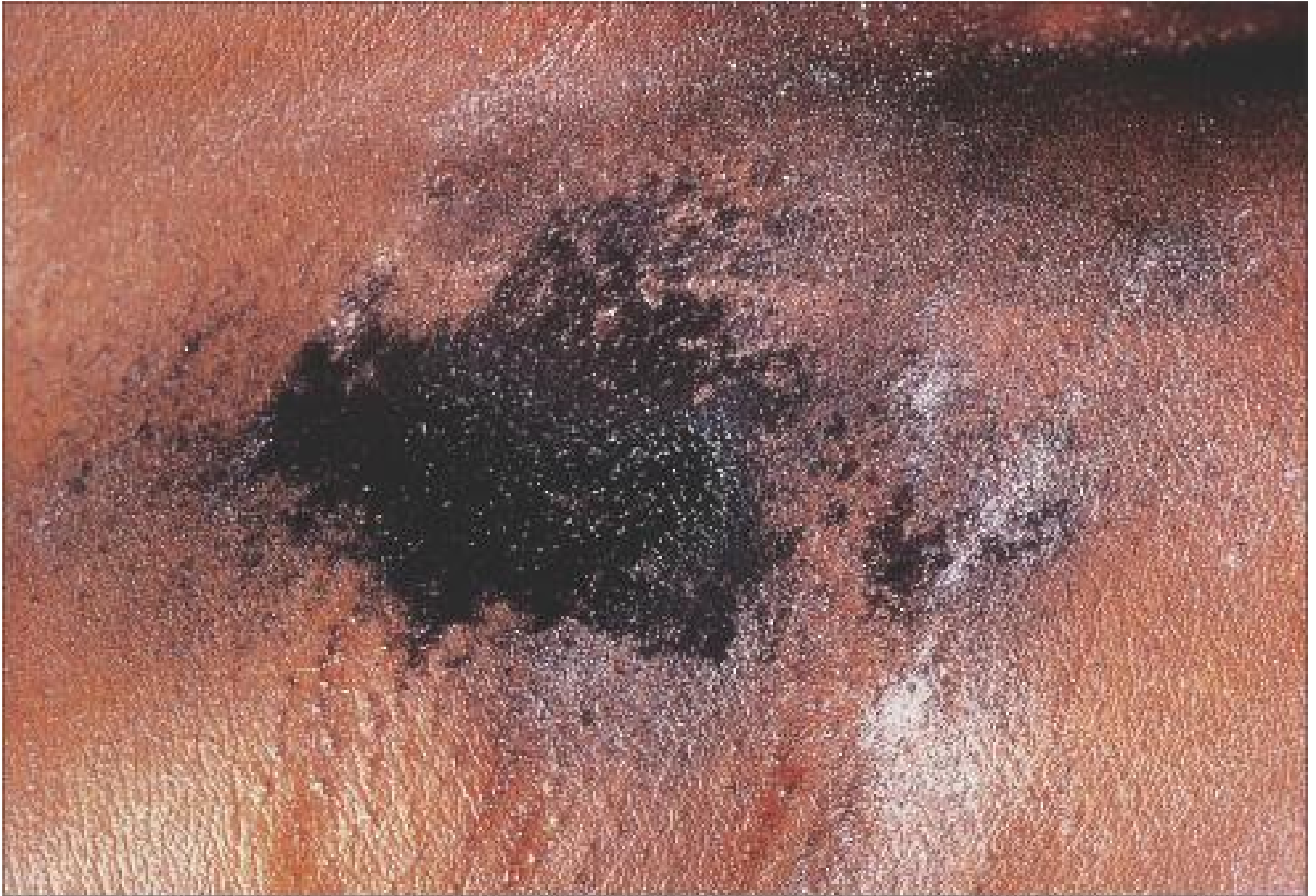

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## Generalized hyperhidrosis (causes)

– Neurologic or neoplastic diseases
– Metabolic disorders or processes

thyrotoxicosis,
diabetes mellitus,
hypoglycemia,
gout,
pheochromocytoma,
menopause

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- Febrile illnesses
- Use of medications (eg, propranolol, physostigmine, pilocarpine, tricyclic antidepressants)
- Chronic alcoholism
- Hodgkin disease or tuberculosis (in nocturnal hyperhidrosis)

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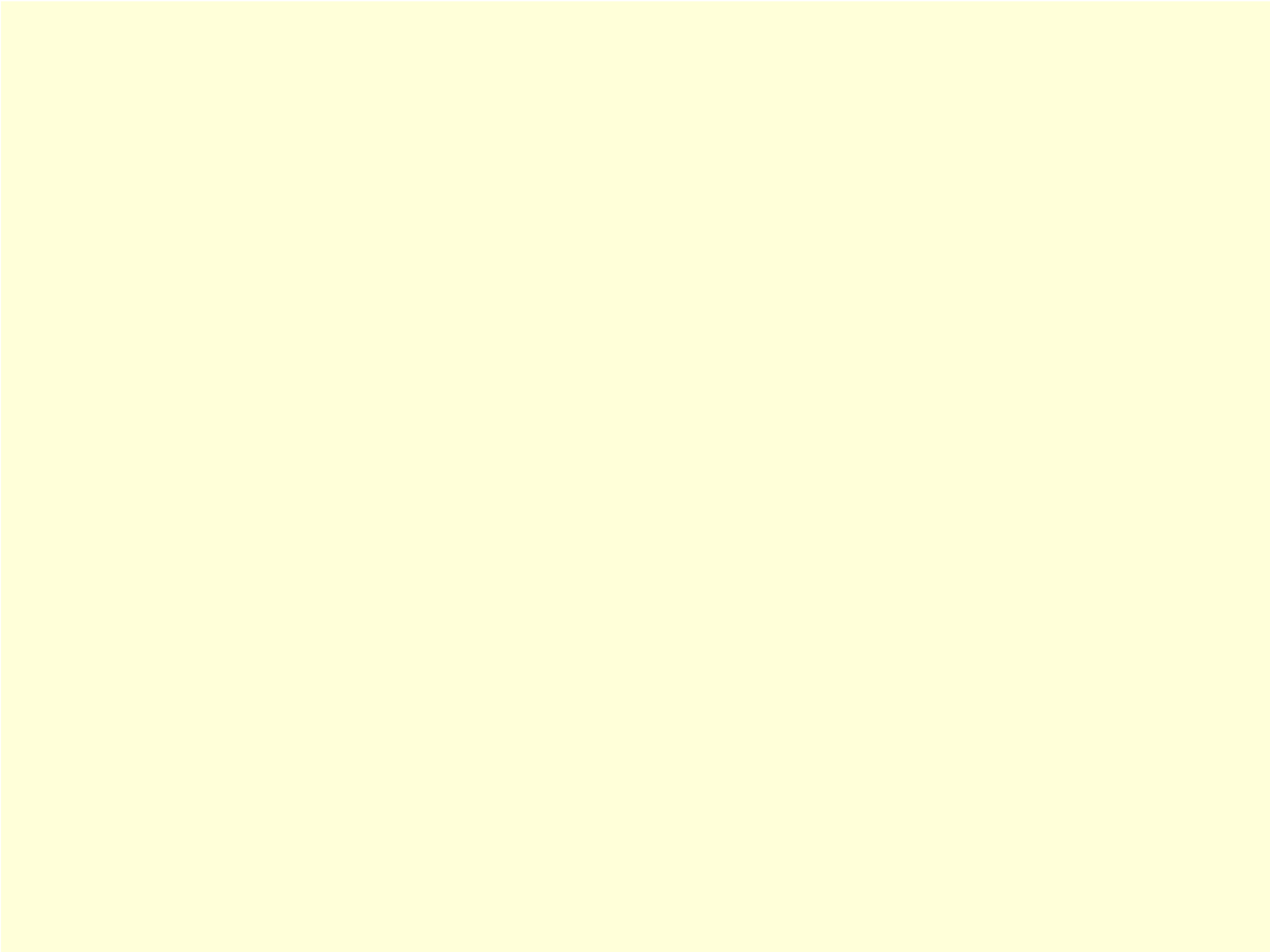

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# Localized hyperhidrosis(causes)

may be emotionally induced and usually affects the palms, soles, and/or axillae.

Unlike sweating on the remainder of the body, sweating on the palms and soles is controlled solely by the cerebral cortex and is responsive to emotional stimuli rather than to temperature stimuli

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Both emotional and thermoregulatory stimuli control sweating in the axillae; therefore, palmoplantar hyperhidrosis, unlike generalized hyperhidrosis, does not occur during sleep or sedation.

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- Localized hyperhidrosis may also be associated with
  - Gustatory stimuli(diabetic neuropathies)
  - Eccrine nevus
  - Peripheral neuropathy, endocrinopathy
  - Burning feet syndrome

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# Workup

– Search for primary causes if generalized hyperhidrosis is noted.

– Important laboratory studies may include the following:
  - **Thyroid function tests**
  - **Blood glucose level**

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# Workup

- **Urinary catecholamines may reveal a possible pheochromocytoma.**
- **Uric acid levels may reveal gout.**

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# Workup

- **A purified protein derivative (PPD) test can be performed to screen for tuerculosis.**

- **Chest radiography may be used to rule out tuberculosis or a neoplastic cause**

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- Complications of Hyperhydrosis
  - Severe cases of hyperhidrosis may adversely affect the patient's quality of life by causing great emotional distress, social embarrassment, and work-related disability (due to palmoplantar hyperhidrosis).

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- Palmoplantar sweating may result in irritation of the affected skin, ultimately leading to chafing.
- Axillary hyperhidrosis may be malodorous, causing social embarrassment.

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# Treatment

- Can be challenging for both the patient and the physician
- Topical agents, Drysol (20% aluminum chloride hexahydrate in absolute anhydrous ethyl alcohol is usually the most effective topical agent.

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Aluminum chloride (20% Drysol)

- Work best if applied to a dry area and covered with plastic overnight.
- Should be washed off in the morning.
- Effect should be noted within 1 mo.

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– Apply to affected area qhs for 2-7 consecutive days prn; to prevent irritation, completely dry area prior to application.

Precautions: not for application on irritated, broken, or recently shaved skin.

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Drysol should be applied nightly on dry skin with or without occlusion until a positive result is obtained, after which the intervals between applications may be lengthened

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- To minimize irritation, the remainder of the medication should be washed off when the patient awakes, and the area may be neutralized with the topical application of baking soda

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- Systemic agents, anticholinergic medications. Are effective because the preglandular neurotransmitter for sweat secretion is acetylcholine.

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- Anticholinergic agents
  - Usually avoided because they are poorly tolerted at the required doses when given systemically.
  - Clinical effects usually occur within days.

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- Adverse effect profile includes mydriasis, blurry vision, dry mouth and eyes, difficulty with micturition, and constipation.

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- Iontophoresis:

 - passing a direct current across the skin,

-the daily treatment of each palm or sole for 30 minutes.

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# Botulinum toxin

- injections effective bacause of their anticholinergic effects at the neuromuscular junction and in the postganglionic sympathetic cholinergic nerves in the sweat glands.

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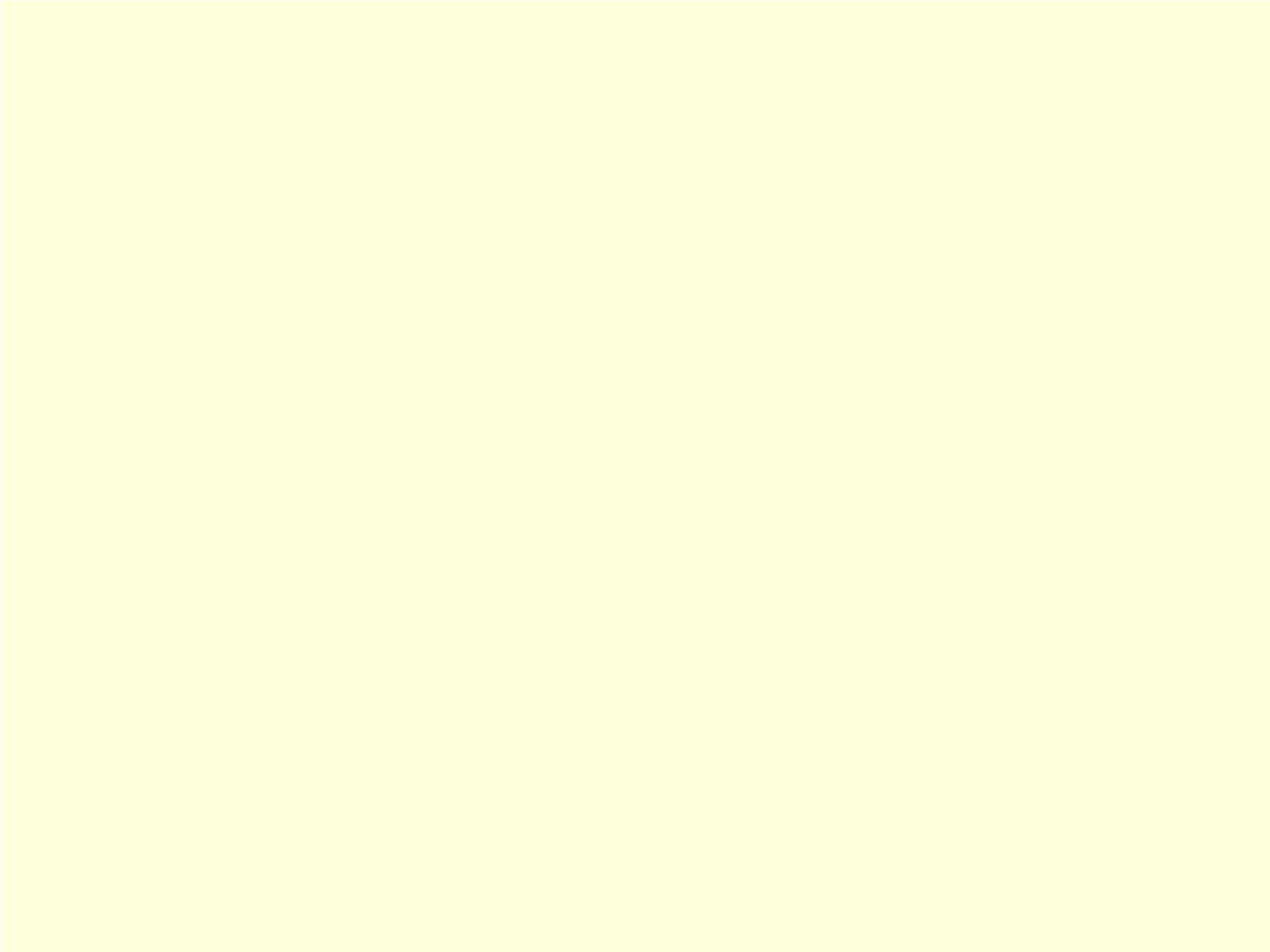

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- Each injection produces an area of anhydrosis approximately 1.2 cm in diameter. Results in anhydrosis lasting 4-12 mo
- Injections of botulinum toxin must be repeated at varying intervals to maintain long-term results.

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- In palmar hyperhidrosis, 50 subepidermal injections of 2 units per palm= total of 100 units per palm –> anhydrosis lasting 4-12 months.
- The only adverse effect is mild transient thumb weakness that resolves within 3 weeks.
- 50 -100 u per axilla subepidermal injections

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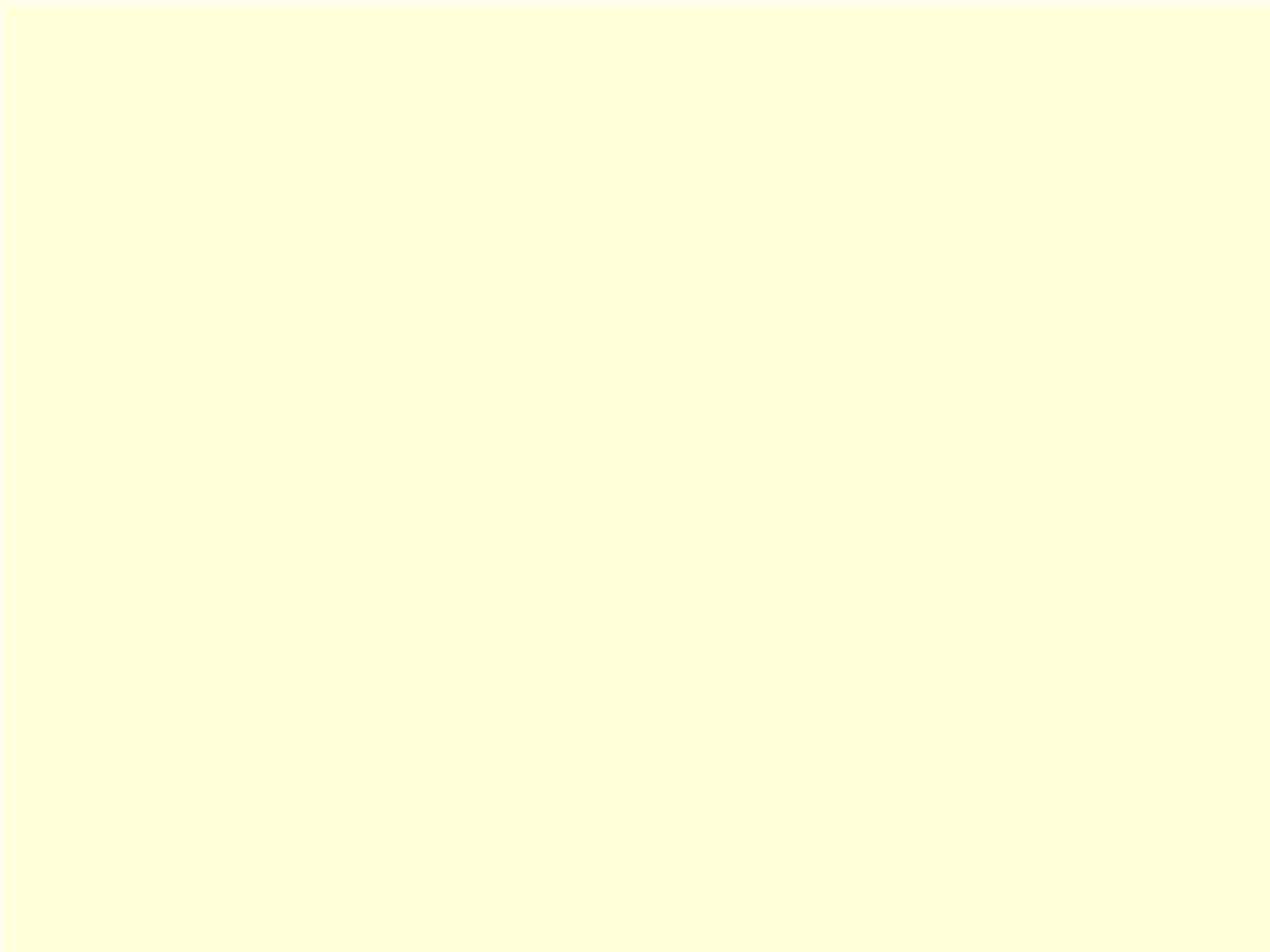

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# Surgical treatment

- Sympathectomy
- Surgical excision of the affected areas
- Subcutaneous liposuction

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- thoracoscopic sympathectomy to be minimally invasive and to improve the patient's quality of life, even if compensatory hyperhidrosis occurs.
- Sympathectomy permanent effective treatment since 1920.

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- Usually, it is reserved for the final treatment option
- Sympathectomy involves the surgical destruction of the ganglia responsible for hyperhidrosis.

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- The second (T2) and third (T3) thoracic ganglia are responsible for palmar hyperhidrosis, the fourth (T4) thoracic ganglia controls axillary hyperhidrosis, and the first (T1) thoracic ganglia controls facial hyperhidrosis.

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- Two surgical approaches are open approach and endoscopic apporach.

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# Complications of surgery

- Compensatory sweating (induction of sweating in previously unaffected areas of the body), gustatory sweating, pneumothorax, intercostal neuralgia, Horner syndrome, recurrence of hyperhidrosis, and the sequelae of general anesthetic use.

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- Endoscopic transthoracic sympathectomy, 55% had compensatory sweating (mostly on the trunk), and 36% had gustatory sweating.

- An effective treatment for such compensatory sweating is the intradermal injection of botulinum toxin.

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- Surgical excision of the affected area (identified with iodine starch testing) removes the appropriate sweat glands, thereby eliminating sweating. This technique is particularly useful in axillary hyperhidrosis.

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- Subcutaneous liposuction

  -removing the eccrine sweat glands responsible for axillary hyperhidrosis.

  -results in less disruption to the overlying skin, resulting in smaller surgical scars and a diminished area of hair loss.

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- Idiopathic or secondary to other diseases metabolic disorders, febrile illnesses, or medication use.

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Hyperhidrosis exists in 3 forms:

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2-Localized

3-generalized.

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Condition often causes great emotional distress and occupatinal disability for the patient, regardless of the form.

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- Generalized hyperhidrosis autonomic dysregulation, or secondary to a metabolic disorder , febrile illness, or malignancy.

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- Localized hyperhidrosis

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associated with sympathetic overactivity. It does not appear to be a generalized disorder involving vascular endothelium

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- In adolescents and young adults, an incidence 1.0% is reported
- Severe cases of hyperhidrosis may adversely affect the patient’s quality of life.

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- History
  - Essential hyperhidrosis is a dermatolgic and neurologic disorder characterized by excessive sweating of the eccrine sweat glands.
  - Localized hyperhidrosis, unlike generalized hyperhidrosis, usually begins in childhood or adolescence.

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– Hyperhidrosis beginning later in life should prompt a search for secondary causes such as systemic diseases, adverse effects of medication use, or metabolic disorders.

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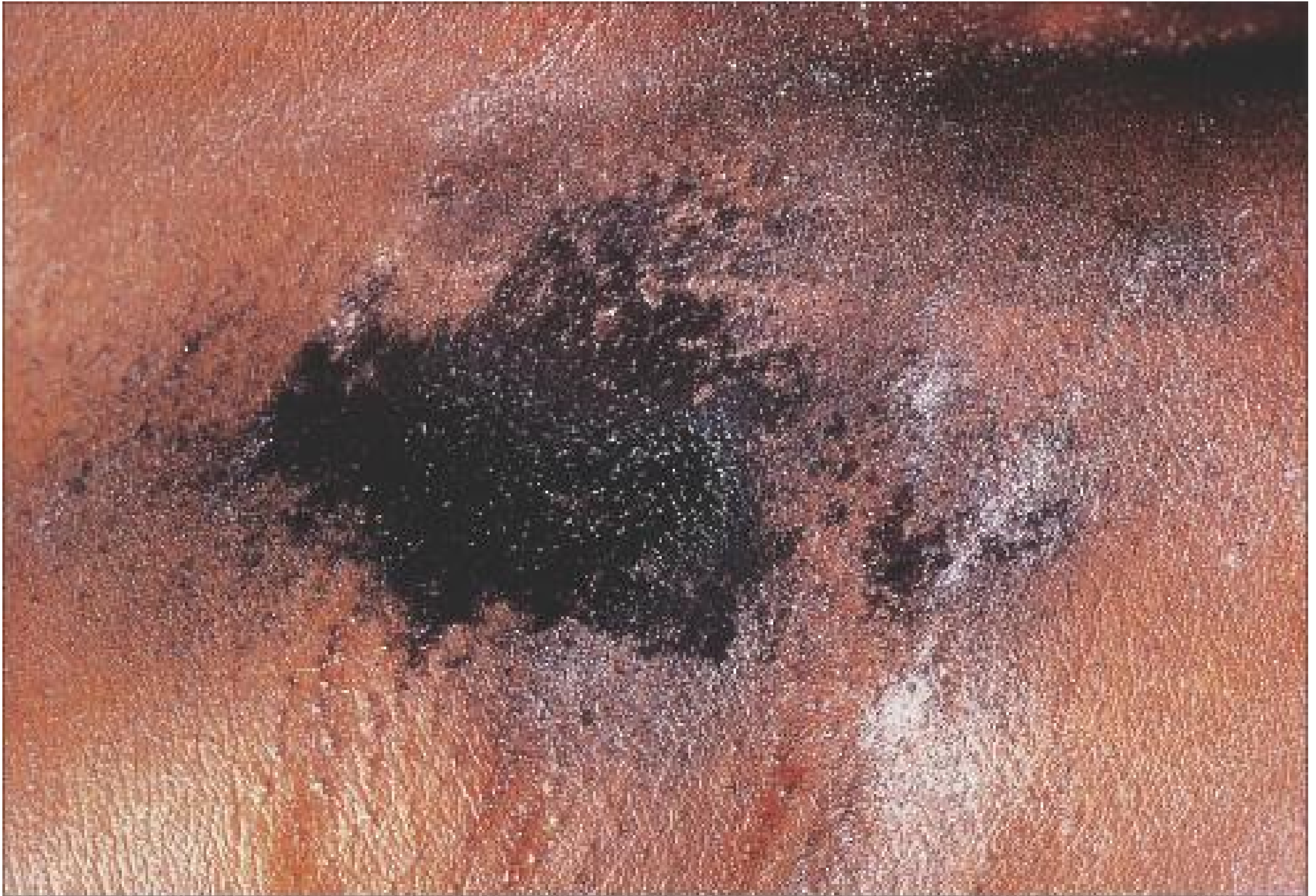

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## Generalized hyperhidrosis (causes)

– Neurologic or neoplastic diseases

– Metabolic disorders or processes

thyrotoxicosis,

diabetes mellitus,

hypoglycemia,

gout,

pheochromocytoma,

menopause

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- Febrile illnesses
- Use of medications (eg, propranolol, physostigmine, pilocarpine, tricyclic antidepressants)
- Chronic alcoholism
- Hodgkin disease or tuberculosis (in nocturnal hyperhidrosis)

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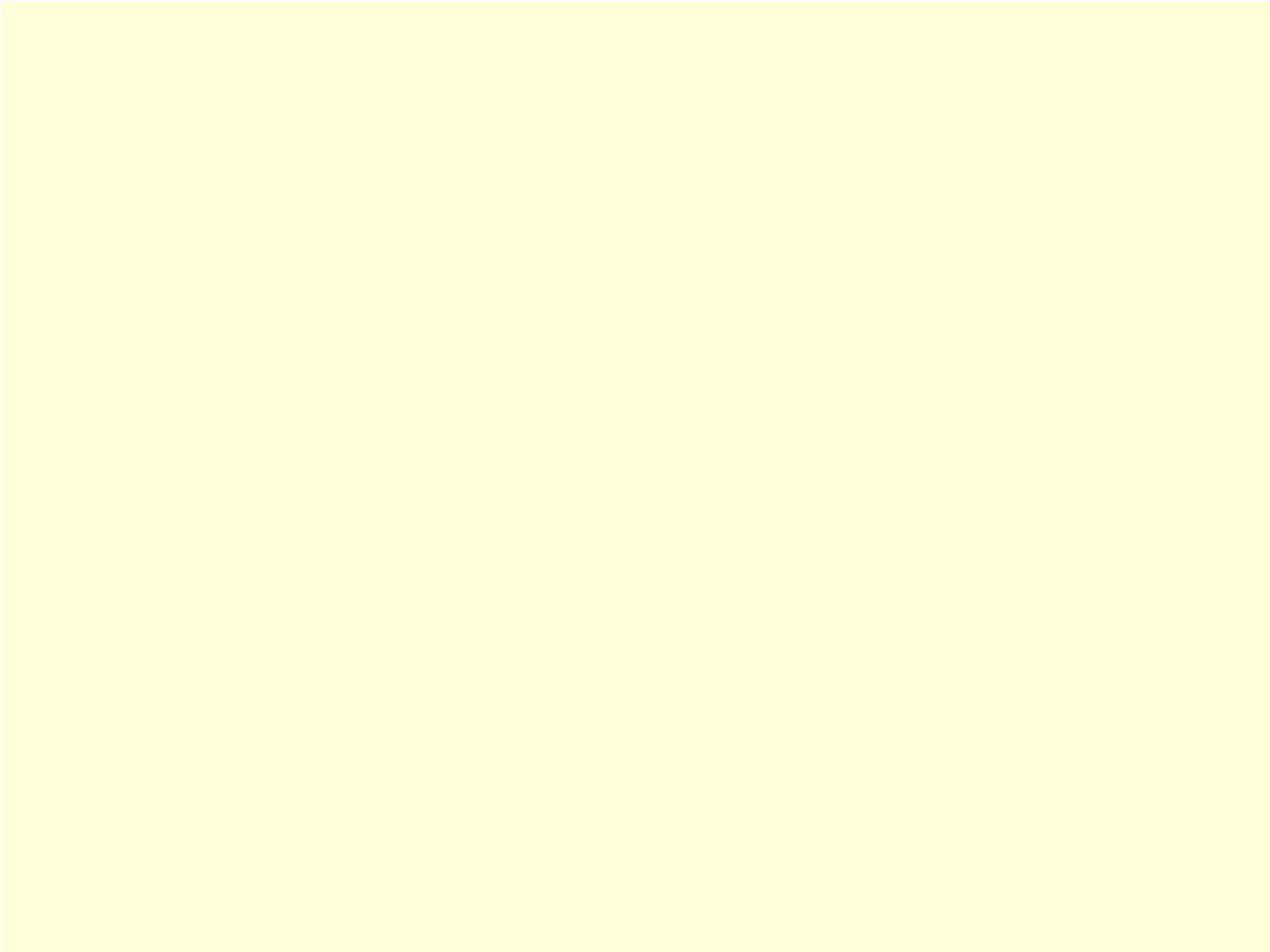

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Both emotional and thermoregulatory stimuli control sweating in the axillae; therefore, palmoplantar hyperhidrosis, unlike generalized hyperhidrosis, does not occur during sleep or sedation.

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- Localized hyperhidrosis may also be associated with
  - Gustatory stimuli(diabetic neuropathies)
  - Eccrine nevus
  - Peripheral neuropathy, endocrinopathy
  - Burning feet syndrome

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# Workup

– Search for primary causes if generalized hyperhidrosis is noted.

– Important laboratory studies may include the following:
  - **Thyroid function tests**
  - **Blood glucose level**

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# Workup

- **Urinary catecholamines may reveal a possible pheochromocytoma.**

- **Uric acid levels may reveal gout.**

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# Workup

- **A purified protein derivative (PPD) test can be performed to screen for tuerculosis.**
- **Chest radiography may be used to rule out tuberculosis or a neoplastic cause**

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- Complications of Hyperhydrosis
  - Severe cases of hyperhidrosis may adversely affect the patient's quality of life by causing great emotional distress, social embarrassment, and work-related disability (due to palmoplantar hyperhidrosis).

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- Palmoplantar sweating may result in irritation of the affected skin, ultimately leading to chafing.
- Axillary hyperhidrosis may be malodorous, causing social embarrassment.

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# Treatment

- Can be challenging for both the patient and the physician
- Topical agents, Drysol (20% aluminum chloride hexahydrate in absolute anhydrous ethyl alcohol is usually the most effective topical agent.

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Aluminum chloride (20% Drysol)

- Work best if applied to a dry area and covered with plastic overnight.
- Should be washed off in the morning.
- Effect should be noted within 1 mo.

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– Apply to affected area qhs for 2-7 consecutive days prn; to prevent irritation, completely dry area prior to application.

Precautions: not for application on irritated, broken, or recently shaved skin.

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Drysol should be applied nightly on dry skin with or without occlusion until a positive result is obtained, after which the intervals between applications may be lengthened

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- To minimize irritation, the remainder of the medication should be washed off when the patient awakes, and the area may be neutralized with the topical application of baking soda

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- Systemic agents, anticholinergic medications. Are effective because the preglandular neurotransmitter for sweat secretion is acetylcholine.

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- Anticholinergic agents
  - Usually avoided because they are poorly tolerted at the required doses when given systemically.
  - Clinical effects usually occur within days.

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- Adverse effect profile includes mydriasis, blurry vision, dry mouth and eyes, difficulty with micturition, and constipation.

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- Iontophoresis:

 - passing a direct current across the skin,

-the daily treatment of each palm or sole for 30 minutes.

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# Botulinum toxin

- injections effective bacause of their anticholinergic effects at the neuromuscular junction and in the postganglionic sympathetic cholinergic nerves in the sweat glands.

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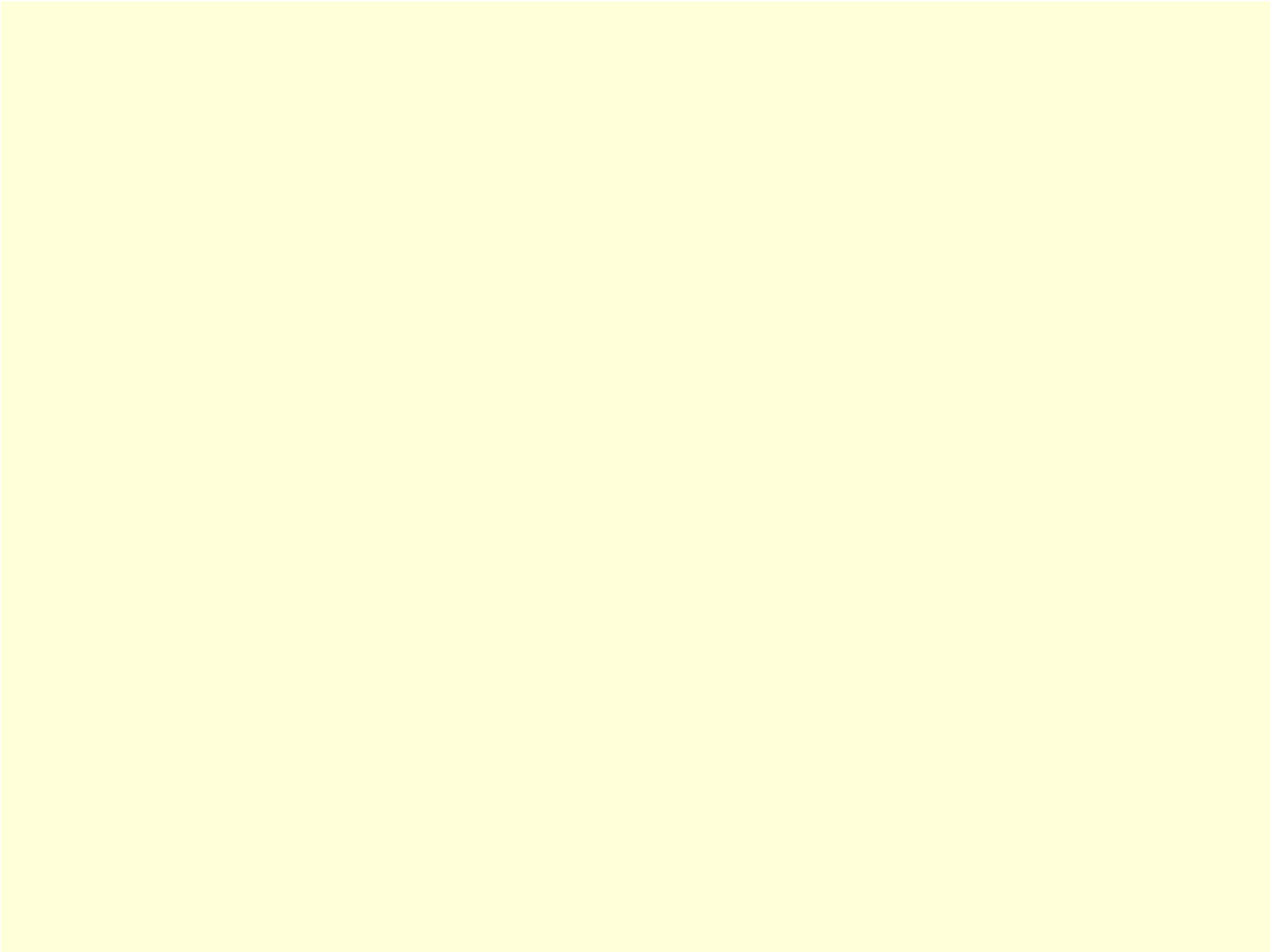

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- Each injection produces an area of anhydrosis approximately 1.2 cm in diameter. Results in anhydrosis lasting 4-12 mo
- Injections of botulinum toxin must be repeated at varying intervals to maintain long-term results.

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- In palmar hyperhidrosis, 50 subepidermal injections of 2 units per palm= total of 100 units per palm –> anhydrosis lasting 4-12 months.
- The only adverse effect is mild transient thumb weakness that resolves within 3 weeks.
- 50 -100 u per axilla subepidermal injections

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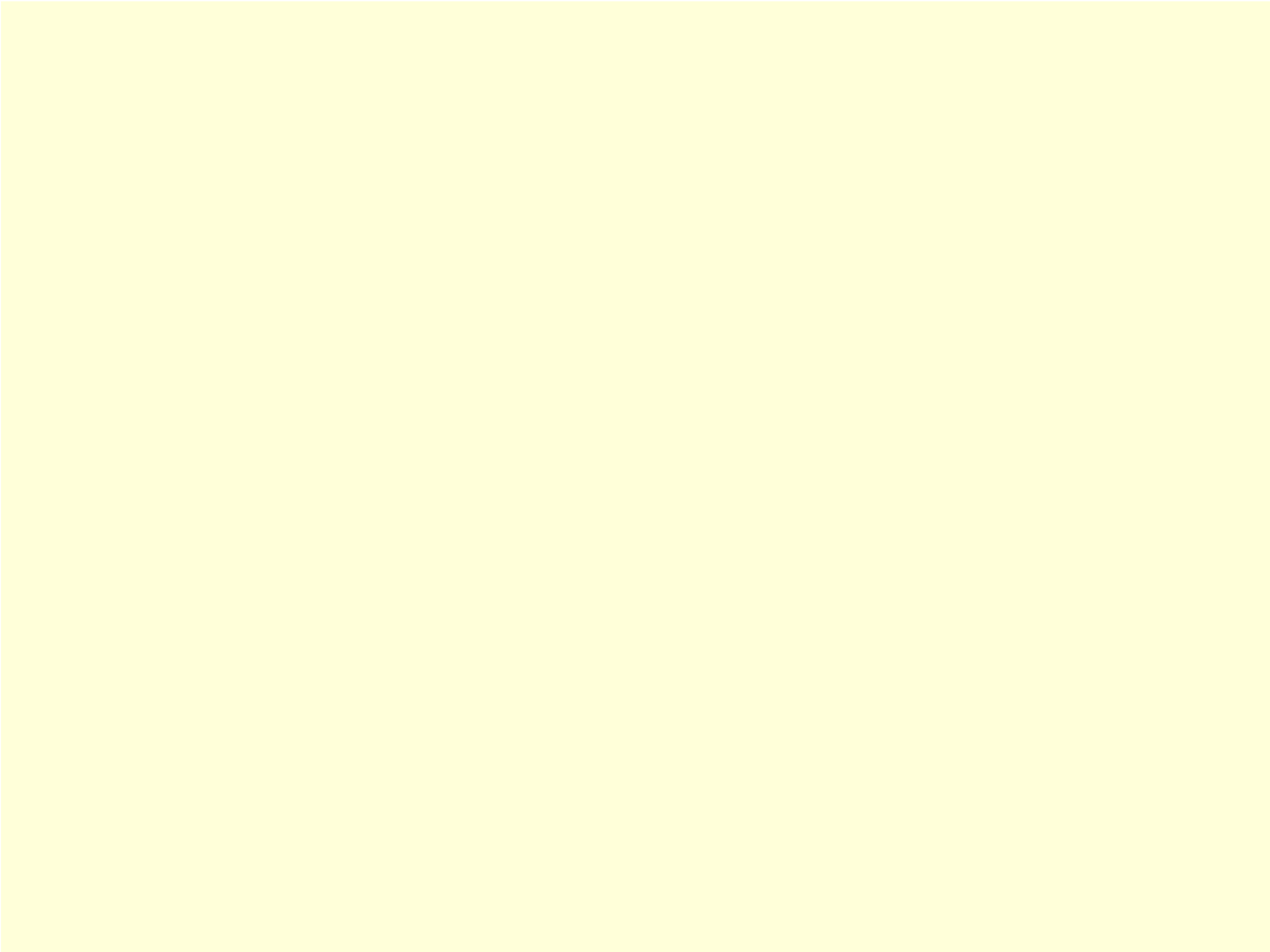

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- Sympathectomy involves the surgical destruction of the ganglia responsible for hyperhidrosis.

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- The second (T2) and third (T3) thoracic ganglia are responsible for palmar hyperhidrosis, the fourth (T4) thoracic ganglia controls axillary hyperhidrosis, and the first (T1) thoracic ganglia controls facial hyperhidrosis.

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- Two surgical approaches are open approach and endoscopic apporach.

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# Complications of surgery

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