Perskindol

professional documentation for physiotherapists

Different treatment strategies for muscle and joint pain as well as sports injuries - with all the efficacy of concentrated natural ingredients

Table of Contents

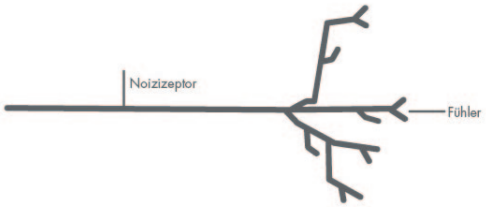
1. What is the mechanism of pain?

1.1 Nociceptors, pain signalling structures

To detect pain, the human body has a highly branched **"warning system"** of specialised pain receptors called **nociceptors**.

The **nociceptor** is the branched terminal of a nerve fibre which redirects stimuli towards the central nervous system.

Nociceptors are polymodal which means that they can respond to **thermal, mechanical** and **chemical** stimuli.



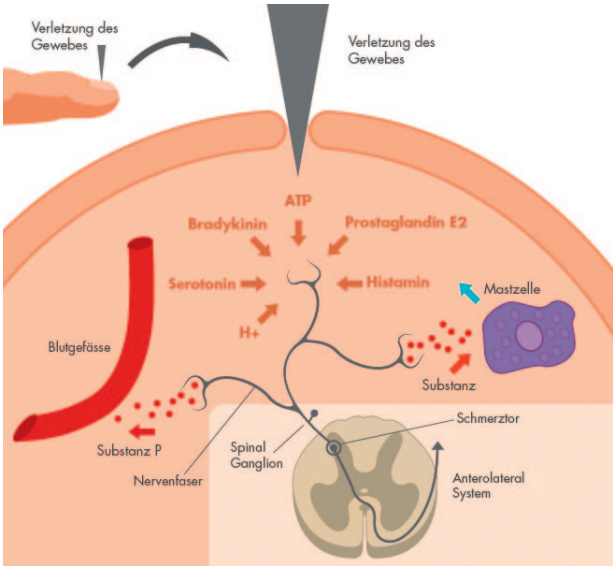
1.2 Pain messengers

Thermal mechanisms or chemical stimuli lead to the release of pain messengers such as prostaglandin E2, serotonin, protons (H+), bradykinin and histamine.

These influencing factors are pro-inflammatory mediators with a capacity to increase nociceptor sensitivity by different mechanisms. When a pain signal occurs, it is conducted to the brain by the nerve pathways.

Hence pain messengers not only induce the sensitisation of nerve terminals but completely modify the chemical environment of the nociceptor, therefore making it more excitable.

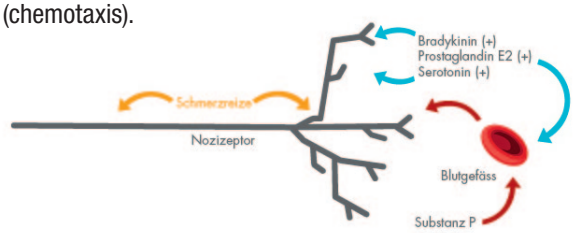
If the nerve terminals are in frequent contact with these messenger substances, an increasingly smaller quantity is required to increase the excitation of the nociceptor. The patient perceives the pain more rapidly and more intensely with a risk of chronification.



1.3 Substance P, amplifier of the pain message

When a nociceptor is more strongly excited, it releases a pain amplifier: “substance P”.

Substance P induces a strong dilatation of the blood vessels and increases the permeability of the vascular walls. Substance P regulates the targeted migration of leukocytes to the inflammation site (chemotaxis).



Substance P is particularly involved in the transmission of pain by the afferent nerve fibres*.

1.4 Pain memory: pain with no triggering factor

Particularly intense or persistent painful stimuli modify the nerve cell. A larger number of ion channels and receptors are formed which send pain signals to the brain at the slightest stimulus or even without any stimulation. The triggering factor is no longer present, but the pain persists.

1.5 How to act on pain

Drugs may act on pain in five ways:

1. Reduction in nociceptor excitability:
   ➞ inhibition of prostaglandin synthesis ➞ analgesic mechanisms of the Perskindol Classic, Cool, Dolo lines.

2. Increase in the nociceptor perception threshold:
   ➞ “Gate control” stimulation and topical anaesthetics ➞ analgesic mechanisms of the Perskindol Classic, Cool, Dolo lines

3. Direct pain-reducing effect on the central nervous system:
   ➞ centrally-acting analgesics (opiates)

4. Inhibition of conduction of impulses by the sensory nervous pathways:
   ➞ conduction anaesthetics

5. Impact on the experience of pain:
   ➞ psychotropic drugs

* Definition: see glossary

2. How do essential oils act?

2.1 Active substances contained in PERSKINDOL products

The active substances in Perskindol are above all essential oils of natural origin. These oils are mainly obtained by steam distillation of the plants from which they are extracted and comprise multicomponent mixtures with a variable composition depending on different factors such as variety, growth conditions or time of harvest.

2.2 How do essential oils exert their effect?

After topical application, essential oils act at three levels:

- by stimulation of receptors on/in the skin
- by the systemic route: after absorption, they penetrate through the skin into the deeper tissue layers
- by stimulation of the limbic system as the principle behind aromatherapy

2.3 How effectively are essential oils absorbed by the skin?

The percutaneous absorption of an essential oil depends on the area of skin on which it is applied, its duration of action and concentration. An essential oil therefore only has a biological effect when there is a sufficient concentration of the pharmacologically active substances at the action site.

The corneal layer of the epidermis constitutes the real barrier to absorption of terpenes* by the skin. The corneal layer is punctuated by hair follicles which do not present a barrier to the penetration of lipophilic and amphiphilic substances. The epidermis located under this stratum corneum also does not constitute an obstacle for lipophilic substances such as terpenes.
As tests have shown, peak blood levels of levomenthol, a-pinene* and b-pinene* are already reached 5-10 minutes after the application of these substances.

This shows that local skin massage with a gel or a fluid containing essential oils is followed by the rapid absorption of the active ingredients into the skin.

Moreover, certain combinations of essential oils accelerate the percutaneous absorption of other active substances. Levomenthol, for example, promotes the absorption of salicylates* contained in Gaultheria oil (methyl salicylate) by a ratio of 2:1 .

In pharmaceutical preparations, the medium in which the active organic substances are incorporated has a considerably impact on their absorption. Hence aqueous or hydroalcoholic gel bases considerably improve and accelerate the percutaneous penetration of active ingredients, whereas in comparison, lipid bases (fatty gels) slow down this

Useful information:

Perskindol products are prepared with a rapidly penetrating hydroalcoholic base which contains all the active ingredients in freely-available dissolved form.

[1] Wolfgang Weyers, Rudolf Brodbeck; Hautdurchdringung ätherischer Öle. 1989
[2] R. Schäfer, W. Schäfer, Die perkutane Resorption verschiedener Terpene, l-Menthol, Campfer, Limonen, sobornylacetat, α-Pinen aus Badezusätzen. 1982
[3] R. Beutner et al, J. Lab. Clin. Med. 28. 1942
* Definition: see glossary

2. How do essential oils act?

2.4 How do essential oils exert their anti-inflammatory action?

All inflammation is a pathological process which takes place locally in the blood vessels and surrounding tissues. The pH of affected tissues falls to acid values (acidosis):

- the tissues accumulate water and swell (oedema),
- enzymes are released and blood flow is increased (redness)
- white blood cells migrate into the inflamed tissues.

Although cooling therapy is useful to reduce the inflammatory process during the acute phase (first 48 hours), hyperaemia* is the essential condition for natural recovery after inflammation.

2.4.1 Inhibition of inflammation by induced hyperaemia

Hyperaemia-inducing essential oils are of major practical importance as anti-rheumatismal and anti-inflammatory substances* as they activate the endogenous regeneration and recovery processes.

Hyperaemia accompanies all spontaneous recovery processes in the body and must therefore be regarded as an important natural recovery mechanism. Hence all regeneration processes are associated with local hyperaemia, i.e. an increase in blood flow in the tissues concerned.
As the effectiveness of regenerative processes increases with the degree of hyperaemia, numerous therapeutic measures aim to induce hyperaemia.

Useful information:

Salicylates are particularly useful for the topical treatment of inflammation insofar as they tend to concentrate in acid medium and therefore act in peripheral tissues, i.e. directly at the inflammation site. Their anti-inflammatory action is due to their effect on prostaglandin E synthesis.

The ingredients of the yellow Perskindol Classic line include menthol, essential pine (needle) and Gaultheria oils, terpineol and terpinyl acetate. These oils have a hyperaemic effect, stimulating the local microcirculation and improving cell osmosis in treated tissues. Patients subjectively perceive this increase in blood flow as a sensation of warmth/coolness or slight burning, itching or tingling.

2.5 The analgesic effect of essential oils is exerted at two levels

Essential oils exert their analgesic effect both at cutaneous and subcutaneous levels.

2.5.1 Immediate cutaneous analgesia

Certain essential oils or their components are known to have a local anaesthetic effect. A local anaesthetic may be used to block, or at least reduce, the pain sensitivity of nociceptors.

The local anaesthetic effect of menthol is well documented. In addition to cold-sensitive thermoreceptors, menthol also stimulates the heat receptors.

The local anaesthetic effect of menthol is well documented. In addition to cold-sensitive thermoreceptors, menthol also stimulates the heat receptors.

Useful information:

When the sensation of cold predominates on certain parts of the body, this means that there are particularly few hot spots. Conversely, menthol often generates a feeling of heat at sites where there is a large majority of hot spots. The change in temperature perception is often accompanied by an anaesthetic and therefore soothing action based on an increase in the nociceptor pain perception threshold.

This action is exploited clinically as it induces an immediately perceptible soothing effect. [4] [5]

2.5.2 Prolonged subcutaneous analgesia

Methyl salicylate is able to cross the epidermal barrier and block nociceptors located in the deeper layers. It penetrates into the nerve terminals and induces a temporary and reversible membrane charge. The development of the electric currents responsible for the transmission of pain impulses by the nerve pathways is blocked at the level of the peripheral nerve fibres. [6]

Useful information:

Because of its capacity to inhibit prostaglandins, the natural methyl salicylate contained in Gaultheria essential oil calms the pain by exerting its biochemical action directly in the affected tissues. Another condition for a lasting analgesic effect, in particular during chronic disorders, is a sufficiently high concentration of active substances.[7]

[4] Reinhold Cale; Ätherische Öle, Anspruch und Wirklichkeit. 1993
[5] Rudolf Hänsel; Phytopharmaka, Grundlagen und Praxis. 1991
[6] U.S. Dep't of Health and Welfare, FDA, External Analgesic Drug Products/Monograph, Fed. Register. 1979
[7] DAZ, Deutsche Apothekerzeitung Nr. 37, 140. Jg. vom 14 .9. 2000
* Definition: see glossary

2. How do essential oils act?

2.6 Counter irritation

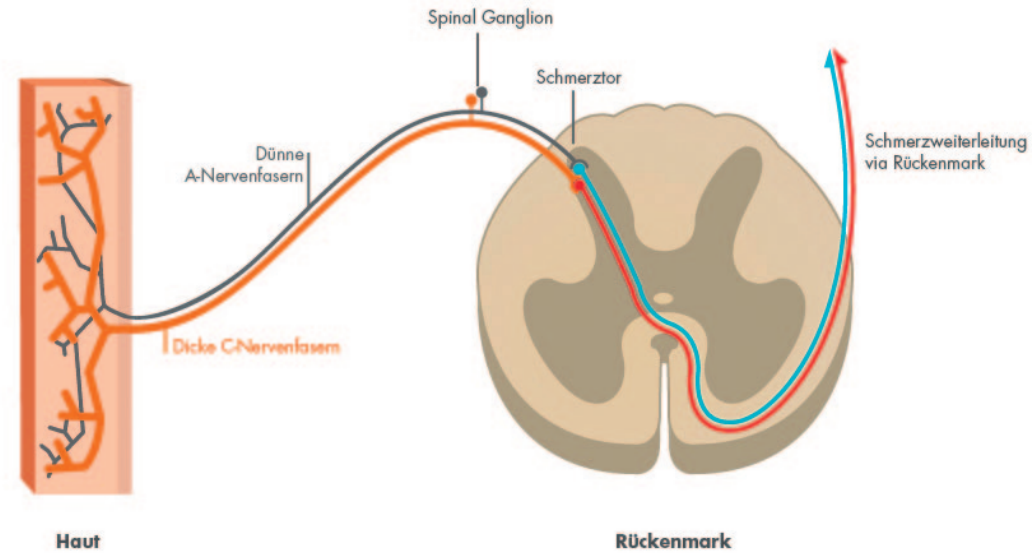
Treatment by counter irritation is based on the hypothesis that the local application of essential oils on the skin may, by stimulating cutivisceral reflex arcs, trigger the activator effects on the circulation and spasmolytic, analgesic and anti-inflammatory effects in the deeper tissues, muscles and organs of the corresponding segments.
This is reinforced by the fact that the effect of counter-irritants, e.g. essential oils, in the treatment of pain has a strong psychological component as it is often associated with pleasant sensations (fragrance, feeling of warmth or coolness).[9]

2.7 Gate Theory: the endogenous pain inhibitory system

"Gate theory" stipulates that the retransmission of pain impulses may be inhibited by thermal, chemical or mechanical stimuli. The pain perception threshold is increased as sensory perception is incomplete.[10]

A stimulus may mask the pain: The gate may be closed by stimulation of nerve fibres (A fibres) responsible for the rapid transmission of stimuli.

Stimuli capable of masking pain are: massage, friction, pressure, acupuncture, electrical stimulation and, more precisely, the cooling thermal stimuli of plant essential oils such as levomenthol, present in Perskindol products.



[8] Reinhold Cale; Ätherische Öle, Anspruch und Wirklichkeit. 1993
[9] Jacknowitz, External Analgesic Products, Handbook of Nonprescription Drugs, 4th Ed.
[10] U.S. Dep't of Health and Welfare, FDA, External Analgesic Drug Products/Monograph, Fed. Register. 1979

2.8 Spasmolytic effect of essential oils in the case of muscle overuse

When a normally irrigated muscle is contracted for a long period without rest, it starts to hurt, as the prolonged contraction reduces blood flow.

Useful information:

Transdermal application of special hyperaemia-inducing essential oils, as a replacement for pain-suppressing spasmolytics, increases cell metabolism, and this has a spasmolytic effect which reduces the concentration of P factor causing pain in muscle cells. Hence, the cause of the pain is locally eliminated and a sufficient blood circulation is restored in the contracted muscle.[11]

2.9 Are essential oils well tolerated?

Even after frequent contacts with essential oils, there is no cumulation of the stimulant effect, as these slightly volatile natural active ingredients are rapidly broken down on the skin. This represents a major advantage for professional use.

Useful information:

As Perskindol* products are applied by the percutaneous route, they directly deliver essential oils to treated tissues and therefore have a local targeted action. Consequently, only very small quantities of active ingredients are absorbed by the body, practically ruling out any systemic side effects and interactions with other drugs.

2.10 Does the application of essential oils induce side effects?

In rare instances, highly sensitive skins treated by products containing essential oils may develop a hypersensitivity reaction with a strong burning sensation at the treated site but this usually rapidly disappears.

In general, individuals who suffer from skin diseases or skin allergies should not apply hyperaemia-inducing substances such as essential oils, nicotine derivatives or camphor, and, more generally, all rubefacients (which irritate the skin).

[11] W.F. Ganong; Lehrbuch der Medizinischen Physiologie. 1974

* Definition: see glossary

3. How are Perskindol products used in practice?

3.1 The action mechanism of all Perskindol products initially aims at mobilising the endogenous recovery mechanisms in order to obtain more rapid therapeutic results.

Useful information:

Instead of being administered systemically like synthetic active ingredients with a central analgesic effect, the natural active ingredients contained in the various Perskindol* products such as menthol, pine needle essential oil, Gaultheria essential oil and terpinols directly target the treated tissues by penetrating the epidermal barrier.

Essential oils therefore act in exactly the same way as many physical therapies successfully used in practise, unlike many synthetic chemical substances which, although they have symptomatic efficacy, often repress or block the endogenous reactions.

Perskindol* products containing essential oils therefore constitute ideal auxiliary treatments in order to consolidate the effect of many basic office therapies. They may also be used by the patient as complementary treatment at home.

* Definition: see glossary
** excpect Perskindol Ibuprofen Akut forte 400

3.2 Table of active ingredients/ingredients of Perskindol products

	CLASSIC	COOL	
	Gel//Spray	Gel/Spray	**Effect**
(l)Menthol			Cools by sublimation and increases the sensibility threshold of the local receptor
Essential oils of Pinus Sylvestris			Activates circulation
Essential oils of Gaultheria Procumbens			Analgesic and anti-inflammatory
Essential oils of Bergamot			Soothing and cooling
Essential oils of Lavender			Soothing
Essential oils of orange peel			Soothing, re-establishes the equilibrium of the muscles
Essential oils of rosemary Heats			Heats, anti-inflammatory
Terpineol/terpineol Acetate			Better penetration into the skin
Essential oils of citrus			Cooling effect

4. Range: Perskindol Classic

4.1 Perskindol Classic: the yellow treatment line for muscle pain and tension.

Classic Gel

Effects

Analgesic, facilitates recovery, stimulates the circulation, relaxant

Areas of application

- Muscle and joint pain
- Muscle aches and cramps
- Warming-up before sport
- Muscular recovery after sport

Practical use

- Rapidly absorbed, no oily after-feel

Classic Spray

Effects

Analgesic, facilitates recovery, stimulates the circulation, relaxant

Areas of application

- Muscle and joint pain
- Muscle aches and cramps
- Warming-up before sport
- Muscular recovery after sport

Practical use

- Practical for difficult-to-reach body areas
- Rapid and optimal distribution

4. Range: Perskindol Cool:

4.2 Perskindol Cool – cooling spray: The cooling line – for first aid treatment

The Perskindol Cool cooling spray line is specifically designed to provide effective cold treatment. Because of its cooling properties it is used for calming pain and reducing swelling of unopened, contused lesions such as strained or pulled muscles, contusions, sprains, bruises and haematomas.

Cooling spray
Effects Analgesic and cooling effect
Areas of application Reduction of swelling of contusion injuries with haematoma formation such as: • Strained muscles • Contusions • Sprains • Bruises • Haematomas
Practical use • Easy to carry around • Rapidly applied: spray several small bursts on the painful area with a circular motion • (➵ spray at a distance of at least 15 cm during application).

5. Instrumental physiotherapy and Perskindol

Therapeutic monitoring:	Indication:	Preparation:	Method:
Continuous current Iontophoresis	Muscle and joint disorers (hyperaemia, spasmolysis)	 **Perskindol Classic Gel**	Apply a layer of gel approximately 5 mm thick on the skin, coat the anode (+) contact area

Therapeutic monitoring:	Indication:	Preparation:	Method:
Ultrasound	Muscle and joint disorders (hyperaemia, spasmolysis)	 **Perskindol Classic Gel**	To be used as gel containing active ingredients instead of conducting gel

Therapeutic monitoring:	Indication:	Preparation:	Method:
Hot wraps	Muscle and joint disorders (hyperaemia, spasmolysis)	 **Perskindol Classic Gel**	1. First apply a layer of about 5 mm to the skin on the area of the body to be treated 2. Place the wrap (allow the skin to breathe). **NB:** Do not use in patients with a history of skin allergy

Useful information:

An ideal medicinal product for iontophoresis is a substance supplied in ionised form in a fluid or gel and which is incorporated locally using a continuous electrical current in the deep tissue layers where it has a hyperaemic, analgesic and anti-inflammatory action. Combinations with salicylates are considered to be highly effective.[12]

[16] Krück et al, Therapie-Handbuch, Urban & Schwarzenberg. 1987

6. Glossary

Terpenes Terpenes are a very large and extremely heterogeneous group of chemical compounds naturally present in the body as secondary components. They are formally derived from isoprene and are characterised by a wide diversity of carbon backbones and a small number of functional groups.
Terpenes are the main constituents of the essential oils produced by plants.[13]

Pinene Pinene, a colourless fluid, is a monoterpene hydrocarbon with molecular formula C10H16. Pinene is a constituent of essential oils. There are four isomers, two a-pinene and two b-pinene isomers.
Pinenes are present in spruce needles, dill, fennel, coriander and cumin, and in certain products such as varnishes, oils and waxes.[14]

Hyperaemia Hyperaemia is an excessive blood influx in an organ or tissue, generally due to vasodilatation. Cutaneous hyperaemia generally occurs after friction of the skin with a product activating the circulation.[15]

Anti-inflammatory drug An anti-inflammatory drug is a medicinal product which combats inflammation. Anti-inflammatory agents are involved in the biochemical mechanisms of the inflammatory process.[16]

Salicylates A salicylate is a salicylic acid salt.
Salicylic acid (o-hydroxybenzoic acid) is present in the form of methylesters in essential oils and as plant hormone in the leaves, flowers and roots of various plants, where it has an important role in plant defences against pathogens. In clinical medicine, salicylates have an anti-inflammatory action.[21]

Afferent nerve fibres The afferent nerve fibres are the nerve fibres which conduct external stimuli to the central nervous system (CNS). Perskindol products act on the afferent nerve fibres.[22]

[17] E. Breitmaier: Terpene – Aromen, Düfte, Pharmaka, Pheromone, 1. Auflage B. G. Teubner Stuttgart, Leipzig 1999
[18] Hobuß, Dennis: α- und β-Pinen: Vielseitige chirale Kohlenstoffgerüste für die asymmetrische Katalyse. Duisburg & Köln WiKu-Wissenschaftsverlag Dr. Stein, 2007
[19] www.reference.md
[20] www.reference.md
[21] http://flexikon.doccheck.com
[22] www.reference.md

7. Patient Information

Perskindol Classic Gel: Active Substances: Menthol 15 mg, Gaultheria oil 3.5 mg, pine needle oil 13.5 mg, lemon oil 1 mg, orange peel oil 4 mg, furocumarine-free bergamot oil 1 mg, rosemary oil 0.6 mg, lavender oil 0.2 mg, terpineol 1 mg, terpinyl acetate 1 mg, Preservatives: methyl and propyl parahydroxybenzoate, benzyl benzoate, excipients q.s. 1 g. **Indications:** Internal traumatic lesions, rheumatic pain of the muscles and joints, epicondylitis, lumbago, sciatica, headache, aches, cramps. **Dosage:** Apply several times daily, where necessary.
Contraindications: Known hypersensitivity to the one of the ingredients, application on open wounds, use in occlusive dressings. Not suitable for use in young children. **Interactions:** Not known.
Pregnancy/Lactation No known risk, though no scientific study is available. **Undesirable effects:** Skin reactions (itching, redness, burns, eczema). **Pack sizes:** 100 ml, 200 ml, 1000 ml**. List D.** Detailed information: Swiss Drug Compendium or www.documed.ch. **Marketing authorisation holder:** Vifor SA • 1752 Villars-sur-Glâne.

Perskindol Classic Spray: Active substances: Menthol 15 mg, Gaultheria oil 3.5 mg, pine needle oil 13.5 mg, lemon oil 1 mg, orange peel oil 4 mg, furocumarine-free bergamot oil 1 mg, rosemary oil 0.6 mg, lavender oil 0.2 mg, terpineol 1 mg, terpinyl acetate 1 mg, Preservative: benzyl benzoate, excipients q.s. 1 g.
Indications: Internal traumatic lesions, rheumatic pain of the muscles and joints, epicondylitis, lumbago, sciatica, headache, aches, cramps. **Dosage:** Apply several times daily, where necessary.
Contraindications: Known hypersensitivity to the one of the ingredients, application on open wounds, use in occlusive dressings. Non suitable for use in young children. **Interactions:** Not known.
Pregnancy/Lactation: No known risk, though no scientific study is available. **Undesirable effects:** Skin reactions (itching, redness, burns, eczema). **Pack size:** 150 ml **List D** Detailed information: Swiss Drug Compendium or www.documed.ch. **Marketing authorisation holder:** Vifor SA • 1752 Villars-sur-Glâne.

Perskindol Cool, cooling spray: Active substances: Levomenthol 5 mg, excipients q.s.1 g.
Indications: Reduction of swelling and relief of pain caused by internal traumatic lesions. **Dosage:** Spray in several short bursts at a distance of 15 cm from the painful areas.
Contraindications: Hypersensitivity reactions to one of the ingredients, contact with the mucosa, open wounds, asthma, children aged < 4 years. **Interactions:** Not known.
Pregnancy/Lactation: No known risk, though no scientific study is available. **Undesirable effects:** Mild skin irritations, redness. **Pack size:** 250 ml **List D.** Detailed information: Swiss Drug Compendium or www.documed.ch. **Marketing authorisation holder:** Vifor SA • 1752 Villars-sur-Glâne.

Vifor Pharma