

# Product Monograph



**Traumeel**<sup>®</sup>

Strong on inflammation, gentle on patients

# Contents

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# 1 Overview

Traumeel® has been used in more than 50 countries around the world for over 60 years, having reached millions of patients with a usage of over 8 million packages a year, of which more than half are ointment and gel.

Acute musculoskeletal injury accounts for a substantial burden on healthcare services and patients, and is a leading cause of absence from work. While inflammation is a crucial part of the healing process, excessive inflammation can be detrimental to recovery. Successful management of acute musculoskeletal injury requires early recognition, identification of the cause and treatment of any specific pathology. However, even the most accepted treatments for acute musculoskeletal injury find little support when critically evaluated.

Traumeel® has been proven effective in the treatment of acute musculoskeletal injury and inflammation. It is indicated as a first-line treatment for patients with blunt injuries, such as sprains, dislocation, contusions, hemarthrosis and effusions into a joint.

Traumeel® contains 14 components from natural sources combined to cover the different aspects of the inflammatory phenomenon. It has a different mechanism of action to conventional anti-inflammatory drugs, and appears to work through complex interactions with the cytokine network, which regulates inflammatory responses. The components of Traumeel® act synergistically to accelerate the process.

Randomized controlled studies have shown that Traumeel® is significantly more effective than placebo and at least as effective as diclofenac in the treatment of musculoskeletal injury. Observational cohort studies have shown Traumeel® to be at least comparable with conventional therapies in terms of resolution of symptoms and time to symptomatic improvement.

Safety studies have indicated that Traumeel® is unlikely to interfere with antimicrobial first defenses, the normal homeostatic process, kidney function or liver function. Post-marketing surveillance has demonstrated very good tolerability for Traumeel® formulations with very few adverse effects. Indeed, tolerability of Traumeel® has been demonstrated to be significantly greater than with conventional treatments.

Investigation of the efficacy and place in therapy of Traumeel® is ongoing with further randomized controlled trials underway.

Traumeel® is suitable for most patients requiring first-line treatment for acute musculoskeletal injury. It may be particularly suitable for patients who are unable or unwilling to tolerate conventional anti-inflammatory medication, or for those in whom such treatment is contraindicated.

Traumeel® is registered as a Homeopathic Medicinal Product for the treatment of blunt injuries.

## 2 Musculoskeletal injuries

### Structure of soft tissue

Collectively, injuries to tendons, ligaments and/or skeletal muscle, are referred to as musculoskeletal soft tissue injuries.<sup>1</sup>

Musculoskeletal injuries are a common reason for sickness absences from work.

Tendons and ligaments are common structures that can be injured as a result of participating in physical activities or specific activities in the workplace.<sup>1</sup> Tendons are collagenous structures with additional tenocytes, water and other matrix components.<sup>2</sup> Some tendons have tenosynovial sheaths, particularly those travelling through narrow areas such as in the hands and wrist, or the ankle.<sup>3</sup> Ligaments have a similar structure to tendons, but they do not have sheaths.<sup>3</sup>

In skeletal muscle, bundles of muscle fibers are enclosed by the perimysium to form fascicles. These in turn are gathered together within the epimysium to form muscle. There are more than 430 voluntary muscles in the body. Skeletal muscle has an extensive and complex blood supply that can be improved by physical training.<sup>3</sup>

In addition, soft tissue includes bursae, which are fluid-filled sacs to minimize friction between adjacent moving structures, and joint capsules, which consist of fibrous collagenous tissue with some synovial lining.<sup>3</sup>

### Epidemiology of musculoskeletal injury

A lack of universally acceptable diagnostic criteria for many soft tissue disorders makes the epidemiology of such complaints difficult to establish. However, while the precise incidence and prevalence of such disorders are difficult to define, they are known to be the most common rheumatic causes of sickness absences from work.<sup>3</sup> Indeed, soft tissue complaints account for up to 59% of new patient referrals to rheumatology practice and up to 15% of consultations in primary care.<sup>2</sup>

Ankle injuries are very common with an estimated incidence of 1 per 100,000 population per day.<sup>4</sup> They account for about one in five of all sports-related injuries. The majority of ankle injuries are moderate ligament sprains. With appropriate treatment the majority of patients should be able to return to normal activities within a few weeks.

Knee injuries can be particularly concerning, especially those affecting the anterior cruciate ligament, as they can cause lengthy absence from normal activities, such as work and physical exercise.<sup>4</sup> The highest incidence of anterior cruciate ligament injuries is seen in young physically active people between 15 and 25 years of age. The incidence is 3 to 5 times higher in women than men. Injury is commonly caused by rotation of the knee, and may be consequence of physical activities such as football, basketball and skiing.

Tendinopathies can result in appreciable morbidity and loss of productivity, representing a major socioeconomic burden.<sup>2</sup> Trigger finger, tennis elbow, Achilles' tendinopathy, and rotator cuff lesions are some of the most common tendinopathies.<sup>2</sup> It is interesting to note that more tennis elbows probably result from industrial work, gardening, or carpentry than from sport.<sup>5</sup> Pain and dysfunction are the main symptoms of tendinopathy, while clinical signs such as swelling or thickening of the tendon are variable.<sup>2</sup>

Soft-tissue injury produces a non-specific physiologic response that activates a series of pro-inflammatory events.

## Classification of musculoskeletal injuries

Periarticular soft tissue complaints include localized disorders of tendons, ligaments, muscles, fascia, and joint capsules.<sup>2</sup>

Musculoskeletal injuries can be classified according to the duration of symptoms. Up to 2 weeks, symptoms may be described as acute, 2–4 weeks may be described as subacute, and if symptoms have been present for over 6 weeks, the condition may be described as chronic.<sup>2</sup>

Traumatic soft tissue injuries may also be classified as macrotraumatic or microtraumatic. A macrotraumatic injury involves a single episode of acute tissue destruction, while a microtraumatic injury involves either chronic overload or an acute-on-chronic episode.<sup>3</sup>

## Tissue response to acute injury

After acute injury, inflammation is the body's method of limiting the amount of tissue damage and protecting against further insult.<sup>6</sup> Injury of soft tissue results in a non-specific physiologic response that activates a series of pro-inflammatory events (see Table 1, page 6). The zone of the primary injury is defined by the extent of the initial hematoma. However, more cell damage can occur from the edema and tissue hypoxia resulting from the acute vascular inflammatory response. This is referred to as the 'secondary zone of injury'.

#### Physiologic response to soft tissue injury<sup>6</sup>

- Immediate vasoconstriction limiting local hemorrhage followed by subsequent vasodilatation and an increase in vascular permeability near the site of injury
- Platelets adhere to one another at the site of capillary damage to provide a mechanical plug to prevent further bleeding
- Activation of the clotting cascade results in the formation of fibrin and fibronectin, which form cross-links with collagen to reinforce the temporary plug and stop hemorrhage
- Pain-producing chemical mediators including bradykinin, serotonin and histamine are released and aid in the attraction of leukocytes to the site of injury
- Leukocytes (neutrophils, eosinophils, basophils, macrophages and lymphocytes) balance clotting and anticoagulation, stimulate local edema, clear debris and have immunologic functions

Table 1. Physiologic response to soft tissue injury.<sup>6</sup>

The inflammatory process contributes to healing once the initial inflammatory response subsides.

After the initial inflammatory response (usually within 24 hours), the inflammatory process becomes a healing process.<sup>6</sup> Damaged tissues are cleared by phagocytosis and the foundation is laid for new tissues. As phagocytosis is nearing completion (normally after several days), the proliferation phase of healing begins. Fibroblasts and granulocytes are drawn to the site of injury by growth factors, and new collagen is produced to replace the injured tissues.

Within a few days of trauma, a new network of capillaries is established to ensure that scar tissue is well vascularized.<sup>6</sup> As new tissue is constructed, the original scar tissue is being dissolved. The scar eventually decreases in size, and tissue remodeling occurs according to the specific demands placed on the healing tissues. Complete scar maturation may take up to 1 year.

### Factors affecting response to injury

For successful management of acute soft tissue injury factors promoting efficient optimal recovery should be maximized.<sup>3</sup> For example, early controlled activity is helpful, but excessive activity may impair recovery. Nutrition is also important, and an adequate intake of protein, energy, vitamins and minerals is required. Inflammation, while part of the healing process, can be deleterious if excessive.

Other factors that can affect the healing process are difficult to modify, but should still be factored into the management process to improve outcomes. For example, tissues take longer to heal with increasing age, partly as a result of morphological and biochemical changes in collagen and elastin fibers.<sup>3</sup> A poor vascular supply may be an important factor in the chronic evolution of soft tissue injuries such as tendon disorders. Endocrine disorders can also have an impact on healing. A poor healing response in diabetes is well recognized, and hypoestrogenism may be associated with an increased incidence of tendinosis.

Genetic factors are implicated in the etiology of many acute musculoskeletal soft tissue injuries.<sup>1</sup> Common musculoskeletal soft tissue injuries for which a genetic contribution has been proposed include the Achilles tendon in the heel, the rotator cuff tendons in the shoulder and the cruciate ligaments in the knee.

### Current treatment options

Successful management of acute musculoskeletal injury requires early recognition, identification of the cause(s), and treatment of any specific pathology.<sup>3</sup> The underlying paradigm is to control pain so that rehabilitation can proceed. Rehabilitation should be individualized, and may include progressive exercises to promote flexibility, proprioception, strength, speed, agility and stability.

Much of the management of musculoskeletal injury has developed based on clinical experience with too little research evidence.<sup>7,8</sup> Consequently, there is a paucity of research evidence concerning acute musculoskeletal injury. Much of common practice is based on historical precedent rather than randomized controlled trials.<sup>7</sup> Indeed, it has been observed that even the most accepted treatments find little support when critically evaluated.

### RICE

Rest, ice, compression, elevation (RICE) is a mnemonic used to guide the early treatment after acute musculoskeletal injury.<sup>7</sup> However, the evidence base for this intervention is lacking and guidance on how to apply ice and/or compression varies between sources. Thus, although widely accepted, there is little evidence for the effectiveness of this intervention, and even suggestion that it may be detrimental to recovery.

The paradigm underlying the successful management of acute musculoskeletal injury is to control pain so that rehabilitation can proceed.

## Non-steroidal anti-inflammatory drugs

Non-steroidal anti-inflammatory drugs (NSAIDs) can be used for analgesia and helping during recovery from acute musculoskeletal injury.<sup>9</sup> Topical NSAID gels can also be effective, as in addition to their therapeutic effects they are useful for self-massage.<sup>9</sup>

While NSAIDs are often used to treat acute musculoskeletal injuries, their efficacy has not been substantiated in the scientific literature.

Conventional NSAIDs act by inhibiting cyclooxygenase (COX)-2 and the pathologic responses to pain and inflammation. In the gastrointestinal (GI) tract, they also inhibit COX-1 activity, decrease prostaglandins, and increase the risk of GI side effects such as life-threatening bleeding.<sup>10</sup> Conventional NSAIDs show dose-dependent side effects, which may limit their use in elderly people or other patients at high risk. Additional side effects include renal dysfunction and platelet inhibition. The COX-2 specific agents (celecoxib) have a decreased incidence of GI toxicity, but increased costs and cardiovascular risks may limit their utility in the elderly and in those with cardiovascular risk factors. COX-2 selective agents (etodolac, meloxicam) have a decreased risk of clinically significant GI side effects compared with other NSAIDs, but the cardiovascular risks are unknown. Even with COX-2 specific or selective agents, GI protectivity may be compromised by concomitant use of even low-dose aspirin, and renal side effects are not decreased.

The Food and Drug Administration (FDA) issued a warning concerning the potential for elevation in liver function tests during treatment with all products (including topical formulations) containing diclofenac sodium. In post-marketing reports, cases of drug-induced hepatotoxicity have been reported in the first month but can occur at any time during treatment with diclofenac.<sup>11</sup>

NSAIDs are known to inhibit neutrophil aggregation and migration to sites of inflammation.<sup>6</sup> NSAIDs also alter neutrophil function in other ways such as the slowing of lysosomal enzyme release, decreased oxidative phosphorylation, and decreased production of substances that are chemotactic for other leukocytes. NSAIDs have also been shown to have anticoagulant effects by acting on platelets.

NSAIDs are commonly used in the treatment of acute soft tissue injuries, yet their efficacy is not substantiated in the scientific literature. Indeed, there are suggestions that the short-term benefits of NSAIDs may be outweighed by long-term compromise of the structure and function of the injured tissue.<sup>6</sup> NSAID use can and does alter certain fundamental processes involved in the

normal healing of injured tissues.<sup>12</sup> For example, experimental studies have documented the negative effects of NSAIDs on healing of skeletal tissues. Thus, the use of NSAIDs can profoundly affect skeletal health.

## Corticosteroid injections

Local corticosteroids are used to reduce inflammation in patients with chronic tendinopathies, they have no role in the management of acute injuries.<sup>2,3</sup> Corticosteroid injections are one of the most commonly used treatments for chronic tendon lesions.<sup>2</sup> However, despite their popularity, the evidence for benefit is lacking and they have potential adverse effects. It is recognized that many of the recommendations for the use of local corticosteroid injections are based on anecdote, and there is no good evidence to support their use.<sup>2</sup>

Local corticosteroid injections have no role in the management of acute musculoskeletal injuries.

When used to treat tendinopathy, corticosteroids can inhibit formation of adhesions, granulation, and connective tissue; reduce tendon mass; and decrease biomechanical integrity and the amount of load that can be taken before failure.<sup>2</sup> The biomechanical effects of peritendinous corticosteroid on human tendons are not established. However, case reports of rupture of tendons after injection are common.<sup>2</sup>

Sepsis is reported in up to 1 in 17 intra-articular or soft-tissue injections.<sup>2</sup> Other commonly reported side effects include tissue atrophy, facial flushing, postinjection flare, and hypersensitivity reactions.

## Traumeel®: a different approach

There is scope for improvement in the management of acute musculoskeletal injury. As much soft tissue pathology represents a failure to repair tissue adequately after injury, improving the wound-healing response seems an appropriate strategy for improving outcomes. Potential targets that have been proposed to achieve this include transforming growth factor beta (TGF- $\beta$ ), which may promote regeneration of the tendon matrix structure and composition.<sup>3</sup> Traumeel® has been shown to stimulate TGF- $\beta$  production,<sup>13,14</sup> and studies suggest that it has beneficial effects on the wound-healing process.<sup>15</sup>

### 3 Composition

All of the formulations of Traumeel® contain 14 components. These are listed in Table 2, including the characteristics\* of each ingredient.

Constituent	Characteristics*	Ointment/Gel per 100 g	Tablets per 300 mg	Ampoules for injection per 2.2 ml
<b>Achillea millefolium</b> <i>Milfoil</i>	Hemorrhages, especially precapillary arteriovenous (anastomosis), oozing hemorrhages	90 mg	0.015 mg	0.0022 µl
<b>Aconitum napellus</b> <i>Monkshood</i>	Fever with hot, dry skin, neuralgia, inflammatory rheumatism; improvement of the vasotonia; analgesic, hemostatic	5 mg	0.03 mg	0.0132 µl
<b>Arnica montana</b> <i>Mountain arnica</i>	To stimulate the healing of wounds, fractures, dislocations, contusions, hematomas, myocardial weakness, neuralgia, myalgia, analgesic, hemostatic	1.5 mg	0.15 mg	0.022 µl
<b>Atropa belladonna</b> <i>Deadly nightshade</i>	Localized reaction phases, cerebral sensitivity with cramp and delirium	5 mg	0.0075 mg	0.022 µl
<b>Bellis perennis</b> <i>Daisy</i>	Dislocations, contusions, sensation of soreness in the abdominal wall/cavity, exudative processes, resorption of edema	100 mg	0.06 mg	0.011 µl
<b>Calendula officinalis</b> <i>Calendula</i>	Slowly healing wounds, promotes granulation, analgesic	450 mg	0.15 mg	0.022 µl
<b>Chamomilla (Matricaria) recutita</b> <i>Chamomile</i>	Anti-inflammatory; stimulates granulation, promotes healing in difficulty healing wounds and ulcers; fistulae, hemorrhoids, mastitis, intertrigo, aphthous stomatitis, conditions of restlessness and excitation, disorders of dentition, otitis media, glandular swellings	150 mg	0.024 mg	0.0022 µl
<b>Echinacea angustifolia</b> <i>Narrow-leaved cone flower</i>	Increase in the mesenchymal defenses; inflammation of all kinds and locations; septic processes; hyaluronidase inhibiting, anti-inflammatory action	150 mg	0.06 mg	0.0055 µl
<b>Echinacea purpurea</b> <i>Purple cone flower</i>	Increase in the mesenchymal defenses; inflammation of all kinds and locations; septic processes; hyaluronidase inhibiting, anti-inflammatory action	150 mg	0.06 mg	0.0055 µl
<b>Hamamelis virginiana</b> <i>Witch hazel</i>	Venous stasis, varicose veins, (thrombo-) phlebitis, crural ulcers, hemorrhoids, venous hemorrhages, anti-inflammatory, analgesic	450 mg	0.15 mg	0.022 µl
<b>Calcium sulfide</b> <i>Homeopathic name: "Hepar sulfuris"</i>	Tendency to suppuration, especially on the skin and lymph glands (furuncles, pyoderma, panaris, phlemons), tonsillar abscesses, chalazions, hordeolums, hemicrania, urinary disorders, hypersensitivity to cold and draughts	0.000025 mg	0.0000003 mg	0.0000022 µl
<b>Hypericum perforatum</b> <i>St. John's wort</i>	Neural and cerebral injuries, e.g. commotio cerebri neural pains upon or after injuries hemostatic	0.00009 mg	0.03 mg	0.0066 µl
<b>Mercuro-amidonitrate</b> <i>Homeopathic name: "Mercurius solubilis Hahnemanni"</i>	Suppurations, abscesses, gingivitis, stomatitis, nasopharyngeal catarrh, catarrh of the sinuses, cholangitis, shrinking action on edematous conditions	0.00004 mg	0.0000003 mg	0.0000011 µl
<b>Symphytum officinale</b> <i>Comfrey</i>	To accelerate callus formation in fractures periostitis, causalgia, disorders arising from amputation stumps contusions	0.01 mg	0.00000024 mg	0.0000022 µl

Table 2. Traumeel® product absolute empiric composition and characteristics\*.

**Carrier substances**

**Ointment** – Cetostearyl alcohol, paraffin, 13.8% alcohol

**Gel** – Carbomers, sodium hydroxide, 25% alcohol

**Tablets** – 6 mg lactose, 1.5 mg Mg-stearate

**Ampoules for injection** – 0.9% saline solution

In some countries the number of ingredients and their concentration may vary slightly. For country-specific product information, please contact your local Heel partner.

**Note**

\* Characteristics with reference to: Reckeweg H-H. *Materia Medica – Homoeopathia Antihomotoxica*". 4th edition. Baden-Baden: Aurelia Verlag, 2007.

## 4 Mechanism of action

### Therapeutic indications

Traumeel® is an effective treatment for acute musculoskeletal injury and inflammation. It is suitable for use in patients who require relief of symptoms associated with such injury.

Traumeel® is indicated as a first-line treatment for patients with blunt injuries, such as sprains, dislocation, contusions, hemarthrosis and effusions into a joint.



Traumeel® provides a multitargeted, synergistic action to address multiple aspects of the inflammatory process and promote healing.

### Synergistic multitargeted action

The ingredients of Traumeel® are composed to cover the different aspects of the inflammatory phenomenon (see Figure 1).

As well as providing an anti-inflammatory action, the components of Traumeel® act to correct the effects of inflammation on body tissues. Thus, Traumeel® not only reduces inflammation, but it relieves pain and bruising and promotes healing after injury.

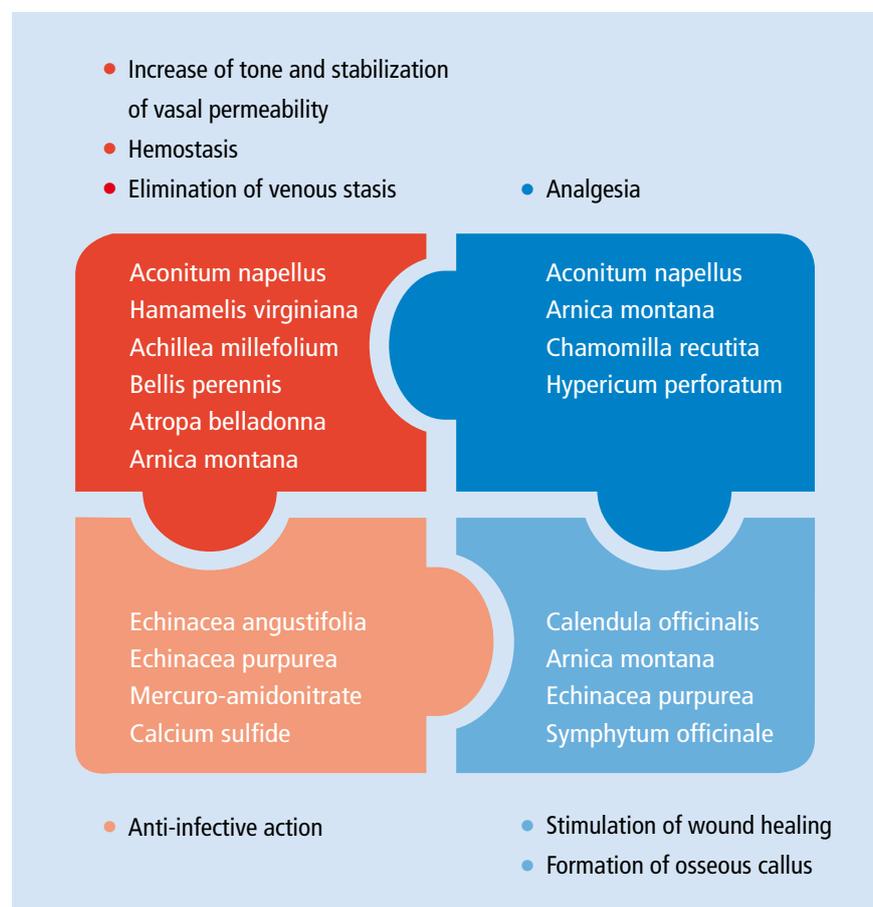


Figure 1. Synergistic multitargeted action of Traumeel®.

It has been suggested that *Aconitum*, *Chamomilla*, *Hamamelis* and *Hypericum* may reduce the pain associated with inflammation. *Aconitum*, *Arnica*, *Hamamelis*, *Hypericum*, and *Millefolium* may have antihemorrhagic effects. *Arnica*, *Calendula*, *Symphytum* and *Echinacea* may accelerate wound healing. *Mercuro-amidonitrate* may be an anti-inflammatory and anti-viral agent. *Hamamelis* may prevent the venous stasis. *Calcium sulfide* may improve cellular respiration.<sup>15</sup>

## Pharmacodynamic properties

Traumeel® does not appear to exert its therapeutic effects via the same mechanisms as conventional anti-inflammatory drugs.<sup>16</sup> Instead, it appears to interact with the fine and complex regulation of acute local inflammation.<sup>16</sup> While the precise mechanism of action of Traumeel® is not fully understood, *in vitro* and *in vivo* studies have shown that Traumeel® may exert an effect on regulatory pro-inflammatory and anti-inflammatory mediators (see Figure 2).<sup>13,14,17</sup>



Traumeel® works differently from conventional anti-inflammatory drugs.

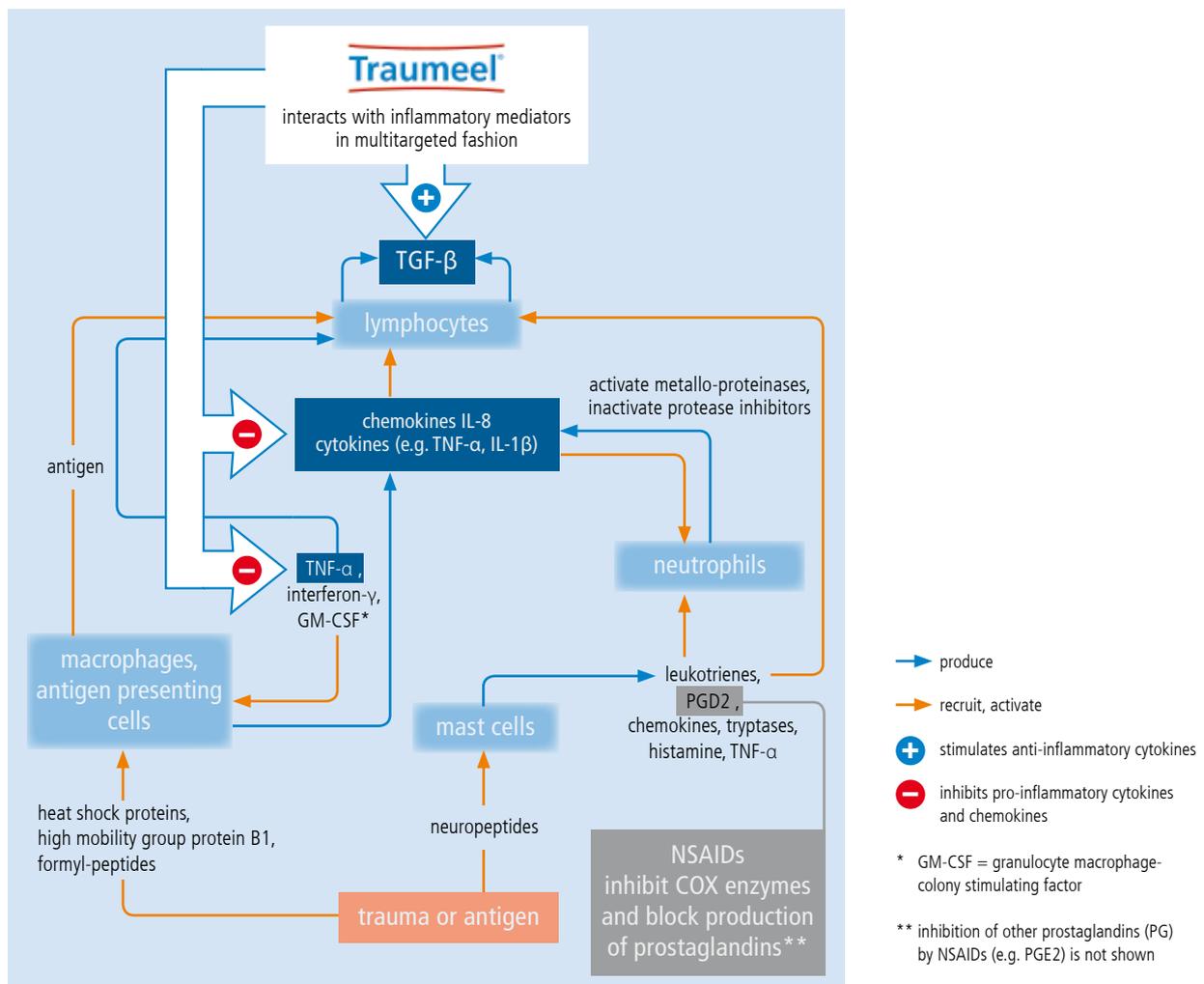


Figure 2. The observed effects of Traumeel® on mediators of inflammation.<sup>13,14,17</sup>

Adapted from: Nathan C. Points of control in inflammation. *Nature*. 2002;420(6917):846-852.

### *In vitro* studies

Transforming growth factor beta (TGF- $\beta$ ) has been established as a mediator that inhibits immune-system cells. Thus, the local production of TGF- $\beta$  by regulatory T cells can prevent other pro-inflammatory lymphocytes from continuing to support the actual inflammatory reaction. This is known as the “bystander reaction”.<sup>13</sup>

*In vitro* studies utilizing whole blood cultures to more closely approximate conditions *in vivo*, have shown that low-potency plant extracts, such as those used in Traumeel<sup>®</sup>, are capable of stimulating production of the inhibitory cytokine TGF- $\beta$ .<sup>13</sup> These findings have been confirmed *in vivo* with Traumeel<sup>®</sup> (see page 15).<sup>14</sup>



Traumeel<sup>®</sup> has been shown to reduce the secretion of pro-inflammatory cytokines and chemokines *in vitro*.

Traumeel<sup>®</sup> has been shown to have an effect on the secretion of the pro-inflammatory cytokines transforming necrosis factor alpha (TNF- $\alpha$ ) and interleukin (IL)-1 $\beta$ , and chemokine IL-8.<sup>17</sup> *In vitro*, Traumeel<sup>®</sup> has been shown to reduce secretion of:<sup>17</sup>

- IL-1 $\beta$  by up to 70% in both resting and activated T cells and monocytes (p<0.05)
- IL-1 $\beta$  by up to 50% in resting human gut epithelial cells and 80% in TNF- $\alpha$ -activated gut epithelial cells (p<0.01)
- TNF- $\alpha$  by up to 65% in resting T cells and monocytes, and up to 54% in activated T cells and monocytes (p<0.01)
- IL-8 by up to 50% in both resting and activated monocytes (p<0.05).

Conversely, Traumeel<sup>®</sup> did not increase the secretion of these pro-inflammatory mediators, whether or not the cells were activated by other means, suggesting that Traumeel<sup>®</sup> lacks any activating (or pro-inflammatory) capacity.<sup>17</sup> These results support the characterization of Traumeel<sup>®</sup> as an anti-inflammatory medication.<sup>17</sup>

In addition, *in vitro* studies have shown that Traumeel<sup>®</sup>, at the highest concentration attainable in connective tissues by local injection, is not toxic to leukocytes and platelets. Thus, the normal defensive and homeostatic functions of these cells are preserved (see Clinical safety section, page 42).<sup>16</sup>

## In vivo studies

Investigation of the levels of regulatory T cells in patients with mild chronic rheumatoid arthritis before and after 14 days of treatment with Traumeel® revealed that counts of regulatory T cells were increased in the majority of patients.<sup>14</sup> This provides support for the concept of the immunological bystander reaction in the action of Traumeel® on inflammation. Regulatory Th3 cells oversee immunological tolerance in the body by releasing the anti-inflammatory cytokines TGF- $\beta$  and IL-10 as necessary. These cellular messengers form an information network in the body, which reacts to any change in homeostasis. Thus, Traumeel® is proposed to act by intervening in the restoration of immunological tolerance.

## Pre-clinical studies

*In vivo* assessment of Traumeel® in acute inflammation has utilized the carrageenan-induced edema test in rats.<sup>16</sup> The carrageenan-induced edema test involves injecting a rat paw with carrageenan, which induces edematous swelling, and measuring the degree of increase in paw volume in the presence or absence of Traumeel® (saline was used as a control). A significant reduction in edema volume of up to 15% was observed when Traumeel® was injected an hour before carrageenan ( $p=0.05$ ). This level of inhibition is similar to the effect exerted by aspirin at a dose of 30 mg/kg in the same experimental model.

Traumeel® has also been investigated in chronic inflammation using an adjuvant arthritis model in rats.<sup>16</sup> The therapeutic administration of Traumeel® led to a significant reduction in acute local inflammation (first phase of adjuvant arthritis) in comparison with the controls. However, Traumeel® did not appear to modulate the arthritic process, instead the effects of Traumeel® were limited to a symptomatic action on local inflammation.

Further investigation utilized an intra-paw injection of a small amount of homologous blood to model a traumatic blood extravasation in rats.<sup>15</sup> The effect of Traumeel® on edema development following local blood injection was found to document a time-dependent edema reduction. During the first hour, increase in paw volume was identical between Traumeel® and controls, however, during the second hour Traumeel®-treated paws decreased in volume while control-treated paws increased in volume with a peak at 2 hours. At 3 and 5 hours post blood injection, local inflammation was significantly lower in rats treated with Traumeel® compared with controls ( $p<0.05$  at 3 hours and  $p<0.01$  at 5 hours).



Animal studies indicate that Traumeel® acts to speed up the healing process rather than blocking the development of edema.

Interestingly, when only the components of Traumeel® that demonstrated individual edema inhibition were injected, the effect was lower than that of the complete Traumeel® formulation suggesting a synergistic effect of the other components.<sup>15</sup> Also, when levels of IL-6, a pro-inflammatory cytokine, were examined at 5 hours post blood injection, levels were significantly reduced by 45% in Traumeel®-treated rats compared with controls.

“The effect of Traumeel® is higher than the ‘sum’ of its active constituents.”<sup>15</sup>

## Summary

It can be concluded that Traumeel® seems to act by speeding up the healing process instead of blocking the development of edema from the beginning. Thus, it appears that Traumeel® accelerates the tissue changes involved both in the formation and in the elimination of edema, with a net beneficial effect.<sup>15</sup>



The components of Traumeel® act synergistically to accelerate the healing process.

While the precise mechanism of action of Traumeel® has yet to be fully elucidated, it appears likely that it has complex interactions with the cytokine network, which regulates inflammatory responses. Studies have shown that Traumeel® produces decreases in concentrations of pro-inflammatory mediators, including TNF- $\alpha$ , IL-1 $\beta$ , IL-6 and IL-8, as well as an increase in TGF- $\beta$  secretion probably via an increase in regulatory T cell expression.

It is also apparent that the effect of Traumeel® is not mediated by any one action of its individual constituents. Rather the components of Traumeel® act synergistically to accelerate the healing process. Thus, further work is needed to detail the multifaceted actions of Traumeel® on the complex network of cytokines regulating the inflammatory process.

## Relationship between concentration and activity

The formulations of Traumeel® use ultra-low concentrations of a mixture of active ingredients making conventional pharmacokinetic parameters difficult to establish. It is thought that the activity of Traumeel® is explained by the concept of hormesis.

Hormesis is a dose–response phenomenon characterized by a U-shaped dose–response curve.<sup>18</sup> Hormesis characterizes the dose–response continuum as stimulatory at low and ultra-low doses and inhibitory at high doses, leading to the biphasic, hormetic dose–response curve.

Hormesis may be explained as a response to a disruption in homeostasis. At low levels of disruption or toxicity many biological systems display an over-compensation response, which results in the apparent low-dose stimulation component of the response curve. At higher doses, the system often displays a more limited capacity for a compensatory response, usually insufficient to return to control values.<sup>18</sup>

A number of pharmacologically based receptor systems that affect a broad range of crucial physiological and behavioral responses have been shown to display biphasic responses. These include receptor systems known to be involved in inflammatory pathways including bradykinin, nitric oxide, prostaglandin, TGF- $\beta$  and TNF- $\alpha$ .<sup>18</sup> In many instances, pharmacological systems have evolved highly efficient biological regulatory strategies in which the same endogenous agonist can elicit a stimulatory or inhibitory response depending on its concentration.

*In vitro* studies of the effects of Traumeel® on human leukocyte function have demonstrated an inverse dose response curve at dilutions of  $10^{-1}$ – $10^{-7}$  that is consistent with a hormetic dose–response curve.<sup>17</sup> Using human leukocytes and gut epithelial cells to investigate the secretion of the pro-inflammatory cytokines IL-1 $\beta$  and TNF- $\alpha$ , and the chemokine IL-8 in response to Traumeel® exposure at different concentrations, *Porozov et al* found that Traumeel® had an inhibitory effect in a unique dose-dependent fashion (see Figure 3, page 18).<sup>17</sup>

Therefore, it is thought that the optimal anti-inflammatory effect of Traumeel® requires exact concentrations of the active compounds. At dilutions that are too high or too low, Traumeel® would fail to exert an inhibitory effect on cytokine secretion.



The activity of Traumeel® can be explained by the concept of hormesis – a dose–response phenomenon characterized by a U-shaped dose-response curve.



It is thought that exact concentrations of the active compounds are required to achieve the optimal anti-inflammatory effect of Traumeel®.

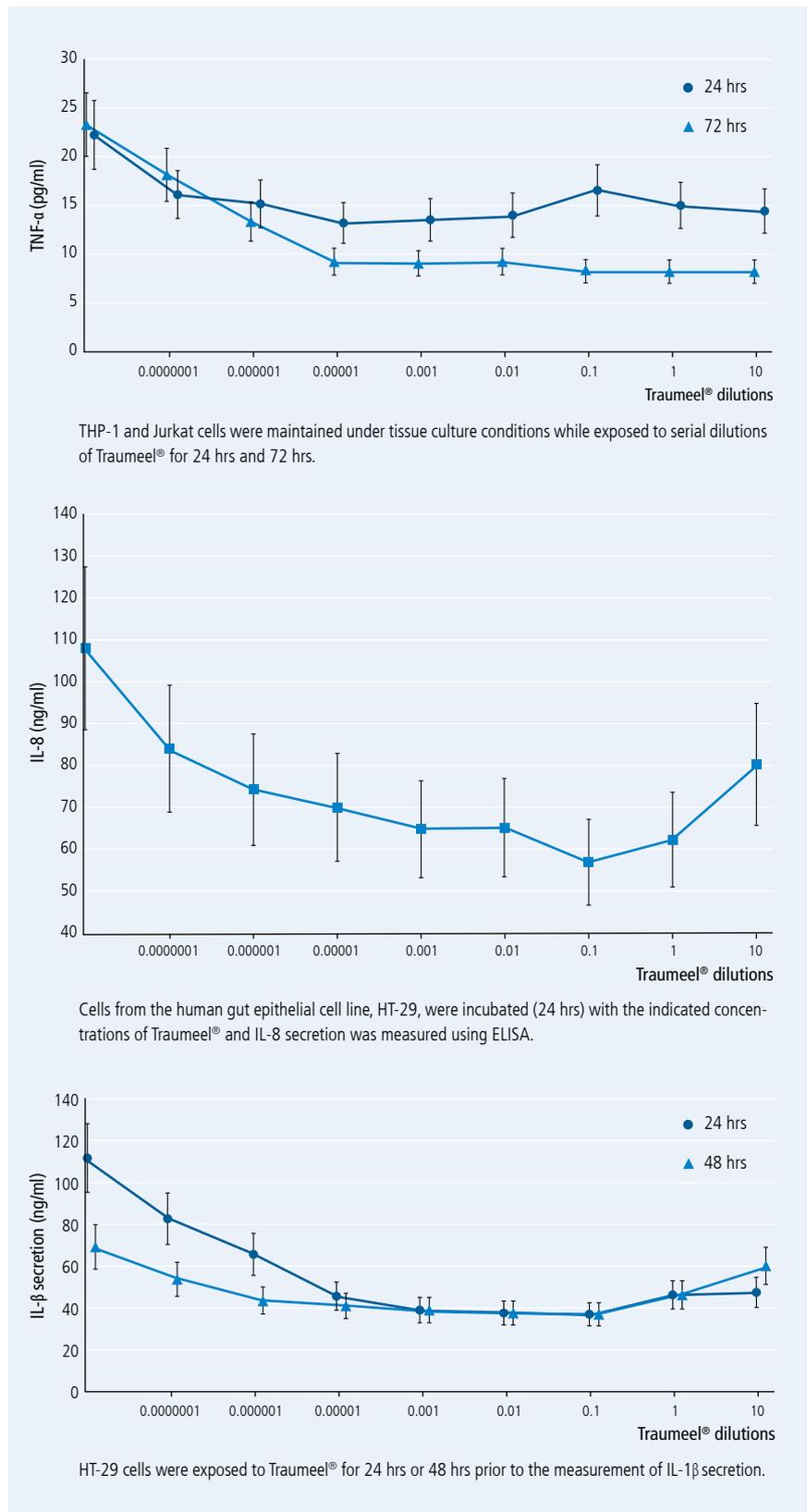


Figure 3. Effects of varying Traumeel® concentration on secretion of TNF-α (top), IL-8 (middle), and IL-1β (bottom). Each data point represents the mean ( $\pm$ SD) of triplicate ELISA wells.<sup>17</sup>

## 5 Clinical studies

### Randomized controlled clinical trials

#### Treatment of acute sprains of the ankle

Reference: Zell J, Connert WD, Mau J, Feuerstake G. Behandlung von akuten Sprunggelenksdistorsionen: Doppelblindstudie zum Wirksamkeitsnachweis eines homöopathischen Salbenpräparats. *Fortschr Med.* 1988;106(5):96–100. English translation available in *Biol Ther.*\*

**Study design:** randomized, placebo-controlled double-blind study.

**Formulation:** Traumeel® ointment.

**Indication(s):** activity-related ankle sprains.

#### Study design

- Patients with distortion of the articular-capsule ligaments (sprain) and of the tendons of the ankle were randomized to:
  - Traumeel® n=33: 25 male, 8 female; mean age 23; mean time from injury 10.8 hours
  - placebo n=36: 25 male, 11 female; mean age 22; mean time from injury 10.5 hours.
- Treatment was administered on an out-patient basis for 2 weeks – patients visited clinic on days 1, 3, 5, 8, 10, 12 and 15.
  - Both therapist and patients were blinded to medication.
  - All patients received electrotherapy as basic treatment.
  - Approximately 10–12 g of either Traumeel® or vehicle (placebo) was administered by applying a compression ointment bandage.

#### End points

- Primary end point: a pilot study identified the difference in total angulation of the joint – measured in extension and flexion between affected and non-affected joints – as a quantifiable objective measure for the degree of improvement in ankle mobility.
- Secondary end points:
  - the inversion angle (supination)
  - the degree of pain suffered upon movement measured on a 3-point scale with the score values of: 0=no pain; 1=mild pain; 2=severe pain.

\* Zell J, Connert WD, Mau J, Feuerstake G. Treatment of acute sprains of the ankle: a controlled double-blind trial to test the effectiveness of a homeopathic ointment. *Biol Ther.* 1989;VII(1):1–6.

## Results

- In both groups, the basic treatment produced an improvement in joint mobility. At day 10, the difference in total angulation of the joint between affected and non-affected joints was significantly less in Traumeel®-treated patients compared with placebo ( $p=0.015$ ) (see Figure 4).
- Treatment was defined as successful if the difference in the angular sums between injured and non-injured ankles decreased to  $\leq 10$  by day 10. The probability of successful treatment was significantly greater with Traumeel® than placebo ( $p=0.03$ ).
- A significantly greater proportion of Traumeel® patients had no pain upon movement on day 10 compared with placebo patients ( $p\leq 0.0003$ ) (see Figures 4 and 5).
- While more patients receiving Traumeel® than placebo achieved a difference in supination angle between injured and non-injured ankles of  $\leq 7$  at day 10, this did not achieve significance ( $p=0.13$ ) (see Figure 4).

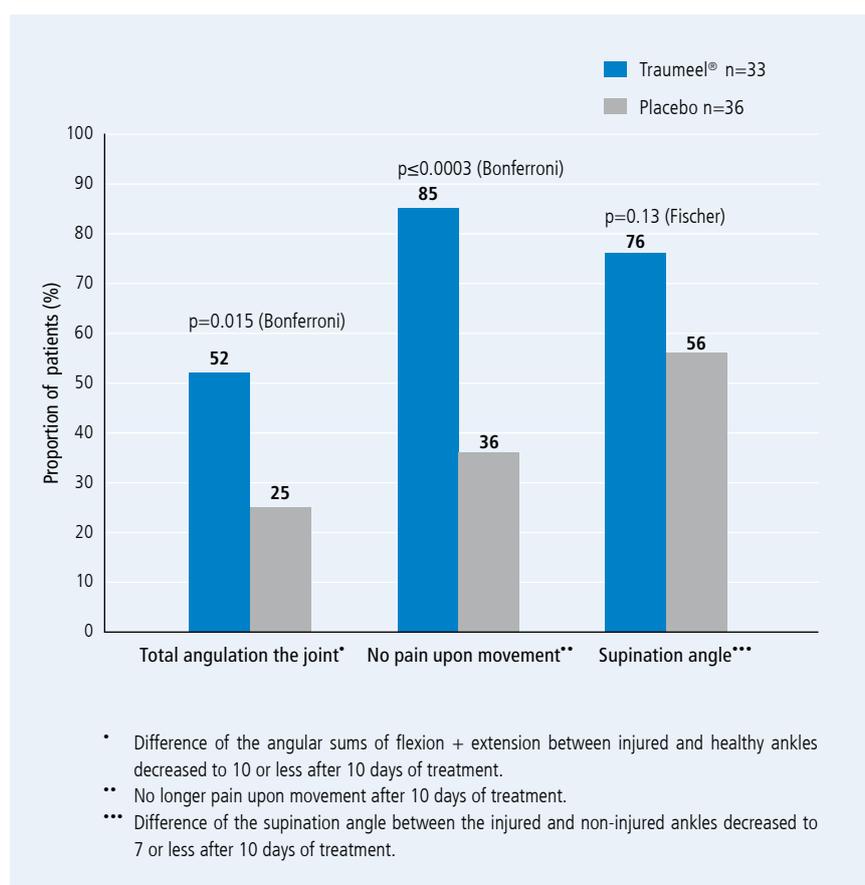


Figure 4. Proportion of patients achieving "success" in the different end points.

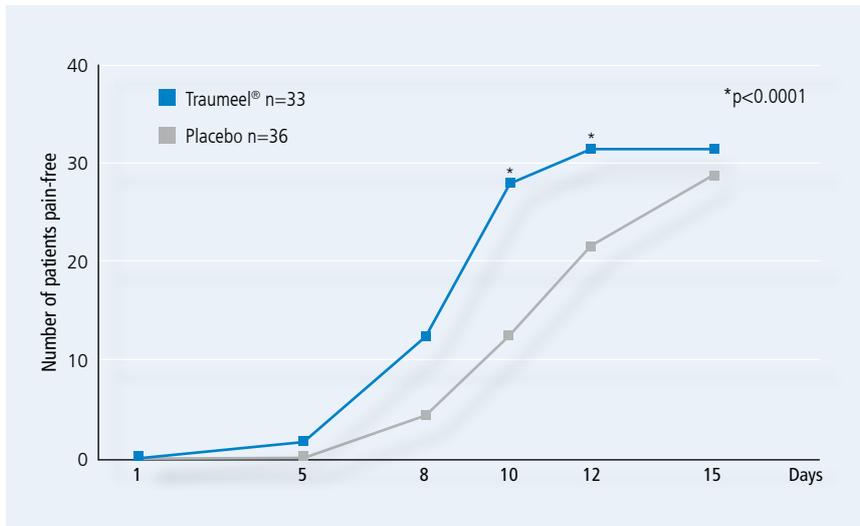


Figure 5. Patients with no pain upon movement within two weeks after beginning therapy with Traumeel® ointment.

### Conclusions

- Traumeel® is effective in the treatment of activity-related sprains of the ankle.
- Traumeel® improved ankle mobility and pain significantly.

## Treatment of acute musculoskeletal injuries

Reference: Böhmer D, Ambrus P. Treatment of sports injuries with Traumeel® ointment: a controlled double-blind study. *Biol Ther.* 1992;X(4):290–300.

**Study design:** randomized, placebo-controlled, double-blind study.

**Formulation:** Traumeel® ointment.

**Indication(s):** acute musculoskeletal injuries.

### Study design

- Patients with visible or palpable alteration in tissue, with injury as a consequence of sprain or contusion of a slight or moderate degree of severity, were randomized to receive:
  - Traumeel® n=34: 21 male, 13 female; mean age 31; 20 contusions, 14 sprains
  - placebo n=34: 23 male, 11 female; mean age 30; 11 contusions, 23 sprains.
- Patients received their first medication no later than on the fourth day after the injury (no other medication was given between injury and beginning of treatment).
- Following initial treatment, the patients applied 6–10 g of either Traumeel® or placebo ointment twice daily themselves, until day 15. An occlusive bandage was applied over the ointment for 30 minutes and the dressing covered with a cold compress while the injured extremity was rested.

### End points

- Primary end point: abatement of swelling assessed by measured circumference.
- Secondary end points:
  - maximum muscle force (difference between the injured body part and the contralateral uninjured side)
  - pain intensity measured on a 3-point scale (0=no pain, 1=slight pain, 2=severe pain) and summed for: at rest, in motion, and under pressure (range 0–6)
  - time until resumption of normal activity
  - overall evaluation of effectiveness by patient and physician (very good, good, moderate, poor).

## Results

- Swelling decreased more in the Traumeel® group than in the placebo group.
- By day 15, improvement in maximum muscle force was greater in the group receiving Traumeel® versus placebo (92% improvement versus 72%, see Figure 6).
- By day 15, pain was reduced by nearly 80% in the Traumeel® group and 63% in the placebo group ( $p < 0.001$ ) (see Figure 6).
- Normal activities were resumed earlier in patients receiving Traumeel® compared with placebo (mean 12.1 days versus 13.5 days, respectively).
- Treatment with Traumeel® was assessed as “very good” or “good” by 85% of patients and 74% of physicians, compared with 50% and 35% for placebo treatment, respectively. In no case was treatment with Traumeel® assessed as poor compared with 35% of physician’s assessments of placebo.
- At the end of the study, all patients and physicians evaluated the tolerance of both Traumeel® and placebo either as “good” or “very good”.
- No undesired side effects were observed during the course of the study.

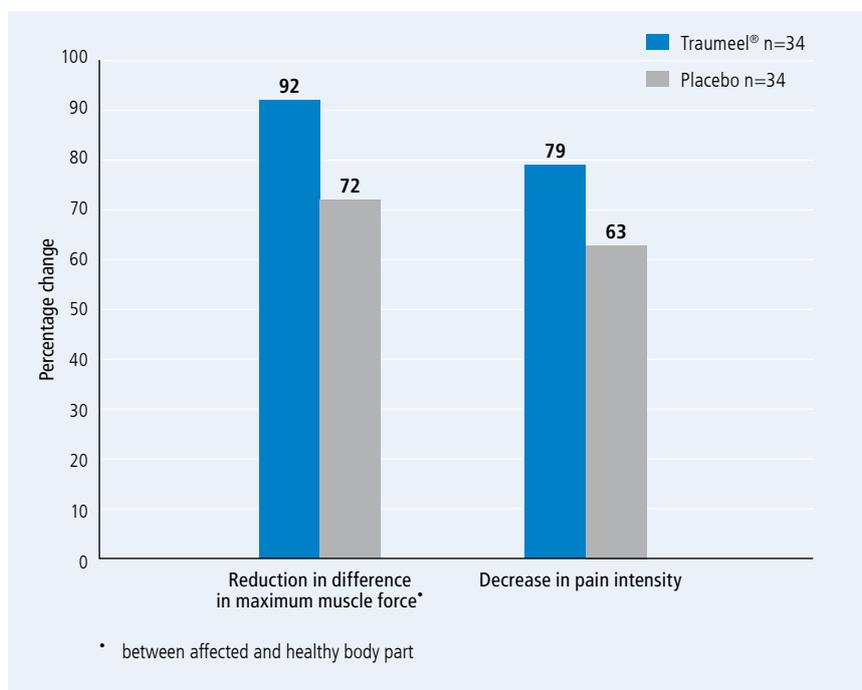


Figure 6. Changes in maximum muscle force and decrease in pain after 15 days of treatment in %.

## Conclusion

Traumeel® is significantly more effective than placebo in the treatment of acute musculoskeletal injuries.

## Traumeel® vs. diclofenac and placebo ointment in tendinous pain

Reference: Orizola AJ, Vargas F. The efficacy of Traumeel® versus diclofenac and placebo ointment in tendinous pain in elite athletes: a randomized controlled trial. *Med Sci Sports Med Exerc.* 2007;39(5 Suppl):S79, abstract 858.

**Study design:** randomized, double-blind, three-armed, parallel-group study.

**Formulation:** Traumeel® ointment.

**Indication(s):** various non-traumatic tendinopathies.

### Study design

- Elite athletes with various tendinopathies were randomized to receive:
  - Traumeel® n=89: 59 male, 30 female
  - diclofenac n=87: 60 male, 27 female
  - placebo n=76: 50 male, 26 female.
- Mean age of all participants was 23.5 years.
- Ointment was applied 4 times daily for at least 21 days.

### End points

- Echographic assessment at day 21 based on measurement of peritendinous diameter and edema.
- Pain measured on 10-point visual analog scale (VAS).
- Number of days until return to activity.
- Tolerability.

### Results

- Percentage reduction in the echographic assessment of the peritendinous diameter and edema was 88.2% with Traumeel®, 69.1% with diclofenac and 24.6% with placebo (p=0.001).
- Mean pain reduction with Traumeel® was 5.2 points versus 3.6 with diclofenac and 1.4 with placebo (p=0.001) (see Figure 7).

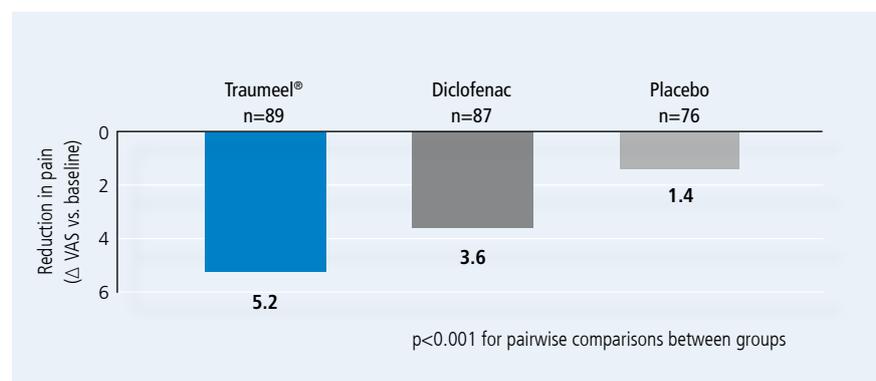


Figure 7. Change in VAS-P (mean pain reduction) recorded in elite athletes.

- Mean number of days until return to activity was 20.3 with Traumeel®, 24.6 with diclofenac and 30.6 with placebo ( $p=0.001$ ) (see Figure 8).
- All treatments were generally well-tolerated. Only four patients dropped out; all in the diclofenac group due to allergic skin reactions.

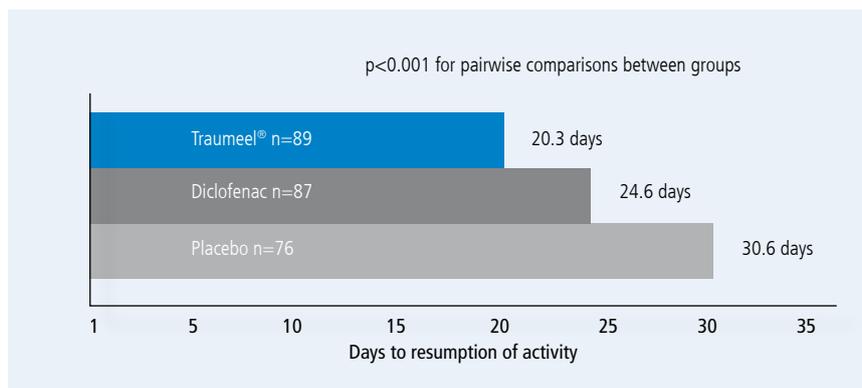


Figure 8. Average number of days to return to activity.

### Conclusion

Traumeel® ointment resulted in a significantly faster return to normal activity and a higher pain reduction over time compared with diclofenac ointment in the treatment of non-traumatic tendinopathies.

## The treatment of recent traumatic blood effusions of the knee joint

Reference: Thiel W, Borho B. Posttraumatische Kniegelenksergüsse und intraartikuläre Traumeel-N-Injektion. *Orthopädische Praxis*. 1991;11:721-725. English translation available in *Biol Ther*.\*

**Study design:** randomized, placebo-controlled double-blind trial.

**Formulation:** Traumeel® injection.\*\*

**Indication(s):** hemarthrosis of the knee.

### Study design

- Patients with acute, post-traumatic irritation of the knee joint with hemarthrosis (10–50 ml effusion) were randomized to receive:
  - Traumeel® n=37: 24 male, 13 female; mean age 36 years
  - physiological saline solution n=36; 24 male, 12 female; mean age 36 years.
- All patients were given an intra-articular injection on days 1, 4 and 8 with 2 ml injection solution after which a support dressing was applied. The observation period for each patient was 36 days.

### End points

- Extent of swelling by measuring circumference of knee joint.
- Mobility of injured and healthy joints.
- Pain at rest, on movement and under pressure measured using 3-point scale (0=none, 1=slight, 2=severe).
- Volume and nature of puncture fluid.

### Results

- After a single injection, only 13.5% of the patients in the Traumeel® group required further punctures, compared with 25% in the placebo group.
- On the 8th day after the start of treatment, the punctuate was still bloody in 5.4% of the Traumeel® group vs. 19.4% of the placebo group.
- Degree of movement was improved on day 8: 82.8% with Traumeel® vs. 56% with placebo.
- Swelling was reduced by 73.2% in the Traumeel® group and 51.3% in the placebo group.
- Success of treatment by day 8 is shown in Figure 9.
- Greater reductions in pain were seen in the Traumeel® group compared with the placebo group through day 8 (see Figure 10).
- By day 36, 95% of Traumeel® patients questioned had resumed normal activities compared with only 58% of placebo patients.

\* Thiel W, Borho B. The treatment of recent traumatic blood effusions of the knee joint. *Biol Ther*. 1994;XII(4):242–248.

\*\* The formulation used in this study was the same as the standard Traumeel® formulation with one additional ingredient.

- In all patients, treatment was tolerated without side effects or complications.

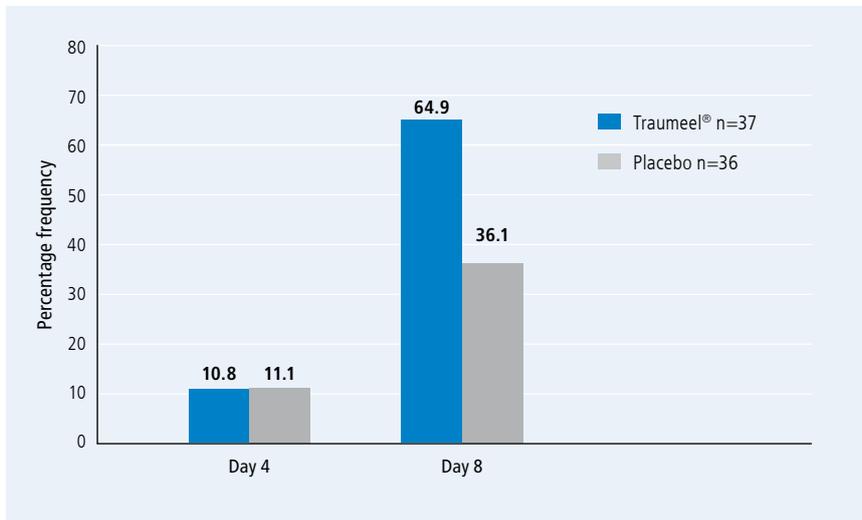


Figure 9. Success of treatment by day 8 (maximum difference in circumference of joint 0.5 cm and maximum difference in mobility 10 degrees between healthy and injured joints).

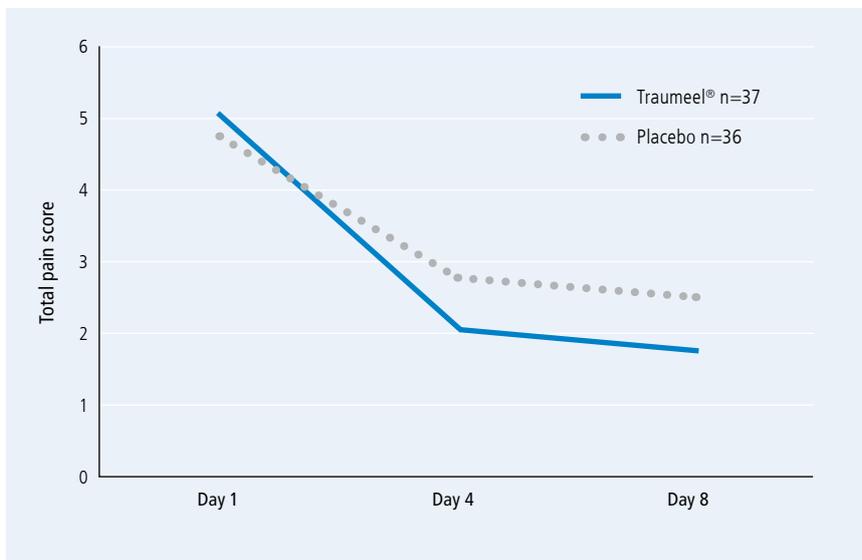


Figure 10. Mean values for total pain score on days 1, 4 and 8.

## Conclusion

This study shows that intra-articular injection therapy with Traumeel® produces fast regression of blood effusions of the knee.

*Note: The therapeutic process for treating recent traumatic blood effusions of the knee joint not involving any ligament or cartilage bone structures involves effusion (the escape of fluid) punctures in the area under sterile conditions to drain the hemarthrosis. During the puncture process, the joint may also be flushed using a neutral liquid, such as physiological saline solution, and this is usually followed by an intra-articular injection of an anti-inflammatory agent.*

## Non-randomized observational studies

### Traumeel® compared with conventional therapy in the treatment of injuries

Reference: Schneider C, Schneider B, Hanisch J, van Haselen R. The role of a homeopathic preparation compared with conventional therapy in the treatment of injuries: an observational cohort study. *Complement Ther Med*. 2008,16(1):22–27.

**Study design:** Multi-center, prospective, comparative observational cohort study.

**Formulation:** Traumeel® in various forms, e.g. tablets, ointment and injections.

**Indication(s):** various musculoskeletal injuries.

#### Study design

- Patients with various musculoskeletal injuries being treated by German physicians received:
  - Traumeel® as monotherapy or in combination with homeopathic products n=69: 39 male, 30 female; mean age 32.6 years; 67 acute injury, 2 chronic; additional measures taken in 20; co-medication taken by 4
  - conventional medicines n=64: 31 male, 33 female; mean age 31.6 years; 61 acute, 3 chronic injury; additional measures taken in 26; co-medication taken by 4.
- Additional measures (e.g. functional treatment, compression) and the use of co-medication were permitted and recorded.
- Traumeel® was used in more than one application form by 33% of Traumeel® group.
- Conventional medicines were: analgesics/anti-rheumatics 52%, anti-coagulants 16%, anti-inflammatory 7% and miscellaneous 25%; monotherapy in 69% and combination therapy in 31% of patients.

#### Outcome measures

- Primary: rate of resolution of the principal and secondary symptoms at the end of therapy.
- Secondary: time until symptomatic improvement and treatment outcome as assessed by the physician.

## Results

- The principal symptom (most commonly pain, then inflammation) had resolved completely at the end of therapy in 41 patients (59.4%) in the Traumeel® group vs. 37 patients (57.8%) in the conventional group (see Figure 11).

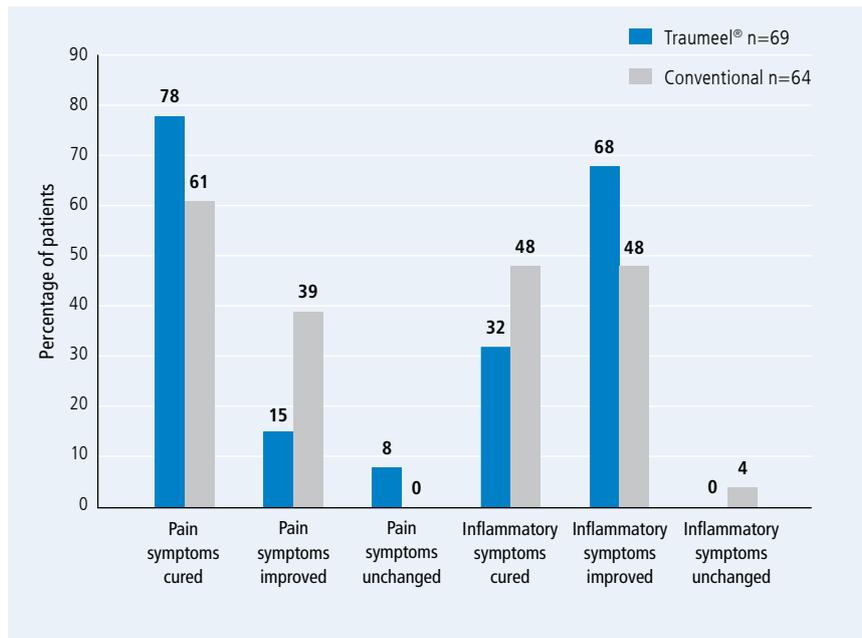


Figure 11. Changes in the principal symptoms of pain and inflammation at the end of the treatment period.

- Most patients showed improvement in the principal symptom within 4 days: 49 (71%) in the Traumeel® group and 31 (48%) in the conventional treatment group.
- Cox's proportional hazard regression analysis of the time until improvement shows a greater benefit with Traumeel®: unadjusted hazard ratio 0.95 (95% CI 0.67–1.37), adjusted (for diagnosis, symptoms, age, etc.) hazard ratio 0.94 (95% CI 0.56–1.37).
- Treatment compliance was judged to be good in both groups, but appeared to be better in patients receiving Traumeel®: compliance reported as “very good” in 72% of Traumeel® patients compared with 49% of conventionally treated patients.

## Conclusions

- Traumeel® is as effective as conventional medicines in the management of mild to moderate injuries/trauma.
- This study contributes to the evidence for the broad clinical effectiveness of Traumeel® in the treatment of acute injuries and trauma.

## Traumeel® compared with 1% diclofenac gel for acute symptomatic treatment of tendinopathy

Reference: Schneider C, Klein P, Stolt P, Oberbaum M. A homeopathic ointment preparation compared with 1% diclofenac gel for acute symptomatic treatment of tendinopathy. *Explore*. 2005;1(6):446–452.

**Study design:** non-randomized, observational study.

**Formulation:** Traumeel® ointment.

**Indication(s):** tendinopathies of varying etiologies.

### Study design

- Patients with tendinopathies of varying etiologies were treated with:
  - Traumeel® ointment n=122: 63 male, 59 female; mean age 47.8 years; tendinopathy affecting elbow 47, wrist 24, ankle 18, shoulder 16, knee 13
  - diclofenac 1% gel n=235: 108 male, 127 female; mean age 47.9 years; tendinopathy affecting elbow 77, wrist 46, ankle 39, shoulder 36, knee 24.
- Maximum duration of treatment 28 days.
- Traumeel® applied: with bandage 46.7%, twice daily 15.6%, three times daily 57.4%, 4 times daily 26.2%; number of daily applications reduced during course of treatment 19.7%.
- Diclofenac applied: with bandage 28.5%, twice daily 18.3%, three times daily 60.9%, four times daily 18.3%; number of daily applications reduced during course of treatment 10.6%.

### Outcome measures

- Efficacy variables: symptomatic changes (pain and mobility), severity of tendinopathy, time to first symptomatic improvement.
- Compliance (very high, high, moderate or low) and tolerability.

### Results

- The degrees of improvement in pain and mobility variables were highly similar between treatment groups.
- In most cases, symptoms started to improve after 3–7 days: lack of symptomatic improvement within 28 days was reported in 2.5% of Traumeel® group and 7.7% of diclofenac group.
- In global evaluation of therapies verdicts of “very good” or “good” were given in 88% of Traumeel® cases and 82% of diclofenac cases (p=0.09).

- Non-inferiority analysis showed that Traumeel® was non-inferior to diclofenac for all variables assessed. For most variables, differences trended toward favoring the Traumeel® group (see Figure 12). In particular, Traumeel showed greater benefits on mobility. However, as this study was designed to show non-inferiority and did not include a superiority hypothesis, the possibility of superiority of Traumeel over diclofenac on mobility variables could not be confirmed using these data.

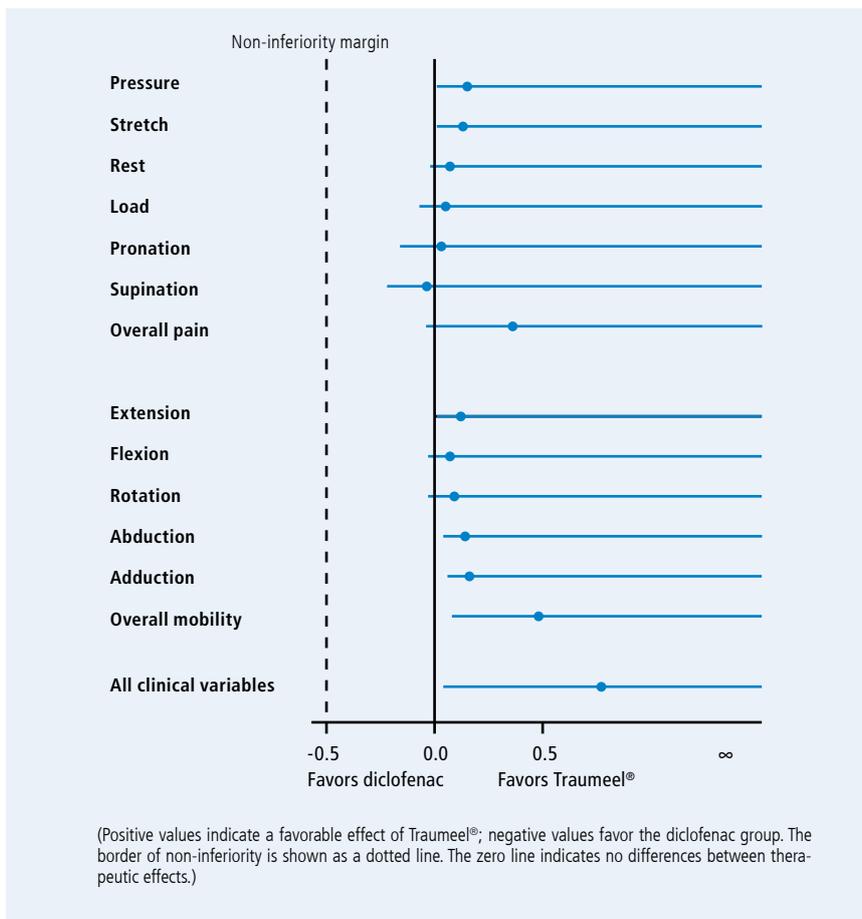


Figure 12. Point estimate and one-sided 95% confidence interval for the difference between scores for Traumeel® and control for all variables.

- Treatments were well-tolerated (“very good” was reported in 92.5% and 87.9% of Traumeel® and diclofenac patients, respectively), with no treatment-related adverse events. Compliance was “high” or “very high” in both treatment groups in >95% of cases.

### Conclusion

Traumeel® ointment is an effective and well-tolerated alternative to diclofenac 1% gel for the acute symptomatic treatment of patients with tendinopathy of varying etiology.

## Traumeel® compared with NSAIDs for symptomatic treatment of epicondylitis

Reference: Birnesser H, Oberbaum M, Klein P, Weiser M. The homeopathic preparation Traumeel® S compared with NSAIDs for symptomatic treatment of epicondylitis. *J Musculoskeletal Research*. 2004;8(2-3):119–128.

**Study design:** non-randomized, observational study.

**Formulation:** Traumeel® injection.

**Indication(s):** epicondylitis.

### Study design

- Patients with diagnosed epicondylitis were treated with:
  - Traumeel® injection (local infiltration) n=86: 40 male, 43 female; mean age 48.6 years
  - NSAIDs (unspecified, mainly diclofenac 51.9%) injection (systemic, mainly intramuscular) n=77: 40 male, 36 female; mean age 45.8 years.
- Other treatments were allowed, e.g. oral analgesics or physiotherapy, but while Traumeel® patients were allowed further injections, they were not allowed oral NSAIDs: 41.6% of the NSAID group received oral NSAIDs.
- Assessments conducted at weeks 1 and 2.

### Outcome measures

- Pain: local pressure pain, pain with movement, pain at rest. 5-point scale: 0=no pain, 1=light, 2=moderate, 3=strong, 4=severe.
- Mobility: extensional joint mobility, torsional joint mobility. 4-point scale: 1=normal, 2=lightly impaired, 3=moderately impaired, 4=heavily impaired.
- Global assessment of efficacy: time to first improvement, outcome of therapy (very successful, successful, moderate, unsuccessful), compliance (very high, high, moderate, low).

### Results

- Both treatments showed similar improvements in all five variables in the first week with no significant differences in time to onset of action.
- Traumeel® showed markedly greater improvements in the variables pain at rest ( $p<0.01$ ), change in extensional joint mobility ( $p<0.05$ ) and change in torsional joint mobility ( $p<0.01$ ) compared with NSAIDs, particularly in the second week of treatment ( $p$  values from non-inferiority analysis at end of week 2).

- Although the study was designed to assess non-inferiority, the analysis showed Traumeel® to be equivalent to NSAIDs on all variables and trended towards superiority on the variables pain at rest, extensional joint mobility and torsional joint mobility (see Figure 13).

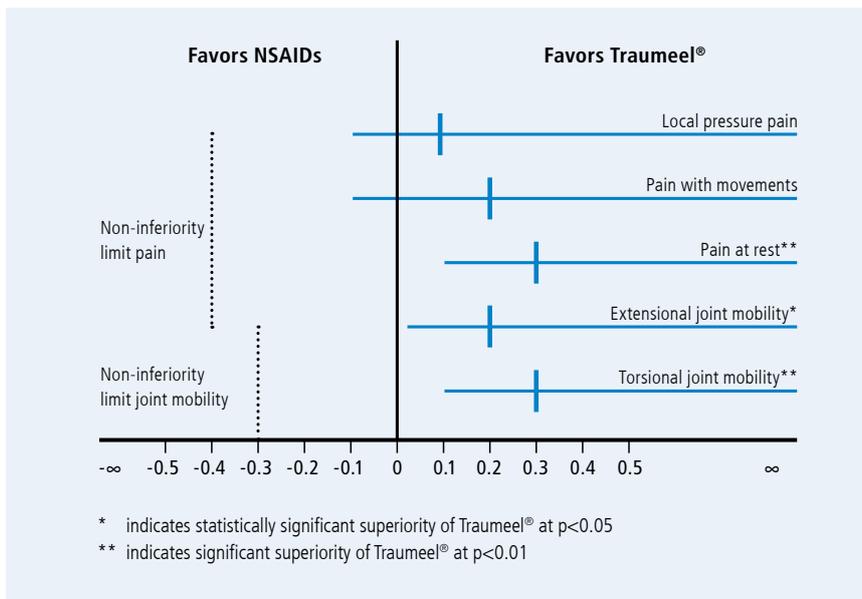


Figure 13. Mean difference with 97.5% confidence interval between symptom scores after two weeks for patients treated with NSAIDs (n=77) and Traumeel® (n=86).

- In global assessment, treatment was judged “very good” or “good” in 71% of Traumeel® patients compared with 44% of NSAID patients ( $p=0.013$ ).
- Compliance was reported as “very high” or “high” in 92% of Traumeel® patients compared with 81% of NSAID patients ( $p=0.11$ ).

### Conclusion

Traumeel® was at least equivalent to NSAID therapy in reducing pain and improving mobility in the early treatment of epicondylitis.

## Surveillance studies

### Drug surveillance for Traumeel® ointment

Reference: Zenner S, Metelmann H. Therapy experience with a homeopathic ointment: results of drug surveillance conducted on 3,422 patients. *Biol Ther.* 1994;XII(3):204–211.

**Study design:** multi-centric, post-marketing drug surveillance.

**Formulation:** Traumeel® ointment.

**Indication(s):** various traumatic, inflammatory, and degenerative disorders.

#### Study design

- 378 physicians completed surveys for patients in their care receiving Traumeel® ointment.
  - 3,422 patients: 47.7% male, 51.8% female; mean age 39.9 years.
- The most frequent complaint was sprains, followed in descending order of frequency by degenerative joint disease, hematoma, tenosynovitis, myogelosis, and contusion. Edema, epicondylitis, periarthritis of the shoulder and bursitis were also treated.
- Duration of symptoms was <1 week for 55% of patients, between 1 week and 1 month for 27%, and over 1 month for 18%.
- Traumeel® was the only treatment for 37.7% of patients: 31.3% received non-medical therapy (e.g. application of heat or cold, massage), 9.8% received additional medical therapy (half other preparations of Traumeel®), and 20.3% combined additional medical and non-medical therapy.
- Frequency of application: once daily 14.9%, twice daily 47.5%, three times daily 34.3%, every other day 1.9%.
- Mode of application: alone 48.1%, with dressing 45.0%, with iontophoresis 4.3%.
- Duration of treatment: <1 week 22.4%, 1 week to 1 month 63.6%, 1-3 months 9.8%, 3-6 months 1.6%, >6 months 1.4%.

#### Outcome measures

- Physician-rated therapy outcome: very good, good, satisfactory, unsuccessful, worsened.

#### Results

- The overall therapeutic results were graded mostly as “very good” (48.3%) or “good” (38.4%). Treatment was “unsuccessful” in only 2% of cases and only one case was reported as “worsening” (see Figure 14).



Figure 14. Results of therapy for patients with the biological medication Traumeel® ointment (n=3,422).

- Results were rated as “good” or “very good” in 98.9% of patients with hematoma, 97.0% contusion, 96.3% sprain, 93.2% edema, 92.1% bursitis, 88.1% tenosynovitis, 84.9% myogelosis, 80.4% epicondylitis, 71.6% periarthrititis of the shoulder and 54.3% degenerative joint disease.
- Ratings appear higher when Traumeel® was administered without concomitant therapies: 92.2% “good” or “very good” for monotherapy, 86.8% additional non-medical therapy, 86.6% additional medical therapy, and 76.9% additional medical and non-medical therapies.
- Traumeel® was well tolerated (see Clinical safety section, page 42).

### Conclusion

Traumeel® satisfies all pre-requisites for low-risk therapy of trauma and its sequelae of soft tissue swelling, as well as inflammatory degenerative processes – and processes associated with inflammation – as manifested in the musculoskeletal system.

## Drug surveillance for Traumeel® injection

Reference: Zenner S, Metelmann H. Application possibilities of Traumeel® S injection solution: results of a multicentric drug monitoring trial conducted on 3,241 patients. *Biol Ther.* 1992;X(4):301–310.

**Study design:** multi-centric, drug monitoring trial.

**Formulation:** Traumeel® injection.

**Indication(s):** various degenerative, traumatic and inflammatory affections.

### Study design

- 348 physicians completed surveys for patients in their care receiving Traumeel® ointment.
  - 3,241 patients: 49.1% male, 50.5% female; mean age 47.5 years.
- The most frequent complaint was forms of degenerative joint disease (primarily of the knee and hip), followed in descending order of frequency by myogelosis and sprains. Periathropatia humeroscapularis, epicondylitis and tendovaginitis were also treated.
- Duration of symptoms was <1 week for 33.9% of patients, between 1 week and 1 month for 31.0%, and over 1 month for 33.7%.
- Traumeel® was the only treatment for 19.2% of patients: 33.3% received non-medical therapy (e.g. application of heat or cold, massage), 14.9% received additional medical therapy (which could include other preparations of Traumeel®), and 31.1% combined additional medical and non-medical therapy.
- Frequency of application: daily 15.2%, 3 times a week 27.7%, twice weekly 40.1%, once weekly 13.6%.
- Manner of application: intramuscular 24.0%, subcutaneous 17.8%, peri-articular 14.6%, intra-articular 10.6%, peritendineal 7.0%, intravenous 4.3%, intracutaneous 2.8%, other 18.6%.
- Duration of treatment: <1 week 15.9%, 1 week to 1 month 62.7%, 1-3 months 15.2%, 3-6 months 3.2%, >6 months 2.1%.

### Outcome measures

- Physician-rated therapy outcome: very good, good, satisfactory, unsuccessful, worsened.

### Results

- The overall therapeutic results were graded as “very good” or “good” in 78.6% of cases. Treatment was “unsuccessful” in only 3.5% of cases and only five cases (0.1%) were reported as “worsening” (see Figure 15).

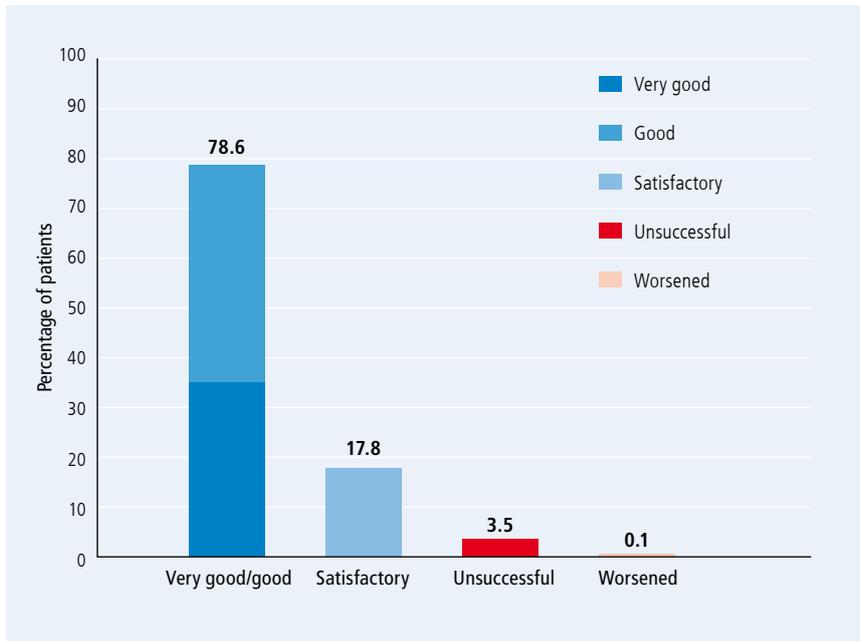


Figure 15. Results of therapy among patients treated with Traumeel® injection (n=3,421).

- Results were rated as “good” or “very good” in 95.0% of patients with sprains, 86.9% tendovaginitis, 80.1% myogelosis, 78.6% epicondylitis, 74.8% periathropathia humeroscapularis and 59.5% degenerative joint disease.
- Ratings appear higher when Traumeel® was administered without concomitant therapies: 85.2% “good” or “very good” for monotherapy, 79.6% additional non-medical therapy, 82.8% additional medical therapy, and 71.7% additional medical and non-medical therapies.
- The fraction of “good” or “very good” results was greater with shorter administration intervals between injections than for applications with longer time periods between injections; e.g. daily application resulted as “good” and “very good” comments in 90.1%, weekly application only in 68.2%.
- Traumeel® was well tolerated (see Clinical safety section, see page 42).

### Conclusion

Traumeel® injection solution is effective for therapy of post-traumatic conditions (sprains), as well as inflammatory and degenerative processes affecting the musculoskeletal system.

## Drug surveillance for Traumeel® oral treatment

Reference: Zenner S, Weiser M. Oral treatment of traumatic, inflammatory, and degenerative conditions with a homeopathic remedy. *Biol Ther.* 1997;XV(1):22–26.

**Study design:** multi-center, prospective study.

**Formulation:** Traumeel® tablets and drops.

**Indication(s):** musculoskeletal injuries, inflammatory and degenerative joint conditions.

### Study design

- 138 physicians completed surveys for patients in their care receiving Traumeel® tablets or drops.
  - 1,359 patients: 45.3% male, 54.6% female; age <21 12.8%, 21–40 35.2%, 41–60 32.5%, 61–80 16.6% and >80 2.8%.
- The most frequent complaint was bruises, followed in descending order of frequency by sprains, degenerative joint disease, hematomas, carpal tunnel syndrome, frozen shoulder, post-traumatic edema, epicondylitis, and post-operative edema. Joint effusion, dislocations, concussion and bursitis were also treated.
- Duration of symptoms was <1 week for approximately 50% of patients, between 1 week and 1 month for approximately 25%, and over 1 month for about 10%.
- Traumeel® was supplemented with drug or non-drug therapies in approximately two thirds of patients; most frequently with analgesics, anti-inflammatories and medications for circulatory disorders as concomitant drug therapy and application of ice, electrotherapy and physical therapy as concomitant non-drug therapies.
- Mode of application: tablets 69%, drops 29%, both forms 2%.
- Frequency of application: drops – 94% between 5 drops 5 times daily and 30 drops 6 times daily; tablets – 74% 1 tablet 3 times daily.
- Duration of treatment: ≤1 week 23%, 1–2 weeks 27%, 2–3 weeks 22%, 4–5 weeks 14%, 6–8 weeks 6%, >8 weeks 8%.

### Outcome measures

- Time when symptoms began to improve.
- Physician-rated therapy outcome: very good, good, satisfactory, unsuccessful, worsened.

### Results

- Improvement in symptoms occurred in the first week for about half of patients, 34% within 1–3 weeks and 8% in >4weeks; no improvement noted in 4%.

- In 83% of all cases, therapeutic results were rated as “good” or “very good”. In 13%, treatment was rated as “satisfactory”, while in 4% it was “unsuccessful”.
- There was no difference in the results of treatment with the two different oral forms of the medication.
- Results appeared slightly better in patients receiving Traumeel® alone (“very good” 48.6%) compared with patients receiving concomitant therapy (“very good” 33.7%).
- As may be expected, success rates were high in acute conditions rather than chronic conditions, although even in chronic conditions positive therapeutic results were achieved in the majority of cases.
- Both oral forms of Traumeel® were well tolerated and no adverse reactions were observed (see Figure 16).

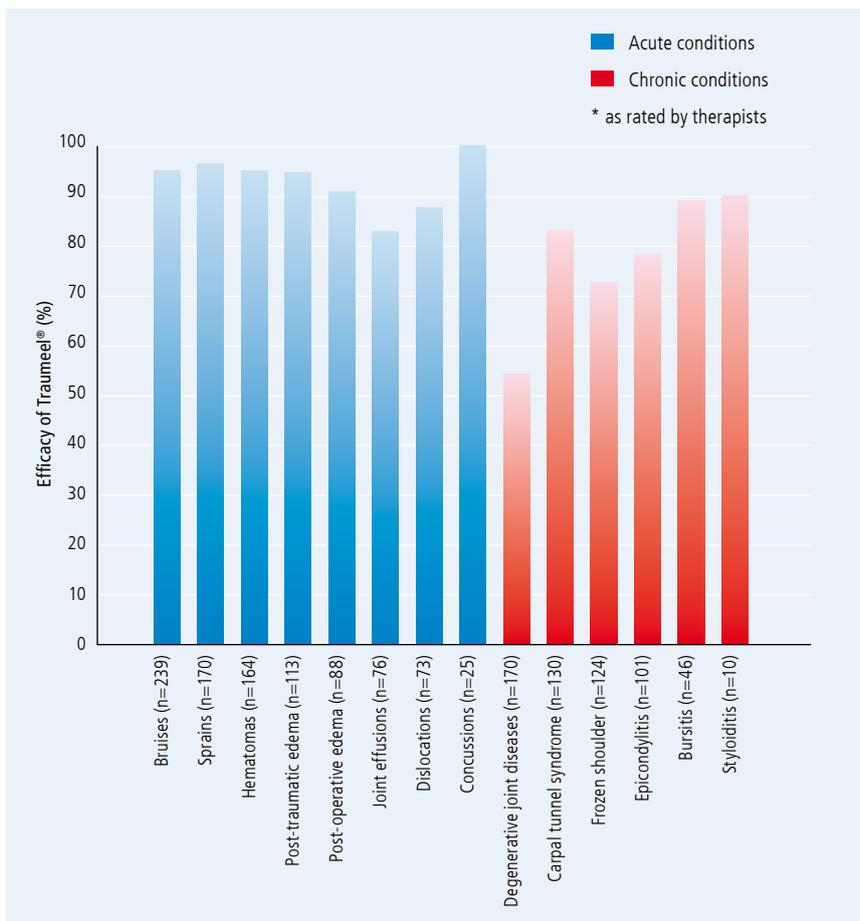


Figure 16. Good to very good efficacy of Traumeel®, in %\*.

## Conclusion

Both orally administered forms of Traumeel® are suitable for treating acute post-traumatic conditions, inflammatory and inflammation-related symptoms.

## Pediatric studies

### Efficacy of Traumeel® in children with musculoskeletal injury

Reference: Ludwig J, Weiser M. Treating pediatric trauma with a homeopathic ointment. *J Biomed Ther.* 2001; Summer: 8–11.

**Study design:** observational study.

**Formulation:** Traumeel® ointment.

**Indication(s):** acute musculoskeletal injury.

#### Study design

- Data on children receiving Traumeel® ointment was recorded on standardized questionnaires by 32 pediatricians.
  - n=157: 87 male, 70 female; median age 10, range 0–12.
- Traumeel® was most frequently prescribed for contusions (31.8%), sprains (23.6%), hematomas (16.6%) and dislocations (7.0%). Other uses of Traumeel® included joint effusions, tenosynovitis, fractures, and epicondylitis.
- The majority of patients (80%) had symptoms for <1 week before treatment.
- Traumeel® was applied 1–3 times daily with or without bandaging in 84% of cases.
- Traumeel® was used as monotherapy in 62%, while 38% received adjunct therapies, either pharmaceutical (e.g. analgesics or anti-inflammatories) or non-pharmaceutical (e.g. hot/cold packs or massage).
- Duration of treatment: 1 week in two thirds of patients.

#### Outcome measures

- Time when symptoms began to improve.
- Physician-rated therapy outcome: very good, good, satisfactory, no improvement, worse.

#### Results

- Overall analysis of the therapeutic results indicated that the treatment was rated (regardless of age or type of symptoms) as “very good” in 70% of patients and “good” in 27% of patients (see Figure 17).

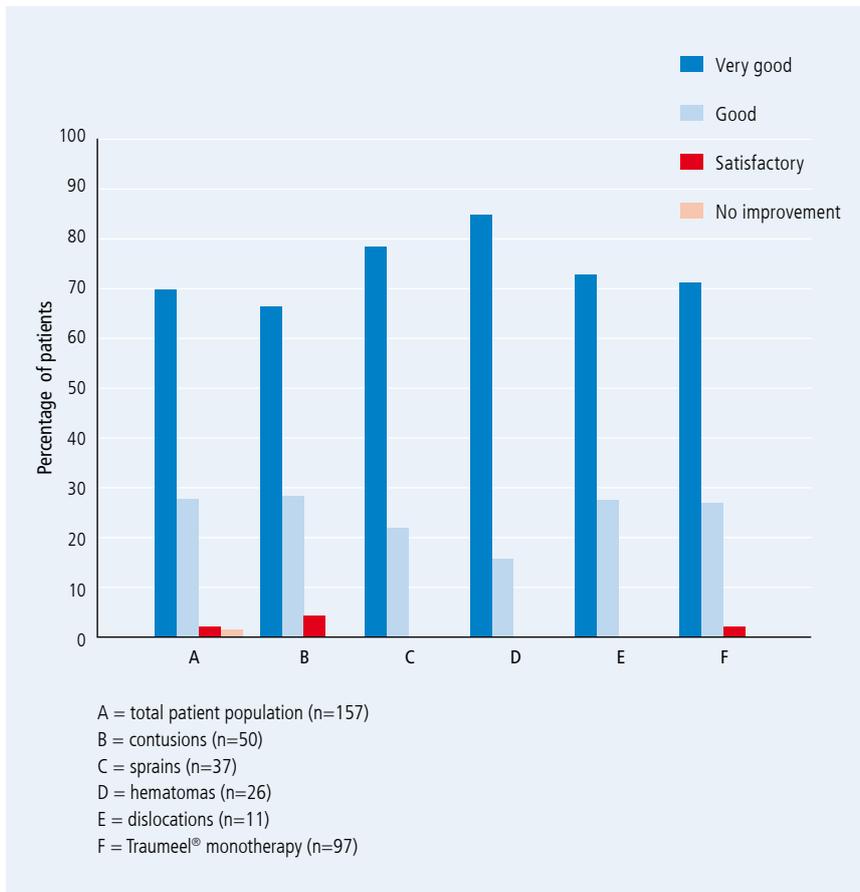


Figure 17. Results of therapy with Traumeel®.

- Monotherapy with Traumeel® was rated as “very good” or “good” in 98% of patients.
- Symptoms improved within 1 day of application in 7% of patients, and within 1–3 days in two thirds of the patients. A further 24% saw improvement by the end of the first week of treatment.

### Conclusions

- Traumeel® proved effective in all pediatric age groups (infants, pre-schoolers and school-age children) and for all of the usage indications reported.
- Traumeel® is reliably effective in treating both blunt trauma and muscle, joint and soft-tissue disorders of varying etiology in pediatric patients.

## 6 Clinical safety

### ***In vitro* studies**

When the possible effects of Traumeel® on the functions of neutrophil cells were tested *in vitro*, it was observed that Traumeel® did not affect functions of neutrophils such as superoxide anion production and adhesion.<sup>16</sup> The lack of any affect on neutrophil functions indicates that Traumeel® is unlikely to interfere with antimicrobial first defenses. At least one of these neutrophil functions are inhibited by many conventional anti-inflammatory and analgesic compounds.



In a four-week safety study Traumeel® demonstrated no significant effect on any of the laboratory parameters measured.

Furthermore, when investigating the adhesion of human platelets to fibrinogen-coated surfaces, Traumeel® did not affect platelet adhesion stimulated by two natural agonists (ADP and thrombin).<sup>16</sup> As inflammatory and homeostatic events are interlinked and platelets are involved in inflammatory reactions, the lack of any impact of Traumeel® on platelet function is of interest. Importantly, the normal homeostatic process is unlikely to be affected by Traumeel®, which suggests it could be used in patients at risk of hemorrhagic events.

### **Clinical studies in adults**

#### **Safety**

In a four-week study, 20 healthy volunteers (aged 18–75 years) received two Traumeel® oral tablets sublingually, three times a day.<sup>19</sup> Laboratory tests were performed once a week to assess the effect of Traumeel® on complete blood count, liver profile, serum chemistry, bleeding time, coagulation time and the gastrointestinal system.

The results showed that there was no significant effect from baseline to study completion on any measured laboratory parameter. All subjects' vital signs remained stable throughout the study. No significant changes in hematological parameters, including hematocrit, and platelet and neutrophil counts were observed. Laboratory indicators of kidney and liver function remained unchanged, and no significant differences in prothrombin time or partial thromboplastin time were detected from baseline to post treatment. When stool samples were analyzed for occult blood, as an indicator of gastrointestinal toxicity, all results were negative for all subjects throughout the study.<sup>19</sup>

A total of 11 subjects reported 36 adverse events after taking Traumeel®:<sup>19</sup>

- Headache was the most commonly reported adverse event (n=15)
- Other common events included diarrhea and stomach discomfort/bloating (n=6), and feelings of nausea (n=2)
- All events were considered to be mild (n=30; 83.3%) or moderate (n=6; 16.7%) in severity
- No events required Traumeel® to be stopped; all were transient and resolved despite continuation of the study drug
- No adverse event was considered probably or definitely related to ingestion of the study medication
- No severe toxic events were observed and there was no evidence of gastrointestinal bleeding.

While it should be noted that this was not a placebo-controlled study, it was concluded that Traumeel® is safe and well-tolerated in healthy subjects. The authors suggest that Traumeel® should be considered as a safer alternative to NSAIDs, particularly in patients with conditions, or receiving medications, that affect normal coagulation.<sup>19</sup>

“Traumeel® has anti-inflammatory and analgesic effects and does not inhibit the arachidonic acid pathway of prostaglandin synthesis. Traumeel® deserves consideration as a safer alternative for patients at high risk of gastrointestinal bleeding with conventional NSAIDs.”<sup>19</sup>



Traumeel® is better tolerated and has less side effects than NSAIDs, particularly in patients that may be at risk of excessive bleeding.

## Tolerability

Post-marketing drug surveillance has shown that tolerability of Traumeel® is good to very good.<sup>20,21</sup>

In 3,467 cases treated with Traumeel® injection there were only 19 reports of undesired effects in conjunction with administration of the medication: 8 cases of local reddening at the site of injection, 1 case of brief local muscle pain, 3 cases of transient irritation of the knee joint, 1 case of pain at the injection site with no further signs of local irritation, 3 cases of a heat sensation at the site of injection, 1 case of circulatory insufficiency, 1 case of general malaise and 1 case of fatigue.<sup>20</sup>

In 3,446 cases treated with Traumeel® cream there were only 13 reports of undesired effects that were chronologically associated with topical cream administration.<sup>21</sup> These were local skin irritation and allergic reactions to the medication evidenced by redness of the skin and/or itching. While most reactions were minor and of brief duration, 3 patients experienced more severe reactions and symptoms were relieved on cessation of treatment. Due



In observational studies the tolerability of Traumeel® was significantly greater than conventional treatment in the management of musculoskeletal injury.

to the use of other medicinal preparations in these patients, a causal relationship between Traumeel® and these side effects cannot be verified.

Observational studies comparing Traumeel® with conventional treatments for musculoskeletal injury show that the tolerability of Traumeel® is significantly greater compared with conventional treatment.<sup>22,23</sup>

In an observational, non-randomized study comparing Traumeel® injection (n=106) with NSAID injection (n=78; mainly diclofenac) in 184 patients with diagnosed epicondylitis over 2 weeks, both treatments were well tolerated.<sup>22</sup> However, a significantly greater proportion of patients receiving Traumeel® reported “very good” tolerability compared with those receiving NSAIDs (88% versus 45%, respectively). Indeed, only three adverse events were reported during the study, all in the NSAID group.

A prospective, observational cohort study compared 69 patients treated with Traumeel® with 64 conventionally treated patients with various musculoskeletal injuries followed over a maximum of 3 months.<sup>23</sup> Tolerability was judged by physicians to be “very good” in a significantly greater proportion of patients receiving Traumeel® compared with conventional treatment (90% versus 50%; p=0.001). Furthermore, there were no adverse events reported in the Traumeel® group, while 6 adverse events were reported with conventional therapy.

### Safety in children

Data in children are limited to one study conducted in 157 children aged 0–12 years, median age 10 years.<sup>24</sup> The use of Traumeel® ointment was rated as having “excellent” or “good” tolerability in all patients by reporting pediatricians. No adverse effects were reported from the use of Traumeel® ointment.

### Reported adverse effects

Adverse effects with Traumeel® are extremely rare. Traumeel® exhibits no known adverse renal, hepatic, cardiovascular, gastrointestinal or central nervous system effects.

Hypersensitivity reactions can occur in individual cases. Patients with hypersensitivity to any of Traumeel®'s ingredients may, in rare instances, experience an allergic reaction after the administration of Traumeel®.

Skin rash and pruritus and, in rare cases, facial swelling, dyspnea, dizziness and a fall in blood pressure have been observed after treatment with products containing *Echinacea* extracts.

## Drug interactions

Traumeel® is not known to interact with any other medications or with any laboratory tests.

Systemic use of Traumeel®, via either oral or parenteral administration, can be safely augmented by the application of Traumeel® in a topical dosage form.



No interactions with other medications have been observed following use of Traumeel®.

## Contraindications

Hypersensitivity to Traumeel® or any of its ingredients.

## Pregnancy and lactation

Animal reproduction studies have not been performed and the effects of Traumeel® on the unborn fetus are unknown. In pregnancy or suspected pregnancy, Traumeel® should only be used if, in the judgment of the treating physician, the potential benefits outweigh the potential risks to the fetus.

It is not known whether any of the ingredients in Traumeel® are excreted in human milk. Consequently, Traumeel® should be administered with caution to nursing mothers under the close supervision of a physician.

## Long-term safety

There is no evidence of tachyphylaxis or addiction following the long-term use of Traumeel®.

No studies have been performed to evaluate the carcinogenicity of Traumeel®, however, in worldwide post-marketing surveillance studies, no evidence of carcinogenicity has been found.<sup>25</sup>

## 7 Use in clinical practice



Traumeel® can be considered as a first-line treatment for patients with blunt injuries.

### Place in therapy

#### For patients

Traumeel® is a first-line treatment for patients with blunt injuries. While it is suitable for most patients, it may be particularly suitable for patients who are unable or unwilling to tolerate NSAIDs.

#### Contraindications to diclofenac<sup>26</sup>

- Hypersensitivity to the active substance or any of the excipients
- Patients who have previously shown hypersensitivity reactions (e.g. asthma, angioedema, urticaria or acute rhinitis) to ibuprofen, aspirin or other NSAIDs
- Patients with a history of, or active, gastrointestinal ulcers, bleeding or perforation (two or more distinct episodes of proven ulceration or bleeding)
- Severe hepatic, renal and heart failure
- During the last trimester of pregnancy
- History of gastrointestinal bleeding or perforation, relating to previous NSAID therapy
- Acute porphyria

#### Patient groups and conditions in which diclofenac should be used with caution<sup>26</sup>

- The elderly
- Gastrointestinal disorders including history of ulceration, or inflammatory bowel disease
- Hepatic impairment\*
- Respiratory conditions including asthma, seasonal allergic rhinitis, nasal polyps, chronic obstructive pulmonary diseases or chronic infection of the respiratory tract
- Renal impairment
- Cardiac impairment
- Hypertension
- Defects of hemostasis, bleeding diathesis or hematologic abnormalities
- Increased cardiovascular risk, including established ischemic heart disease, peripheral arterial disease or cerebrovascular disease, also with risk factors including hypertension, hyperlipidemia, diabetes mellitus, smoking
- Systemic lupus erythematosus and mixed connective tissue disorders
- Women attempting to conceive (may impair fertility)

Drugs diclofenac can interact with<sup>26</sup>

Lithium, anticoagulants, antidiabetic agents, ciclosporin, tacrolimus, methotrexate, quinolone antimicrobials, other NSAIDs including COX-2 selective inhibitors, corticosteroids, antiplatelet agents, selective serotonin reuptake inhibitors (SSRIs), diuretics, antihypertensives, cardiac glycosides, mifepristone, baclofen, drospirenone, ketorolac, penicillamine, erlotinib, iloprost, pentoxifylline, sibutramine, venlafaxine, phenytoin, ritonavir, zidovudine

In observational cohort studies Traumeel® has shown significantly better tolerance compared with NSAIDs.<sup>22,23</sup> Post-marketing drug surveillance has shown that adverse reactions to Traumeel® are uncommon and largely limited to mild local reactions at the site of administration.<sup>20,21</sup>



Traumeel® has demonstrated improved tolerability compared with NSAIDs.

### For healthcare professionals

You may be most interested in using Traumeel® in your patients if you are a:

- General practitioner/family practitioner
- Orthopedic surgeon (orthopedist)
- Rheumatologist
- Physician with sports medicine training
- Pharmacist
- Physician with patients unable to take NSAIDs.

Alternatively, you may have patients who are interested in using Traumeel®.

\* The Food and Drug Administration (FDA) issued a warning concerning the potential for elevation in liver function tests during treatment with all products (including topical formulations) containing diclofenac sodium. In post-marketing reports, cases of drug-induced hepatotoxicity have been reported in the first month but can occur at any time during treatment with diclofenac.<sup>11</sup>



Traumeel® is available in a range of formulations to maximize convenience and flexibility.

## Traumeel® formulations and dosing recommendations

Traumeel® is available in a variety of formulations for flexibility of use and to maximize patient convenience and compliance. It can be obtained in:

- Ointment or gel for topical application
- Oral tablets
- Ampoules of solution for injection.

Medication names, indications and formulas may vary from country to country; package inserts provide country-specific information.

### Dosage

**Tablets:** In general, 1 tablet to be dissolved in the mouth 3 times daily.

**Injection solution:** In acute disorders daily, otherwise 1–3 times weekly, 1–2 ampoules can be injected intramuscularly, subcutaneously, intravenously, intradermally or periarticularly.

**Ointment:** Apply to the affected parts and rub in 3 times daily, or if necessary more often, possibly also applying an ointment dressing.

Note: Do not apply the ointment to large areas for a longer time or directly into open wounds.

**Gel:** Apply to the affected parts 1-2 times daily, or if necessary, more often.

### Pharmaceutical particulars

#### Storage

Products should not be frozen or exposed to excessive heat. See packaging instructions for specific storage recommendations of each Traumeel® formulation.

#### Ingredients

**Tablets:** 1 tablet containing: Arnica montana D2, Calendula officinalis D2, Hamamelis virginiana D2, Achillea millefolium D3 15 mg each; Atropa belladonna D4 75 mg; Aconitum napellus D3, Mercurius solubilis Hahnemanni D8, Hepar sulfuris D8 30 mg each; Matricaria recutita D3, Symphytum officinale D8 24 mg each; Bellis perennis D2, Echinacea D2, Echinacea purpurea D2 6 mg each; Hypericum perforatum D2 3 mg.

**Injection solution:** 2.2 ml containing: Arnica montana D2, Calendula officinalis D2, Chamomilla recutita D3, Symphytum officinale D6, Achillea millefolium D3, Atropa belladonna D2 2.2 mg each; Aconitum napellus D2 1.32 mg; Bellis perennis D2 1.1 mg; Hypericum perforatum D2 0.66 mg; Echinacea D2, Echinacea purpurea D2 0.55 mg each; Hamamelis virginiana D1 0.22 mg; Mercurius solubilis Hahnemanni D6 1.1 mg, Hepar sulfuris D6 2.2 mg.

**Ointment:** 100 g containing: Arnica montana D3 1.5 g; Calendula officinalis Ø, Hamamelis virginiana Ø 0.45 g each; Echinacea Ø, Echinacea purpurea Ø, Matricaria recutita Ø 0.15 g each; Symphytum officinale D4, Bellis perennis Ø 0.1 g each; Hypericum perforatum D6, Achillea millefolium Ø 0.09 g each; Aconitum napellus D1, Atropa belladonna D1 0.05 g each; Mercurius solubilis Hahnemanni D6 0.04 g; Hepar sulfuris D6 0.025 g.

Excipients: Paraffinum liquidum, cetostearyl alcohol (type A), emulsifying, white soft paraffin, purified water, ethanol, preserved with 13.8 vol.-% ethanol.

**Gel:** 10 g containing: Arnica montana D3 0.15 g; Calendula officinalis Ø, Hamamelis virginiana Ø 0.045 g each; Echinacea angustifolia Ø, Echinacea purpurea Ø, Chamomilla recutita Ø 0.015 g each; Symphytum officinale D4, Bellis perennis Ø 0.01 g each; Hypericum perforatum D6, Achillea millefolium Ø 0.009 g each; Aconitum napellus D1, Atropa belladonna D1 0.005 g each; Mercurius solubilis Hahnemanni D6 0.004 g; Hepar sulfuris D6 0.0025 g. Excipients: Carbomers, purified water, sodium hydroxide solution, ethanol. Contains 25 vol.-% alcohol.

Ø = undiluted, i.e. the so-called 'mother tincture'.

## Packaging

**Tablets:** Packs containing 50 and 250 tablets.

**Injection solution:** Packs containing 10 and 100 ampoules of 2.2 ml each.

**Ointment:** Tubes containing 50 and 100 g ointment.

**Gel:** Tubes containing 50 and 100 g of gel.

## 8 Summary

- Traumeel® has been used in more than 50 countries around the world for over 60 years, having reached millions of patients with a usage of over 8 million packages a year, of which more than half are ointment and gel.
- Traumeel® is indicated as a first-line treatment for patients with blunt injuries, such as sprains, dislocations, contusions, hemarthrosis and effusions into a joint.
- Traumeel® contains 14 components from natural sources to cover the different aspects of the inflammatory phenomenon.
- The components of Traumeel® act synergistically to accelerate the healing process.
- Traumeel® has a different mechanism of action to conventional anti-inflammatory drugs.
- Traumeel® appears to work through complex interactions with the cytokine network, which regulates inflammatory responses.
- Randomized controlled studies have shown that Traumeel® is more effective than placebo while observational cohort studies have shown Traumeel® to be at least comparable with conventional therapies for the treatment of acute musculoskeletal injury.
- Post-marketing surveillance has demonstrated very good tolerability for Traumeel® formulations with very few adverse effects observed.
- Tolerability of Traumeel® has been demonstrated to be significantly greater than with conventional treatments.
- Traumeel® is suitable for most patients requiring first-line treatment for acute musculoskeletal injury and inflammation.
- Traumeel® may be particularly suitable for patients who are unable or unwilling to tolerate conventional anti-inflammatory medication, or for those in whom such treatment is contraindicated.

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## 10 Appendix

### Traumeel®: Tablets • Injection solution • Ointment

**Compositions: Tablets:** 1 tablet containing: Arnica montana D2, Calendula officinalis D2, Hamamelis virginiana D2, Achillea millefolium D3 15 mg each; Atropa belladonna D4 75 mg; Aconitum napellus D3, Mercurius solubilis Hahnemanni D8, Hepar sulfuris D8 30 mg each; Matricaria recutita D3, Symphytum officinale D8 24 mg each; Bellis perennis D2, Echinacea D2, Echinacea purpurea D2 6 mg each; Hypericum perforatum D2 3 mg. **Injection solution:** 2.2 ml containing: Arnica montana D2, Calendula officinalis D2, Chamomilla recutita D3, Symphytum officinale D6, Achillea millefolium D3, Atropa belladonna D2 2.2 mg each; Aconitum napellus D2 1.32 mg; Bellis perennis D2 1.1 mg; Hypericum perforatum D2 0.66 mg; Echinacea D2, Echinacea purpurea D2 0.55 mg each; Hamamelis virginiana D1 0.22 mg; Mercurius solubilis Hahnemanni D6 1.1 mg, Hepar sulfuris D6 2.2 mg. **Ointment:** 100 g containing: Arnica montana D3 1.5 g; Calendula officinalis Ø, Hamamelis virginiana Ø 0.45 g each; Echinacea Ø, Echinacea purpurea Ø, Matricaria recutita Ø 0.15 g each; Symphytum officinale D4, Bellis perennis Ø 0.1 g each; Hypericum perforatum D6, Achillea millefolium Ø 0.09 g each; Aconitum napellus D1, Atropa belladonna D1 0.05 g each; Mercurius solubilis Hahnemanni D6 0.04 g; Hepar sulfuris D6 0.025 g. Excipients: Paraffinum liquidum, cetostearyl alcohol (type A), emulsifying, white soft paraffin, purified water, ethanol, preserved with 13.8 vol.-% ethanol. Ø = undiluted i.e. the so called 'mother tincture'. **Gel:** 10 g containing: Arnica montana D3 0.15 g; Calendula officinalis Ø, Hamamelis virginiana Ø 0.045 g each; Echinacea angustifolia Ø, Echinacea purpurea Ø, Chamomilla recutita Ø 0.015 g each; Symphytum officinale D4, Bellis perennis Ø 0.01 g each; Hypericum perforatum D6, Achillea millefolium Ø 0.009 g each; Aconitum napellus D1, Atropa belladonna D1 0.005 g each; Mercurius solubilis Hahnemanni D6 0.004 g; Hepar sulfuris D6 0.0025 g. Excipients: Carbomers, purified water, sodium hydroxide solution, ethanol. Contains 25 vol.-% alcohol. **Indications: Tablets, injection solution:** Blunt injuries, such as sprains, dislocations, contusions, hemarthrosis and effusions into a joint. Fractures; post-operative and post-traumatic edema and swelling of the soft tissues; inflammatory processes and degenerative processes associated with inflammation on the various organs and tissues, including, in particular, the musculoskeletal system (tendovaginitis, styloiditis, epicondylitis, bursitis, scapulohumeral peri-arthritis, etc.); arthrosis of the hip, knee and small joints; acute cerebral contusion. **Ointment:** Injuries of all kinds (sports injuries and accidents) including blunt injuries, such as sprains, dislocations, contusions, hemarthrosis and effusions into a joint. Closed fractures, etc; inflammatory processes and degenerative processes associated with inflammation on the various organs and tissues, including, in particular, on the support and mobility apparatus (tendovaginitis, bursitis, scapulohumeral peri-arthritis), arthrosis of the hip, knee and small joints. **Gel:** Blunt injuries, such as sprains, dislocations, contusions, effusions of blood and effusions into a joint. Closed fractures, inflammatory and degenerative processes associated with inflammation of various organs and tissues, including, in particular, the support and mobility apparatus (tenosynovitis, styloiditis, epicondylitis, bursitis); arthrosis of the hip, knee and small joints. **Contraindications: Tablets, injection solution:** Hypersensitivity to one of the active ingredients or excipients, to Arnica, Chamomilla, Achillea millefolium or to other plants of the daisy (composite) family. As a matter of principle, Echinacea should not be used in progressive, systemic diseases such as tuberculosis, leukemia or leukemia-like diseases, inflammatory diseases of the connective tissue (collagen disease), autoimmune diseases, multiple sclerosis, AIDS, HIV infections or other chronic viral diseases. **Ointment/Gel:** Hypersensitivity to one of the active ingredients or excipients, to Arnica, Chamomilla, Achillea millefolium or to other plants of the daisy (composite) family. **Side effects: Tablets, injection solution:** In rare cases hypersensitivity reactions or allergic skin reactions (redness, swelling and pruritus) can occur in people with known hypersensitivity to composites (e.g. Arnica, Chamomilla, Achillea millefolium), in which case use of the product should be discontinued. Skin rash and itching (pruritus), and in rare cases facial swelling, shortness of breath (dyspnea), dizziness and a fall in blood pressure, have been observed after treatment with products containing Echinacea extracts. Hypersalivation may occur after administration, in which case use of the product should be discontinued, too. Allergic reactions may occasionally occur on account of the homeopathic active substance Mercurius solubilis, too. **Injection solution:** In individual cases, hypersensitivity reactions (up to the anaphylactic reaction) are possible in persons with hypersensitivity to composites (e.g. Arnica, Chamomilla, Achillea millefolium). Temporarily, reddening, tumefaction and pain may occur on the puncture site. **Ointment/Gel:** Hypersensitivity reactions or local allergic reactions (cutaneous inflammation, redness, swelling and pruritus) may occur in rare cases, in which case use of the product should be discontinued. **Interactions with other medication:** None known. **Dosage: Tablets:** In general, 1 tablet to be dissolved in the mouth 3 times daily. **Injection solution:** In acute disorders daily, otherwise 3–1 times weekly 1–2 ampoules i.m., s.c., i.d., i.v., periarticular. **Ointment:** Apply to the affected parts and rub in, morning and evening, or if necessary, more often, possibly also applying an ointment dressing. **Note:** Do not apply the ointment to large areas for a longer time or directly into open wounds. **Gel:** Apply to the affected parts 1–2 times daily, or if necessary, more often. **Package sizes: Tablets:** Packs containing 50 and 250 tablets. **Injection solution:** Packs containing 10 and 100 ampoules of 2.2 ml each. **Ointment:** Tubes containing 50 and 100 g of ointment. **Gel:** Tubes containing 50 and 100 g of gel.

Medication names, indications and formulas may vary from country to country; package inserts provide country-specific information.

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