Summary

In the introduction (chapter 1) a description of acute and chronic pain in the orofacial area is given. The most prevalent type of acute pain in the orofacial area is pain after surgery. Chronic pain can be divided in different categories. Musculoskeletal pain is followed by neuropathic pain as the main cause of chronic orofacial pain. There are different treatment modalities in chronic and acute orofacial pain. In chronic pain some suggest the use of anticonvulsants or antidepressants. Common treatment modalities in the treatment of acute orofacial pain are the use of non-steroidal anti-inflammatory drugs (NSAIDs), paracetamol, corticosteroids or opioids. The simplest and perhaps oldest therapeutic modality might be cryotherapy. Hypothetically, compression of the surgical site after orthognathic or third molar surgery can lead to decreased blood flow by means of vasoconstriction, consequently reducing the flow of inflammatory and pain mediators in the surgical field. Most studies on third molar surgery concern pain management after surgery. There is a variety of pain rating scales that are used to assess patients’ pain outcomes. The visual analogue scale (VAS) is the most commonly used to assess pain intensity. Either single or multiple pain assessments can be used to determine the experienced pain after a surgical procedure. Finally a treatment is classified as successful when patients report a postoperative pain that is significantly less than baseline measurements or control group measurements.

In chapter 2 a systematic review is presented providing information on the use and the effectiveness of anticonvulsants in orofacial pain disorders using eligible trials identified from the Cochrane, PubMed and Ovid MEDLINE database from 1966 through March 2010. The search resulted in sixteen randomized controlled trials (RCT’s) with a variety of diagnosis including, neuropathic pain, such as refractory trigeminal neuralgia, neuropathic cancer pain and postherpetic neuralgia, chronic masticatory myalgia, stomatodynia, traumatic nerve injury pain and glossopharyngeal neuralgia. In eight studies the patient population consisted not only of patients with orofacial pain but also patients with other pain disorders. Because of the heterogeneity of study populations and the difficulty of extrapolating these studies to ‘orofacial complaints’ alone, only eight of the sixteen identified articles are included in this review. Based on this review, it is concluded that there is limited to moderate evidence for the efficacy of anticonvulsants in the orofacial pain disorders. Carbamazepine seems to be promising in the treatment of trigeminal neuralgia.

In order to be able to make a best evidence choice between available antidepressants for the treatment of orofacial pain, a systematic review was conducted on existing randomized controlled trials of antidepressants. This review is presented in chapter 3. Trials were identified from the PubMed database till March 2012, from references in retrieved reports and from references in review articles. Six articles were found and
included in this review. Four studies were randomized placebo-controlled trials and two studies were randomized active-controlled trials. Two independent investigators reviewed these articles using a 15-item checklist. All six trials were of high quality according to the 15-item criteria. Nevertheless there was limited evidence to support the effectiveness of antidepressants on orofacial pain disorders, because of the heterogeneity of treatment modalities and the low amount of randomized controlled trials per diagnose.

In a previously reported randomized trial, ice compression and compression proved to be superior in reducing postoperative pain and discomfort after surgical third molar removal when compared with no treatment. However, compression and ice compression were not significantly different in terms of reducing postsurgical pain. According to the authors the similar effect of compression and ice compression in their study may partly be explained by the vasoconstrictive effect. Hypothetically, compression of the surgical site after third molar removal can lead to decreased blood flow by means of vasoconstriction, consequently reducing the flow of inflammatory and pain mediators in the surgical field. So, introducing a vasoconstrictive modality to the operating site may influence the pain intensity. In chapter 4 a RCT is described addressing the above mentioned hypothesis. All participants in this study received the same local anaesthetics before surgery. Participants in group A (the vasoconstriction group) received, after surgical removal of the lower third molar, one cartridge of Ultracaine D.S. Forte; those in group B (control group) received one cartridge Ultracaine D.S. after surgical removal of the lower third molar. The surgeons performing the surgical procedures were not blinded to the randomization scheme. The patients and the investigators were blinded to their assignment in the randomization. Regardless of the randomization group, all patients received standard pain medication. In a pain diary containing a visual analogue scale (VAS) of 10 cm, the patients recorded the intensity of pain three times a day for one week. In addition, all patients rated the global perceived effect (GPE) on a 7-item scale. The results indicate that extra epinephrine is a good method for reducing pain and discomfort after surgical removal of third molars. However, the study population was to small to draw firm conclusion concerning the hypothesis.

In chapter 5 a prospective, randomized, placebo-controlled, single-blind pilot study is presented, which was designed to investigate the effect of cryotherapy on pain and quality of life after orthognathic surgery. Participants in group A applied 20 hours of cold water circulation with the Hilotherm® mask, with a temperature of 15°C; those in group B received the Hilotherm® mask without circulation (control group); and those in group C did not apply any compression. Pain intensity was measured on a VAS three times a day for seven days. At day seven, overall pain reduction was scored on a global perceived effect (GPE) scale and a quality-of-life questionnaire was completed. Fifty-
four patients completed the trial. The VAS scores did not show any significant differences in pain intensity between the groups. Based on the GPE ratings, in groups A and C more patients indicated that pain was reduced successfully, however, the results were not statistically significant. Quality of life showed no significant differences between the three study groups. Concerning the results of this study, it is difficult to draw firm conclusions on the use of cryotherapy in postoperative pain management after orthognathic surgery.

In clinical studies with patients undergoing surgical removal of the third molar, pain is usually assessed by a multiple pain rating. This rating is mostly used as the primary outcome measure. However, multiple ratings will lower patient compliances. A single pain rating would therefore be more practical. In chapter 6 a study is presented investigating whether a single pain rating (“recalled average” pain) can replace multiple pain ratings (“actual average” pain) in a group of patients undergoing surgical third molar removal. To study the agreement between these tests the Bland – Altman agreement analysis was used. The results show that both measurements correlate good to excellent. However, there was no degree of agreement between both methods. It was concluded that, in contrast to chronic pain patients, a single rating of pain “on average” (“recalled average” pain) is not an accurate predictor of the actual “average pain” in patients with pain after surgical removal of the mandibular third molar. Therefore, a single pain rating cannot replace a multiple pain rating in these patients.

In chapter 7 a study is presented on the clinically important change in pain intensity on the visual analogue scale (VAS) following surgical removal of the third molar. The study population consisted of patients participating in three randomized trials. Patients were asked to rate their pain three times a day over a period of seven days on a 10 cm VAS after surgical removal of the third molar. Global Perceived Effect (GPE) was measured on Day 1 and Day 7 and was used as the external criterion for assessing clinically important pain reduction. GPE scores of 6 (“much improved”) or above were classified as clinically “successful” and scores of 5 (“slightly improved”) or below were treated as clinically “unsuccessful”. For each trial, the mean absolute and relative changes in VAS ratings were calculated for both “successful” and “unsuccessful” treatments. Sensitivity and specificity analyses were performed. The results demonstrate that patients who reported “successful” pain reduction showed a relative pain reduction of ≥60% and an absolute pain reduction >2.5 cm on the VAS, whereas patients who classified their pain reduction as “unsuccessful” had a relative pain reduction of ≤18.5% or less and absolute reduction <0.5 cm on the VAS. Furthermore, sensitivity and specificity analyses showed that a cut-off point of ≥50% relative pain reductions had the best balance of sensitivity and specificity. In conclusion, a relative pain reduction of 50% or more and an absolute pain reduction of at least 2.5 cm on the VAS were most accurate in predicting a successful pain reduction after a given treatment.