

**Title: Introduction and assessment of orthognathic information clinic**

**Running head: Orthognathic information clinic**

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## Summary

**Background/Objectives:** Orthognathic treatment is routine practice to rehabilitate severe malocclusions and dentofacial deformities. Because orthognathic treatment is elective, patient's involvement in deciding whether to proceed with treatment is vital. Interaction and communication between patient and treating team plays a key role in achieving post-treatment satisfaction. To achieve satisfaction an orthognathic "information clinic" for prospective orthognathic patients was established at Oral and Maxillofacial Unit, Tampere University Hospital, Finland. "Information clinic" includes short talks with power-point presentation given by orthodontist, oral hygienist, oral and maxillofacial surgeon, psychologist and previous patient. Aim of the study was to set up an "information clinic", and more specifically, 1) to assess patients' opinions on the "clinic" during pilot phase (2013-2014) and 2) to analyze general statistics during the first three years (2013-2016). **Methods:** During the pilot phase patient opinions, based on voluntary questionnaire, were obtained from 85 people. General data was collected for the clinics run in 2013-2016. **Results:** 72% of respondents reported the information provided to help in their decision making to proceed/not proceed with treatment. Majority considered the information about the surgical aspects and meeting patient who had undergone orthognathic treatment to be the most important part of the clinic. Between March 2013-2016, 290 prospective orthognathic patients were invited to 29 "information clinics." 194 patients attended, of whom 137 were female and 57 male (age range 15-67 years). **Conclusions:** The questionnaire and verbal feedback from the patients was positive, hence the "information clinic" is now offered as a routine process to all prospective orthognathic patients in our clinic.

## Introduction

Over the last 60 years orthognathic treatment has become routine practice worldwide to manage severe malocclusions and dentofacial deformities which are outside the scope of orthodontic treatment alone. Orthognathic treatment usually involves three stages: pre-surgical orthodontics, surgery and postsurgical orthodontics. Osteotomy techniques and osteosynthesis methods have greatly improved in recent years, allowing immediate post-surgical jaw functioning in most cases. Alongside these technical improvements, patients' general involvement in their own medical treatment has changed enormously from the patient being a passive receiver of care to being an active decision maker, alongside the clinical team. Therefore, a good technical outcome as judged by the clinician no longer fulfills the criteria of successful medical care, the opinion of the patient and their family/spouse/close friends must be taken into account. Sometimes the patient's own agenda for undertaking orthognathic treatment also differs from that of the orthodontist and/or surgeon (1, 2). In any case, orthognathic treatment should be evidence-based and patient-centered integrating clinical expertise, patient's needs and preferences, and the most current clinically relevant evidence.

The most common motivating factors are improvements in masticatory function, facial and dental aesthetics and quality of life and treatment remains elective in most cases. Therefore, the patient's involvement in making the decision regarding whether or not to commence treatment is vital. In the decision making process, it is important that the patient and the clinical team discuss and understand the treatment goals and the outcomes which are achievable. Cunningham and Shute (3) suggested that a patient's satisfaction with treatment is affected by four main factors: a technically good result, internal patient related factors, interaction/communication between patient and personnel and external factors to the patient and treating team. Of these, "interaction and communication" at all stages of treatment seems to play a key role in achieving post-treatment satisfaction. A technically good result is not a guarantee of satisfaction if pre-treatment information and communication regarding the treatment process and goals have been incomplete or the patient believes that his/her concerns have not been heard or taken seriously.

Ryan et al. (4) developed and introduced a new style of orthognathic clinic in the UK in order to enhance prospective patients' awareness and involvement in orthognathic treatment, particularly in the consent and decision making process. Based on the findings of the Ryan et al. (4) paper and also the findings of a study by Espeland et al. (5), an orthognathic "information clinic" was established for prospective orthognathic patients at the Oral and Maxillofacial Unit, Tampere University Hospital, Finland. Piloting of the clinic started in March 2013 and continued till end of 2014, and was thereafter implemented as a routine part of the care pathway for all prospective orthognathic patients.

The general aim of this development process was to set up an "information clinic" for prospective orthognathic patients in order to increase their understanding and involvement in orthognathic treatment. More specifically, the aims were 1) to evaluate patients' opinions on and their perceived benefits from the clinic during the piloting phase and 2) to analyze general statistics of the clinic during the first three years.

## Material and methods

Before initiation of the “information clinic” patients who were referred due to a severe skeleto-dental malocclusion, and would possibly be managed with orthognathic treatment, were seen for their first visit by an orthodontist in the Oral and Maxillofacial Unit. Patients were examined, verbal information given and an information leaflet provided giving details of the general aspects of the treatment. The next phase included taking records (impressions for study models, facial and dental photos, imaging) and, at the third appointment the individual treatment plan was discussed and consent obtained. At this time, patients also had an appointment with an oral and maxillofacial surgeon. There were no joint visits with the specialists involved and no psychologist was involved in the team. With the increasing understanding of the importance of the patient’s engagement with the treatment, there was a wish to improve this process.

To organize the orthognathic “information clinic” a general benchmarking process was applied. Initially, a visit was organized to the Orthodontic and Maxillofacial Surgery Departments at the Eastman Dental Hospital, UCLH Foundation Trust (September 2012) to allow the Tampere team to familiarize themselves with the new style of orthognathic clinic reported by Ryan et al. (4). Based on this experience, an “information clinic” was planned to include a series of 15-20 min talks given by an orthodontist, oral hygienist, oral and maxillofacial surgeon, psychologist and a previous patient who had completed orthognathic treatment in the department. To enhance information retention a power-point presentation of each topic was prepared to supplement verbal and written information (6, 7, Table 1). Explanation of the whole treatment process was included (Figure 1).

According to the new process after the first visit to the Unit, each prospective patient was invited to attend the “information clinic” and they were advised that they could attend alone or could bring a spouse, family member or close friend with them. It was emphasized that the information at this point would be general and not yet specific to his/her own malocclusion. Attendance was voluntary and at no cost to the patient. Each clinic lasted about two hours, and a maximum of 10 patients were invited at the same time. No exclusion criteria were applied. The clinic was designed to be informal and participants were encouraged to ask questions throughout.

To assess the “information clinic”, those patients who attended the first 16 clinics during the pilot phase (between March 2013 and the end of 2014) were given a questionnaire (supplementary data) developed by Ryan et al. (4). Permission was granted to use the questionnaire and assessment of the appropriateness of the questions and translation to Finnish were undertaken by MT and TP. Questions asked about the type and quantity of information given by the team, and personal experience of possible benefit(s) to attending the “information clinic.” The original questionnaire (4) was supplemented with three additional questions: What was the best thing about the meeting? What was the worst thing about the meeting? Would the patient like to make any additional comments? Patients were asked to complete the questionnaire right after the “clinic” and to return it immediately. It was emphasized that this was voluntary and would not affect their care if they chose not to do so. No ethical committee approval was needed, since questionnaires did not include personal identifying details. Fisher’s exact test was used to statistically analyze differences between attendees and non-attendees.

## Results

### *The pilot phase*

During the pilot phase, 104 (73%) of the invited 143 individuals attended the “information clinic”, and 85 (82%) of them returned the questionnaire. Fifty-nine of the respondents (69%) were females, and 26 males. Two patients were 19 years or younger, 18 were between 19-25 years, 10 between 26-30 years, 37 between 30-50 years and 18 patients were over 50 years of age. Fifty eight percent of patients (49/85) attended with an accompanying person, which in the case of the younger patients was most commonly their mother, and in older patients, was most commonly their spouse.

Despite variability in the clinics’ atmosphere (reflected in more or less lively discussions), the majority of participants (98%) were happy with the overall structure of the clinic that the different specialists described their role and topic individually. The presence of other patients with the same kind of problem was considered beneficial by 96% of the respondents; only one patient would have preferred to be alone in the clinic. All patients said they would recommend this type of clinic to others considering orthognathic treatment.

Questions explored whether patients received adequate information relating to dental hygiene, the psychological aspects of treatment (importance of commitment to the treatment, outlook change), orthodontic treatment and surgery; this information was perceived to be “just the right amount” by 92%, 76%, 87% and 73% of the patients, respectively. It became evident that some patients would have liked to have received more information about the surgery itself. Answers to the questions related to psychological aspects varied and a small number of patients (6%) felt they had received “a little too much information.” Eighty-eight per cent of patients felt that the information about the benefits of orthognathic treatment was “the right amount,” while 78% considered the information about risks was “the right amount.” Eighty-six per cent of patients said they had asked the question they wanted, and 83% were satisfied that all of their questions were answered.

Seventy-two per cent of the respondents felt that the information helped in their decision making to proceed/not proceed with treatment. In the open comments section, when patients were asked the most important and interesting parts of the clinic, several patients commented on the information they received about the surgery and also being able to meet and discuss things with a patient who had undergone orthognathic treatment in the past.

### *General statistics 2013 - 2016*

During the 3-year period (March 2013 – March 2016), 290 prospective orthognathic patients were invited to a total of 29 “information clinics.” Sixty-eight per cent of those invited were female (mean age 34 years), and 32% were male (mean age 37 years). One hundred and ninety four patients (67%) attended the clinic, 137 (47%) were female and 57 (20%) male, with an age range from 15 years to 67 years. Despite the tendency that non-attendees were, on average, younger than the attendees, no statistically significant difference was found between the age groups (Table 2,  $p=0.559$ ).

Of the 290 patients, 41 (14%) decided not to start the treatment. Of these 41 patients, 23 (56%) had participated in the “information clinic.” Furthermore, in 10 patients, the preliminary treatment plan was changed not to include orthognathic surgery but to undertake conventional orthodontics and/or prosthodontic therapy. In 25 patients (8.6%) initiation of treatment was postponed due to a medical reason (obesity, pregnancy, general medical problems) or life situation (studies, army). For two patients treatment had to be stopped because they did not adapt to orthodontic appliances.

## **Discussion**

Orthognathic treatment is generally an elective process. To achieve patient-centered post-treatment satisfaction, the achievable goals of the treatment and what the treatment entails, must be made clear before the process begins and must be agreed by the patient and the treating team (4). Based on clinical experience and the previous literature, there is an evident need for improved pre-treatment information delivery in order to ensure clear informed consent processes and optimum retention of that information. Patients have a tendency to selectively recall information, and may suppress anxiety arousing issues (8). One study found that only 40% of the possible risks explained to orthognathic patients were remembered at a later stage (9). This was one of the reasons why a decision was made to set up the orthognathic “information clinic” described in this paper.

The team members prepared the contents of the presentations jointly and included information on the duration of treatment, benefits, complications, expectations, and need for adherence (10-14). Based on the increasing body of evidence related to the association of smoking on wound healing and other surgical complications (15-17), encouragement of smoking cessation was later included in the presentations. The duration of the pre-surgical orthodontic phase offers an opportunity to address this important issue.

Since the present questionnaire was already used in the Eastman Dental Hospital in London, the results can be compared. In the UK study (4) the largest cohort was between 19 and 25 years of age, which is significantly lower than the mean age in the current study (35 years). Despite age difference between the two clinics, the answers concerning organization of the “information clinic” were similar: most patients were satisfied, and would recommend this clinic to others considering orthognathic treatment.

Answers to the questions “Did you receive enough information” varied, but most patients felt that the information about oral hygiene, orthodontics, the importance of commitment and the demanding nature of the treatment were “just the right amount”. In accordance with the UK study, an equal proportion thought the information to the question “Did you receive enough information” was “almost enough” or “a little too much”, which reflects variability in self-reports amongst orthognathic patients. Seventy-three per cent of the respondents felt that the information about surgery and the associated risks was “just the right amount”, but there were more “almost enough” replies than concerning oral hygiene, orthodontics and psychological aspects. The surgical procedure and the peri-operative period (recovery, eating, speaking) seem to be one of the main concerns to patients. However, it has to be highlighted that the whole orthognathic journey has to be understood, and that orthodontic treatment has been found to be the most difficult aspect of the treatment process for many patients (18).

Seventy-two per cent of patients who returned the questionnaire reported that the information assisted in their decision making whether to start the treatment. During the 3-year period, 41 (14%) patients chose not to initiate treatment and, of these, 23 had attended the information clinic.

In many open comments, attendees described how the presentation and discussion with the previous patient was beneficial and the best part of the clinic. Prospective patients clearly want to meet somebody who has undergone a similar procedure (19-21) in order to hear about personal experiences of treatment and answer any questions; this personal perspective is something which the clinical team cannot provide because of lack of personal experience. The presence of the psychologist was variably received, which may reflect individual differences towards psychological counseling. A request was also raised to have peer support during treatment, particularly before surgery, and this will be considered as the next step in the development of the care pathway. Peer support also seems to be a common topic in Internet discussion forums (22).

Participation in the “information clinic” was voluntary: 194/290 (67%) of those invited actually attended. For many younger, though also older patients, the Internet serves as a source of information. Internet contains an enormous amount of patient information and several discussion forums about orthognathic treatment (22, 23). However, the quality of information is variable, being often of low quality and conflicting with the messages from the treating team (22). Despite the fact that adolescents are otherwise engaged with Internet social media (24) , only 8% of adolescent patients have been found to use the Internet as a source of information about their treatment, (24), presumably because of concerns regarding reliability. The support and reaction of family and friends towards post-operative appearance has been found to be highly related to the post-operative satisfaction (25, 26). Therefore, attendance of an accompanying person was encouraged, and took place for 58% of the participants. Future studies will investigate whether there is a difference in a patient’s post-treatment satisfaction based on the different types of pre-treatment information.

The aim for the “information clinic” was to increase the patient’s understanding of what treatment entails, what can realistically be expected from treatment, and finally to make patients question whether their own concern/problem is of a magnitude, which means they wish to commit to this demanding treatment. Information based on the questionnaires and verbal feedback during the pilot phase was positive. Therefore, despite the fact that the “information clinic” means an additional visit, it is now offered as a routine, though voluntary, process to all prospective orthognathic patients in our clinic.

### **Conflicts of interest**

The authors state no conflicts of interest in connection with this paper and are alone responsible for its content and writing.

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Figure 1. Course of orthognathic treatment

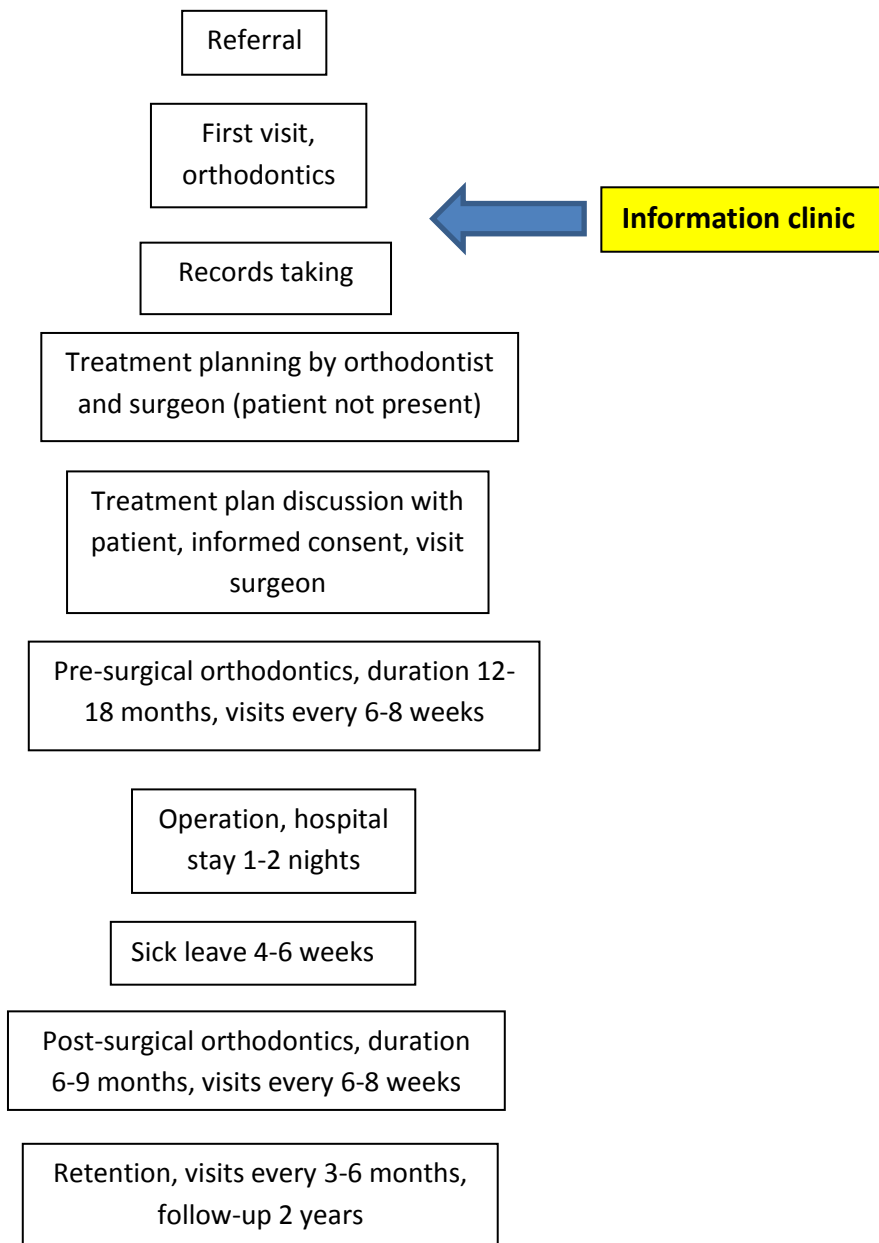


Table 1. Topics included in the talks of the “Information clinic”

Orthodontist

- general aspects of orthognathic treatment (Figure 1)
- why orthodontic treatment is essential
- how orthodontic treatment is done
- why tooth extractions are needed in some cases
- importance of retention
- duration of treatment
- possible side-effects of orthodontic treatment
- importance of refraining from smoking

Oral hygienist

- importance and means to maintain excellent oral hygiene

Oral and maxillofacial surgeon

- possible benefits of orthognathic treatment: improvement of mastication, reduction of signs and symptoms of temporomandibular dysfunction and sleep disordered breathing
- peri-operative and postoperative care
- operation techniques
- restriction in postoperative eating and physical exercise
- contraindications for operation
- possible side-effects: lower lip neurosensory disturbance, relapse
- adverse effect of smoking on wound healing

Psychologist

- understanding of own motivation for treatment
- importance of commitment to long lasting treatment
- preparation to facial outlook change
- need of support from spouse, family members and close friends

Previous patient

- what is the most annoying phases of treatment
- pain during orthodontic treatment
- post operative pain
- eating and speaking difficulties during treatment

Table 2. Number and percentage of those invited, and those who attended/did not attend (in different age groups). No statistical difference in age groups between attendees/non-attendees (Fisher's exact test, p= 0.559)

Age group (years)	Number (percentage) of patients invited	Number (percentage) of patients who attended	Number (percentage) of patients who did not attend
<20	30 (10.3)	19 (6.6)	11 (3.8)
20-29	92 (32)	57 (20)	35 (12)
30-39	64 (22)	44 (15)	20 (7.0)
40-49	51 (17.6)	33 (11.4)	18 (6.2)
50-59	44 (15)	34 (12)	10 (3.0)
>60	9 (15)	7 (2.0)	2 (1.0)
Total	290 (100)	194 (67)	96 (33)