COMMISSIONING GUIDE FOR ORTHOGNATHIC TREATMENT (CORRECTION OF DENTOFACIAL/ JAW DEFORMITY)

CONTENTS

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INTRODUCTION TO COMMISSIONING GUIDANCE

Orthognathic treatment is defined as the treatment of dento-facial deformities. This includes patients with named syndromes and conditions including:

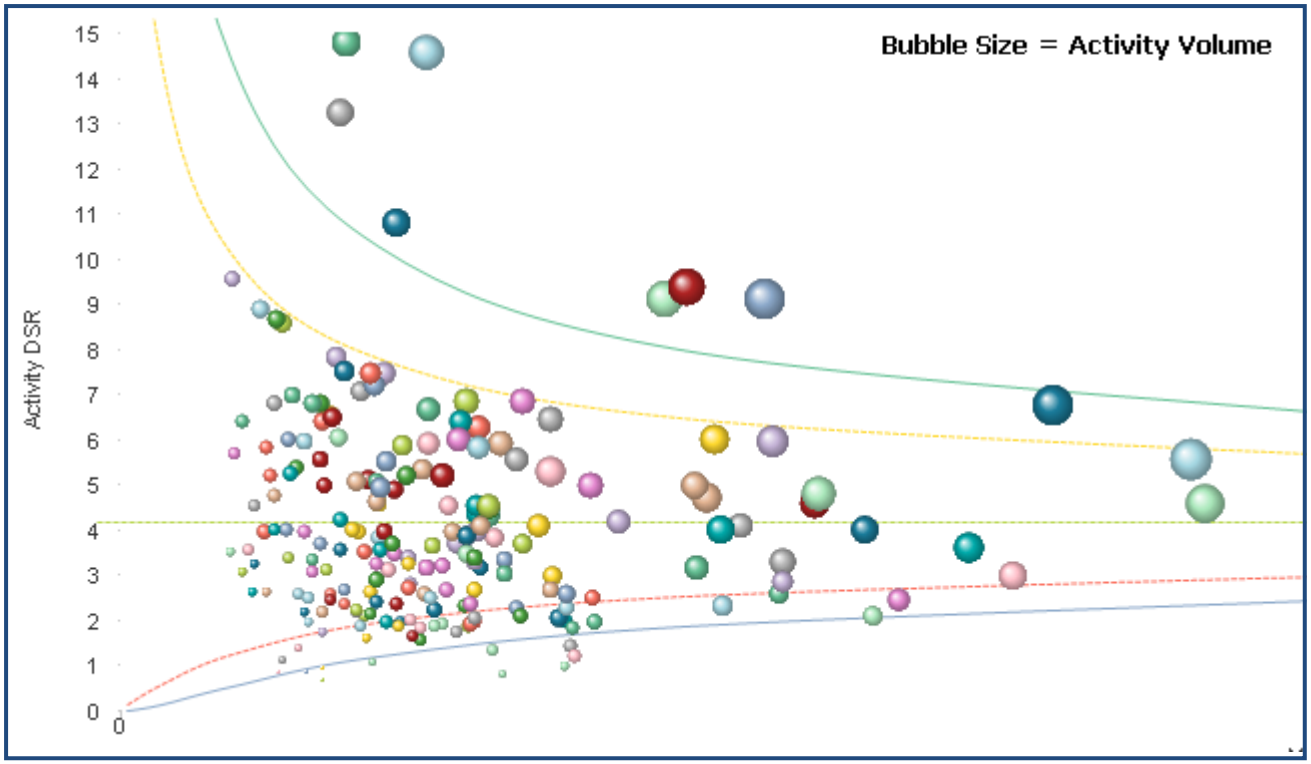
- Patients with significant jaw deformities which result in functional and psycho-social disadvantages
- Cleft lip and palate
- Obstructive sleep apnoea
- Hemi-facial microsomia
- Condylar hyperplasia and
- Post-traumatic jaw deformities and malocclusions

The aforementioned patients commonly have dental malocclusions that cannot be managed by orthodontic treatment alone. All of these conditions are relatively uncommon but can have a devastating effect on patients in terms of function and integration in society.

Although the majority of patients who present for orthognathic treatment are young adults, older patients may also present with worsening symptoms and request treatment. Treatment is usually carried out following cessation of growth.

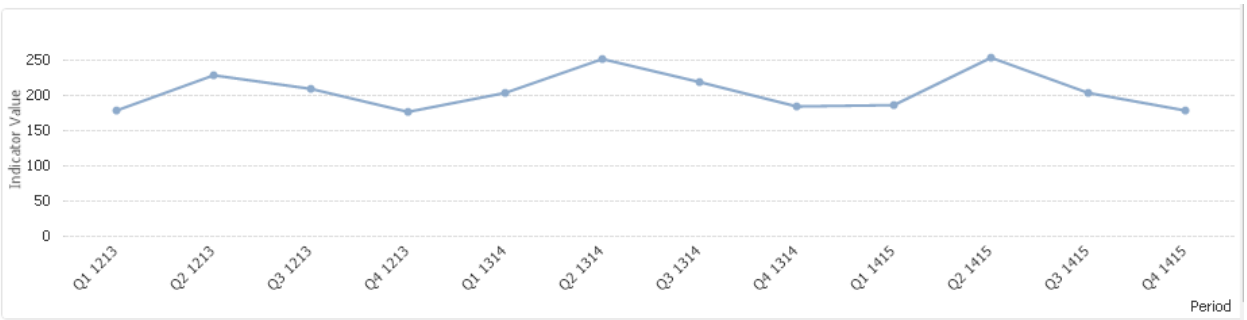
There were approximately 2,230 orthognathic surgical procedures undertaken in England in 2014 (albeit acknowledging the limitations of HES data coding). There is a wide variation in numbers of patients treated across England, however when the numbers of patients treated per year are considered, the numbers appear fairly static (numbers quoted in Version 1 of this document published in 2013 were 2700 for the year in question).

Figure 1:



This graph shows the number of orthognathic surgical procedures per 100,000 population per Clinical Commissioning Group (CCG) across England in 2014. Each bubble represents a CCG, with the size of the bubble representing the number of procedures undertaken.

Figure 2: Figure two shows the national mean values over 3 years.



Without appropriate orthognathic treatment:

- Many conditions cannot be corrected or cannot be optimally managed
- There are potential ongoing treatment needs to deal with the long-term oral sequelae of lack of functional correction
- The patient may suffer ongoing psycho-social disadvantages resulting from their facial/ jaw disharmony

Evidence of effectiveness of orthognathic treatment

Functional problems are often demonstrated in patients who have significant jaw disharmony and frequently motivate patients to seek orthognathic treatment (Forssell *et al.*, 1998; Proothi *et al*., 2010; Alanko *et al*., 2011). These include: trauma to the oral soft tissues, difficulty biting and/or chewing certain foods, speech concerns, temporomandibular joint problems, sleep disorders and the potential for future dental problems (including destruction of hard and soft dental tissues).

The Index of Orthognathic Functional Treatment Need (IOFTN) was therefore developed to stratify and prioritize treatment provision for those severe malocclusions which are causing functional problems and which are not amenable to orthodontic treatment alone. The design and application of the Index follows that of the Index of Orthodontic Treatment Need (IOTN), which is routinely applied for the commissioning of orthodontic treatment. The IOFTN has been shown to demonstrate good validity and reliability (Ireland *et al.,* 2014; James *et al.,* 2015). Several retrospective studies have also confirmed its efficacy in prioritising treatment needs accurately, with 92-95% of current patients being classified in the IOFTN categories 4 and 5, representing the greatest need for treatment (Harrington *et al.* 2015; James *et* al., 2015; Shah *et al*., 2016). It is important to highlight that the index should not be used in isolation and should be used in conjunction with other assessments, particularly a psychosocial assessment.

The beneficial effects of orthognathic treatment on quality of life have also been extensively demonstrated (Cunningham *et al*., 2002; Motegi et al., 2003; Choi *et al.*, 2010; Esperão *et al*., 2010; Murphy *et al.,* 2011; Øland *et al.,* 2011; Silvola *et al*., 2014; Antoun *et al*., 2015; Silva *et al*., 2016) and systematic reviews confirm the positive QoL outcomes (Hunt *et al*., 2001; Alanko *et al*., 2010; Soh and Narayanan, 2013; Liddle *et al*., 2015). Many interventions undertaken in the NHS aim to enhance quality of life (e.g. breast reconstruction following mastectomy, reversal of colostomy etc.) and, equally, orthognathic treatment has important quality of life benefits. Importantly most orthognathic patients are relatively young when they undergo treatment and therefore derive life-long benefit. The relatively low costs of orthognathic treatment (Kumar *et al.,* 2006, 2008) and the cost-effectiveness of treatment have been convincingly demonstrated (Cunningham *et al*., 2003).

It is also of importance that orthognathic surgery is increasingly being recognised as an effective treatment modality for obstructive sleep apnoea, with success rates comparable with continuous positive airway pressure (CPAP) and mandibular advancement splints. A systematic review and meta-analysis confirmed that orthognathic surgery has a pooled success of 86% (Holty and Guilleminault, 2010).

NB: Please see the accompanying literature review for further detail.

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1. HIGH VALUE CARE PATHWAY FOR ORTHOGNATHIC PROCEDURES

Referral

Referral to either a consultant maxillofacial surgeon or consultant orthodontist may come from general medical practitioners, general dental practitioners or other specialists in primary or secondary care. This will result in patients being assessed in a multi-disciplinary specialist orthognathic clinic.

Patients who have sleep apnoea may be referred via a number of different routes, but prior to intervention, must have undergone a formal assessment at a recognised sleep clinic.

Indications for referral

Patients with significant dento-facial deformities causing functional and/or psycho-social problems should be referred for assessment. Similarly patients for whom orthognathic surgery may help manage their sleep apnoea should be referred.

Treatment in secondary care

Patients are usually seen initially by either the consultant maxillofacial surgeon or consultant orthodontist where the basic elements of treatment are discussed. They will then be seen on a multidisciplinary Orthognathic clinic where they are individually assessed and their need for treatment, and expectations from treatment, are assessed in conjunction with consideration of risks and benefits. Patients are considered holistically and significant impacts on daily living are carefully considered. If appropriate, a treatment plan is formulated and discussed with the patient.

Assessment therefore includes:

- Establishing the patient's concerns and expectations
- General medical history
- Clinical, radiographic and photographic examination
- Oral health needs
- Functional needs as based on the Index of Orthognathic Functional Treatment Need (IOFTN), with priority for treatment given to those in IOFTN categories 4 and 5.
- Psychological assessment and assessment of impacts on daily living. Where required, referral for psychological evaluation is arranged.
- Patients receiving treatment for OSA should have the diagnosis confirmed by appropriate sleep studies
- Patients may be put in contact with appropriate support groups.

All treatment plans are bespoke and are based on individual patient needs.

Treatment usually involves three essential stages:

1. *Pre-surgical preparation*

This predominantly involves the orthodontic preparation of patients for surgery by correcting abnormal tooth positions which occur as a result of the underlying jaw deformity. This process generally takes 18-24 months, with regular orthodontic appointments every four to six weeks.

This stage may also involve preparatory surgery, including dental extractions or procedures such as surgically assisted palatal expansion.

2. *Surgery*

This is carried out on an inpatient basis under general anaesthesia. A typical length of stay is around two nights. Post-surgical intensive care is rarely required.

3. *Post-surgery*

Postoperative recovery time is typically two weeks following a single jaw procedure and three weeks following a bimaxillary (upper and lower jaw) procedure.

Intensive regular follow-up is essential in the early post-operative period, ideally in a multidisciplinary setting. A period of post-surgical orthodontics is then required to idealise the final occlusion. The average period of post-operative orthodontics is 6-9 months.

The gold standard for follow-up involves reviews at 1, 2 and 5 years post-surgery (as recommended by the BAOMS and BOS). Standard records are taken at those appointments.

Where should treatment take place?

Treatment is carried out in specialist maxillofacial surgery/orthodontic centres under the supervision of consultant maxillofacial surgeons and consultant orthodontists.

Treatment decisions - Best practice:

Patients who have been assessed on a multidisciplinary Orthognathic clinic as meeting the above criteria are given all appropriate information in a variety of media and given adequate time to assimilate this information and discuss with friends/family prior to reaching a final decision as to whether or not to proceed with treatment. The BAOMS and the BOS both have patient information on their websites and an on-line resource is available through the BOS (http://www.bos.org.uk/Public-Patients/Your-Jaw-Surgery1). Appropriate consent should then be obtained following current accepted guidelines from regulatory bodies.

2. PROCEDURES EXPLORER FOR ORTHOGNATHIC PROCEDURES

The following codes have been included and/or excluded for the purpose of the Procedures Explorer Tool (PET) for Orthognathic Procedures.

Primary OPCS Codes

Intervention	OPCS Code	OPCS Description
Bi-maxillary	V101	INTRACRANIAL OSTEOTOMY OF BONE OF FACE
Bi-maxillary	V102	TRANSORBITAL SUBCRANIAL OSTEOTOMY OF BONE OF FACE
Bi-maxillary	V103	OSTEOTOMY OF MAXILLA INVOLVING NASAL COMPLEX
Bi-maxillary	V104	LOW LEVEL OSTEOTOMY OF MAXILLA
Bi-maxillary	V105	OSTEOTOMY OF ALVEOLAR SEGMENT OF MAXILLA
Bi-maxillary	V108	OTHER SPECIFIED DIVISION OF BONE OF FACE
Bi-maxillary	V109	UNSPECIFIED DIVISION OF BONE OF FACE
Bi-maxillary	V161	OSTEOTOMY OF MANDIBLE AND ADVANCEMENT OF MANDIBLE
Bi-maxillary	V162	OSTEOTOMY OF MANDIBLE AND RETRUSION OF MANDIBLE
Bi-maxillary	V168	OTHER SPECIFIED DIVISION OF MANDIBLE
Bi-maxillary	V169	UNSPECIFIED DIVISION OF MANDIBLE
Single jaw	V101	INTRACRANIAL OSTEOTOMY OF BONE OF FACE
Single jaw	V102	TRANSORBITAL SUBCRANIAL OSTEOTOMY OF BONE OF FACE
Single jaw	V108	OTHER SPECIFIED DIVISION OF BONE OF FACE
Single jaw	V109	UNSPECIFIED DIVISION OF BONE OF FACE

Secondary OPCS Codes

Intervention	OPCS Code	OPCS Description
Bi-maxillary	Z644	MAXILLA
Single jaw	Z64	BONE OF FACE

Excluded OPCS Codes

Intervention	OPCS Code	OPCS Description
Bi-maxillary	-	-
Single jaw	Z644	MAXILLA

3. QUALITY DASHBOARD OR ORTHOGNATHIC PROCEDURES

This is available via the Royal College of Surgeons website.

4. LEVERS FOR IMPLEMENTATION

4.1 Audit and Peer Review Measures

Audit/ Review Measures	Description	Specification
Index of Orthognathic Functional Treatment Need (IOFTN)	An Index developed to ensure those patients who will benefit most are offered treatment. Should be utilised alongside clinical decision making and psycho-social/QoL measures.	Commissioners are able to see appropriate patient selection
Patient satisfaction surveys	Providers can demonstrate collection of data for orthognathic outcome audits.	Commissioners are able to see evidence of participation/completion
Outcome data/audits	Units and individual consultants should be able to provide satisfactory evidence of participation in audits and evidence of high quality outcomes. Units should also participate in nationally directed audits.	Commissioners are able to see evidence of participation/completion

Table 4.2 Quality Specification/CQUIN

Measure	Description	Data Specification (if
Length of stay	Demonstrates lack of deviation from national average	Data available from HES
Readmission rate at 7 and 30 days	Demonstrates lack of deviation from national average	Data available from HES

5. DIRECTORY

5.1 Patient Information for orthognathic procedures

	Published By	Web link (if available)
BAOMS	BAOMS	http://www.baoms.org.uk/What_is_Oral_and_Maxillofacial_Surgery/Sub_specialist_Areas/Orthognathic_Surgery
BOS website	BOS	http://www.bos.org.uk/PILs
BOS On-line resource	BOS	http://www.bos.org.uk/Public-Patients/Your-Jaw-Surgery1
Saving Faces website	Saving faces	http://www.savingfaces.co.uk/

Title	Published By	Web link (if available)
BAOMS website	BAOMS	www.baoms.org.uk
BOS website	BOS	www.bos.org.uk

6. BENEFITS AND RISKS

Consideration	Benefit	Risk
Patient outcome	Improved function and psycho-social well-being	Detriment to long term oral health, function and psycho-social well-being if treatment is not undertaken
Patient safety	Treatment by appropriately trained and experienced clinicians in specialist units	Inappropriate interventions and adverse outcomes if appropriate specialist pathway is not followed
Patient experience	An efficient and patient-centric process ensures optimal outcomes	Sub-optimal patient experience and outcome if the appropriate pathway is not followed or if the patient is not able to access treatment.
Equity of access	To ensure equal access to effective orthognathic treatment by ensuring appropriate referral and full specialist assessment	Lack of awareness of benefits of treatment and existence of the service by referring clinicians could lead to deprivation of access. Potential difficulty of access for some areas of the country.
Resource impact	Clear guidelines in order to reduce inappropriate referral and intervention	Resource required to maintain adequate training, specialist units and manpower

7. FURTHER INFORMATION

7.1 Research Recommendations

- Targeted research on orthognathic treatment

7.2 Other recommendations

- This is an organic document which in the light of contemporary changes will need to be amended

7.3 Evidence Base

NB: Please see the accompanying literature review for further details.

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Harrington C, Gallagher JR, Borzabadi-Farahani A. (2015) *A retrospective analysis of dentofacial deformities and orthognathic surgeries using the Index of Orthognathic Functional Treatment Need (IOFTN).* Int J Pediatr Otorhinolaryngol 79(7): 1063-6

Holty J-EC, Guilleminault C (2010) *Maxillomandibular advancement for the treatment of obstructive sleep apnea: A systematic review and meta-analysis.* Sleep Med Rev 14: 287-297

Hunt OT, Johnston CD, Hepper PG, Burden DJ. (2001) *The psychosocial impact of orthognathic surgery: a systematic review.* Am J Orthod Dentofacial Orthop. 2001 Nov;120(5):490-7

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Kumar S, Williams A, Sandy JR. (2006) *Orthognathic treatment: how much does it cost?* Eur J Orthod 28: 520-528

Kumar S, Williams A, Ireland AJ, Sandy JR. (2008) *Orthognathic cases: what are the surgical costs?* Eur J Orthod 30: 31-39

Liddle MJ, Baker SR, Smith KG, Thompson AR. (2015) *Psychosocial outcomes in orthognathic surgery: a review of the literature*. Cleft Palate Craniofac J 52(4): 458-470

Motegi E, Hatch JP, Rugh JD, Yamaguchi H. (2003) *Health-related quality of life and psychosocial function 5 years after orthognathic surgery.* Am J Orthod Dentofacial Orthop. 124(2): 138-43.

Murphy C, Kearns G, Sleeman D, Cronin M, Allen PF. (2011) *The clinical relevance of orthognathic surgery on quality of life*. Int J Oral Maxillofac Surg. 40(9): 926-30.

Øland J, Jensen J, Elklit A, Melsen B. (2011) *Motives for surgical-orthodontic treatment and effect of treatment on psychosocial well-being and satisfaction: a prospective study of 118 patients.* J Oral Maxillofac Surg 69: 104-113

Proothi M, Drew SJ, Sachs SA. (2010) *Motivating factors for patients undergoing orthognathic surgery evaluation.* J Oral Maxillofac Surg. 68(7): 1555-9.

Shah R, Breeze J, Chand M, Stockton P. (2016) *The Index of Orthognathic Functional Treatment Need accurately prioritises those patients already selected for orthognathic surgery within the NHS.* Br J Oral Maxillofac Surg 54(5): 511-514

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7.4 Guideline Development Group for orthognathic procedures

A commissioning guidance development group as detailed below produced the initial version of this document (Version 1 2013).

Name	Job Title	Affiliation
Mr Paul Johnson	Consultant Maxillofacial Surgeon and Chair	BAOMS
Professor Iain Hutchison	Consultant Maxillofacial Surgeon; Founder, Saving Faces	BAOMS, Saving Faces
Mr Stephen Walsh	Consultant Maxillofacial Surgeon	BAOMS
Mr Dean Kissun	Consultant Maxillofacial Surgeon	BAOMS
Professor Nigel Hunt	Professor/Honorary Consultant in Orthodontics	BOS
Professor Susan Cunningham	Professor/Honorary Consultant in Orthodontics	BOS
Dr Justin Shute	Consultant Liaison Psychiatrist	
Ms Nikkie Garnham	Dental nurse	Lay representative
Mr Graham Pettett	IT consultant	Patient representative
Dr Jackie Sowerbutts	Dental Public Health lead, Surrey County Council	Commissioner representative

The current version of the guide (Version 2 2016) was considered and revised by the group shown below:

Name	Job Title	Affiliation
Mr Ken Sneddon	Consultant Maxillofacial Surgeon and Chair	BAOMS
Mr Mike Davidson	Consultant Maxillofacial Surgeon and Chairman of Council of BAOMS	BAOMS
Professor Nigel Hunt	Professor/Honorary Consultant in Orthodontics	BOS and RCS England
Professor Susan Cunningham	Professor/Honorary Consultant in Orthodontics	BOS
Mr Divyash Patel	Clinical Lead, Office of the Chief Dental Officer	Medical Directorate, NHS England
Graham Pettett	IT consultant	Patient representative