Commissioning guide:

Orthognathic Treatment (Treatment of Dentofacial/Jaw Deformity)

Sponsoring Organisation: BAOMS
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Introduction

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).
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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www.baoms.org.uk

www.bos.org.uk
1. High Value Care Pathway for orthognathic treatment

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.

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.
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ORTHOGNATHIC TREATMENT

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-Surgery). 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.

Users can access further procedure information based on the data available in the quality dashboard to see how individual providers are performing against the indicators. This will enable CCGs to start a conversation with providers who appear to be 'outliers' from the indicators of quality that have been selected.

The Procedures Explorer Tool is available via the Royal College of Surgeons website.

3. Quality dashboard for orthognathic procedures

The quality dashboard provides an overview of activity commissioned by CCGs from the relevant pathways, and indicators of the quality of care provided by surgical units.

The quality dashboard is available via the Royal College of Surgeons website.
4. Levers for implementation

4.1 Audit and peer review measures

<table>
<thead>
<tr>
<th>Audit/Review Measures</th>
<th>Description</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>Index of Orthognathic Functional Treatment Need (IOFTN)</em></td>
<td>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.</td>
<td>Commissioners are able to see appropriate patient selection</td>
</tr>
<tr>
<td><em>Patient satisfaction surveys</em></td>
<td>Providers can demonstrate collection of data for orthognathic outcome audits.</td>
<td>Commissioners are able to see evidence of participation/completion</td>
</tr>
<tr>
<td><em>Outcome data/audits</em></td>
<td>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.</td>
<td>Commissioners are able to see evidence of participation/completion</td>
</tr>
</tbody>
</table>

4.2 Quality Specification/CQUIN

<table>
<thead>
<tr>
<th>Measure</th>
<th>Description</th>
<th>Data specification (if required)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Length of stay</td>
<td>Demonstrates lack of deviation from national average</td>
<td>Data available from HES</td>
</tr>
<tr>
<td>Readmission rate at 7 and 30 days</td>
<td>Demonstrates lack of deviation from national average</td>
<td>Data available from HES</td>
</tr>
</tbody>
</table>
5. Directory

5.1 Patient Information for orthognathic procedures

<table>
<thead>
<tr>
<th>Name</th>
<th>Publisher</th>
<th>Link</th>
</tr>
</thead>
<tbody>
<tr>
<td>BOS website</td>
<td>BOS</td>
<td><a href="http://www.bos.org.uk/PILs">http://www.bos.org.uk/PILs</a></td>
</tr>
<tr>
<td>BOS On-line resource</td>
<td>BOS</td>
<td><a href="http://www.bos.org.uk/Public-Patients/Your-Jaw-Surgery1">http://www.bos.org.uk/Public-Patients/Your-Jaw-Surgery1</a></td>
</tr>
<tr>
<td>Saving Faces website</td>
<td>Saving faces</td>
<td><a href="http://www.savingfaces.co.uk/">http://www.savingfaces.co.uk/</a></td>
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</table>

5.2 Clinician information for orthognathic procedures

<table>
<thead>
<tr>
<th>Name</th>
<th>Publisher</th>
<th>Link</th>
</tr>
</thead>
<tbody>
<tr>
<td>BAOMS website</td>
<td>BAOMS</td>
<td><a href="http://www.baoms.org.uk">www.baoms.org.uk</a></td>
</tr>
<tr>
<td>BOS website</td>
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<td><a href="http://www.bos.org.uk">www.bos.org.uk</a></td>
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6. Benefits and risks of implementing this guide

<table>
<thead>
<tr>
<th>Consideration</th>
<th>Benefit</th>
<th>Risk</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patient outcome</td>
<td>Improved function and psycho-social well-being</td>
<td>Detriment to long term oral health, function and psycho-social well-being if treatment is not undertaken</td>
</tr>
<tr>
<td>Patient safety</td>
<td>Treatment by appropriately trained and experienced clinicians in specialist units</td>
<td>Inappropriate interventions and adverse outcomes if appropriate specialist pathway is not followed</td>
</tr>
</tbody>
</table>
### 7. Further information

#### 7.1 Research recommendations

Targeted research on orthognathic treatment.

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

#### 7.2 Evidence base

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


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ORTHOGNATHIC TREATMENT


7.3 Guide development group

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

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

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

<table>
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<tr>
<th>Name</th>
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<tbody>
<tr>
<td>Mr Ken Sneddon</td>
<td>Consultant Maxillofacial Surgeon and Chair</td>
<td>BAOMS</td>
</tr>
<tr>
<td>Mr Mike Davidson</td>
<td>Consultant Maxillofacial Surgeon and Chairman of Council of BAOMS</td>
<td>BAOMS</td>
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<td>Professor Nigel Hunt</td>
<td>Professor/Honorary Consultant in Orthodontics</td>
<td>BOS and RCS England</td>
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<td>Professor/Honorary Consultant in Orthodontics</td>
<td>BOS</td>
</tr>
<tr>
<td>Mr Divyash Patel</td>
<td>Clinical Lead, Office of the Chief Dental Officer</td>
<td>Medical Directorate, NHS England</td>
</tr>
<tr>
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