RD-UK
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Royal College of Surgeons
FACULTY OF DENTAL SURGERY

Guidance on the standards of care for NHS-funded dental implant treatment

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Restorative Dentistry-UK (RD-UK) formerly the Association of Consultants & Specialists in Restorative Dentistry and Faculty of Dental Surgery, Royal College of Surgeons

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Foreword

Dental implants offer significant long-term health benefits to patients from a functional and social aspect and can be a cost-effective alternative to conventional treatments. In light of the emerging evidence of dental implant treatment on long-term oral health gain and biological benefits, this treatment should be available to patients if a tangible health benefit can be achieved, when compared with conventional treatment options, notwithstanding the role of patient-related factors influencing successful outcomes.

The guidance on the availability of dental implant treatment within the NHS is vague and states that 'dental implants are available on the NHS only if there is a medical need for this type of treatment and decisions about which treatment is appropriate will be based on clinical assessment and clinical judgement'.[1] This ambiguity has led to a significant variation in access to dental implant treatment within the NHS, with resources seemingly not being allocated equitably for all 'high-priority' patient groups.[2,3] This is largely due to the perceived high cost of treatment, which has also led to the view often being taken that dental implant treatment should not be routinely available on the NHS, which goes against the NHS parameters of patient care.[4] As demand for dental implant treatment is high within the publicly funded NHS, guidelines for patient selection and agreed standards of care are essential to help both providers and commissioners of health care.

This document updates the 2012 *Guidelines for Selecting Appropriate Patients to Receive Treatment with Dental Implants: priorities for the NHS*.[5] The word 'standard' has been used to reflect the consensus of the desired outcomes in relation to the provision of NHS-funded dental implant treatment. It is aspirational in introducing quality control by promoting clinical excellence and establishing clear monitoring standards for patients, to help report outcomes achieved when treating these patients under an NHS contract.

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Intended audience

This guideline provides information for consultants, specialists and general dental practitioners, as well as other stakeholders involved in the provision and commissioning of dental implants, so that informed and evidence-based decisions are made.

Statement of conflict of interest

The Faculty of Dental Surgery is funded by its fellows and members, and no contributors or reviewers are paid for their work on a guideline, nor is any payment provided in kind.

Aims and objectives

This document updates the 2012 *Guidelines for Selecting Appropriate Patients to Receive Treatment with Dental Implants: priorities for the NHS*.[5] It also aims to provide a more rational basis for referral and focuses on the provision of dental implant treatment within NHS services. It does not include those having such treatment out with NHS provision of care.

Introduction

'Endo-osseous' dental implants, introduced in the late 1980s, have largely replaced all other types of dental implants and are the most common type of dental implant used today due to their improved predictability and outcomes. These implants are surgically inserted into the jaw bone under strict criteria to achieve 'osseointegration' of the implant screw (which replaces the tooth root) with the jaw bone. The screw retains a prosthesis, which can be a single tooth, multiple teeth or dentures, that is removable by the patient or fixed into the mouth. Originally provided for edentulous patients struggling with conventional dentures, dental implants also provide a safe, predictable and cost-effective alternative to some conventional treatments in partially dentate patients. They also provide patients with enhanced quality of life by improving function and confidence.

There are numerous dental implant systems available on the market, offering a broad product range to cater for a range of clinical scenarios. These systems are considered acceptable by experienced clinicians. However, only a few systems offer long-term proven success rates (10 years or more) with comparable outcomes. Although there is no single leading dental implant system within NHS service provision, these few systems are all deemed appropriate, with successful outcomes achieved by careful patient selection, delivering treatment in line with recommended protocols and ensuring that a short- and long-term monitoring and maintenance plan has been established for the patient with their general dental practitioner. The choice of the systems used depends on decisions made by clinical teams in the provider organisation and their compliance with NHS tendering and procurement rules, influenced by the experience within the dental team, cost effectiveness and the need to retain equipment and components.

The current provision of NHS-funded dental implant treatment is largely in hospital settings (dental teaching hospitals and district general hospitals). These will each have a contractual agreement with the commissioners on the level of dental implant activity that is provided, based on locally established protocols, in line with the acceptance criteria outlined in the previously published guidelines from the Royal College of Surgeons of England.[5] As a result, there is a significant variation across the country on how dental implant treatment is commissioned and funded, most probably due to the variable interpretation of the published guidelines and local policy.

Any provider considering provision of NHS-funded dental implant treatment should meet the criteria listed below:

- have appropriately trained and skilled clinicians who ideally form a multidisciplinary team to assess the clinical suitability for dental implants where the conventional treatments have been tried and failed or are not appropriate, and there is a consensus that dental implants would be of significant health benefit to the patient;
- compliance with the national NHS implant guidelines and standards;
- ability to demonstrate that other forms of conventional treatment have been tried and failed and implants are the only option to meet the clinical needs of the patient;
- use agreed local processes for funding approval which can be audited for against the specified criteria for priority groups;
- audits using standardised assurance forms collecting the required data in a standardised way to demonstrate compliance;
- use outcome measures to demonstrate the effectiveness of the treatment;
- use patient-reported outcome and experience measures to demonstrate patient satisfaction.

Dental implants and quality of life

Tooth loss has been reported to have a significant negative effect on a person's quality of life, having an impact on self-esteem, confidence and function.[6,7] The positive impact of dental implant treatment on the quality of life of edentulous patients has been reported,[8,9] and more recently implant-related improvements in the oral health-related quality of life with at least one implant in the front of the mouth have also been reported.[10] Others have reported that dental implant therapy has a positive effect on oral health-related quality of life as determined by the oral health impact profiles.[11,12] Dental implant treatment provided in a systematic and structured manner does therefore offer significant health gains and benefits to patients by improving their function and self-esteem but also by offering them a tooth replacement option that is independent of adjacent teeth, resembling their own teeth. However, although the real patient benefit over extended periods still needs to be evaluated, it is clear that the short-term studies confirm a positive outcome for patients who have had successful dental implant treatment. Success is dependent upon careful case selection, assessment and planning, with the treatment being led by an experienced and appropriately trained clinical team.

Cost effectiveness of dental implant treatment

Cost effectiveness in monetary terms is measurable; however, cost effectiveness and benefit for health gain has no established value. The relatively high costs of dental implant treatment in the initial stages are outweighed by both the short- and long-term health benefits experienced by patients. A Swiss study assessing the cost effectiveness of dental implant treatment carried out within their national health insurance system, concluded that dental implant reconstruction demonstrated a more favourable cost-effectiveness ratio and recommended implant treatment from an economical point of view, especially where healthy adjacent teeth would have been damaged during conventional treatments.[13] The same group evaluated the cumulative costs for oral rehabilitation of patients with birth defects, specifically hypodontia, and concluded that insurance-based healthcare systems should provide implants for this cohort as they remove the need to damage adjacent teeth.[14] These studies clearly demonstrate the cost effectiveness of implant treatment when this is considered largely from a biological perspective, where carefully provided implant treatment is less harmful to the natural dentition. Cost effectiveness of dental implant treatment is also governed by the expertise and experience of clinicians delivering this care, with a need for those undertaking this treatment to have achieved the appropriate and correct standards of training and skill for predictable outcomes, especially in the management of patients with complex and integrated treatment needs. It is important, therefore, that cost-benefit analysis is based on the biological and functional impact of treatment and not only the monetary value.

Success rates of dental implants

The success rates of modern dental implants have been widely published, with highly successful and predictable outcomes as documented by various 10-year studies for all types of treatment modalities including implant-retained fixed bridges, individual crowns and overdentures, as well as obturators and related maxillofacial prostheses.[15,16,17,18] Although cumulative success and survival rates of 92–98% for both dental implants and attached prostheses have been reported, they do not give any indication of outcomes at the individual implant screw and prosthetic level. A dental implant, once integrated and stable for one year after function, should last at least 10 years and the prosthetic refurbishment of the implant-retained prostheses will need to be considered on average at 10–15 years, although the frequency of this review will also be dependent on patient-related factors. These factors, together with the post-treatment maintenance programme, will also influence the successful outcome of implant treatment. Patients with a history of periodontal disease have been reported to have comparable outcomes once the periodontal disease has been treated, stabilised and maintained.[19] Patient selection and assessment thus remain central to the long-term performance and success of dental implant treatment over time. Factors that also influence dental implant success rates include:

- poor dental health and hygiene;
- unstable periodontal disease;
- current smoking or a previous history of smoking/tobacco usage;
- bruxism (affects both implant screws and prosthesis);
- unstable occlusion;
- uncontrolled diabetes.

Patient (priority) groups considered eligible for NHS-funded dental implant treatment

The groups listed below as agreed by clinicians, the working group representing the societies including RD-UK and FDS consider these groups as a high priority for receiving NHS-funded dental implant treatment. This list is not exhaustive and there may be other patients who qualify for dental implant treatment for whom specific case-based requests justifying the need for dental implant treatment can be considered. All patients, including the priority groups, need to meet the general eligibility criteria for implant treatment and must have undergone a clinical needs assessment balanced against the alternative treatment options before being accepted into the NHS system for dental implant treatment.

1 Patients with congenital, inherited conditions that have led to missing teeth, tooth loss or malformed teeth

Patients in this group are often managed by a multidisciplinary team involving clinicians from orthodontics, paediatric dentistry, oral surgery and restorative dentistry. The restorative dentistry lead will plan the tooth replacement for optimising the outcome as they will be involved with the patient's management at each stage of treatment.

1.1 Hypodontia

Patients with hypodontia may have developmental absence of all adult teeth (anodontia) or have one or more adult teeth missing. Teeth that are present often have a poor shape, which complicates the provision of conventional treatment. They will often need orthodontic treatment to align the teeth in their ideal positions during their teenage years, to facilitate tooth replacement with dental implants, which will usually start when they are at least 18 years of age. A request for implant funding ideally should be considered earlier, at the initial planning stage, to facilitate the orthodontic treatment planning process and to also ensure a seamless pathway of patient care.

1.2 Cleft lip and palate

These patients are either young people in whom there has been a failure for teeth to develop in the area of the cleft and who need tooth replacement as part of the reconstruction following surgical repair, or older patients with failing dentitions in whom conventional tooth replacement is not feasible owing to the complexity and compromise of the remaining teeth and oral anatomy.

1.3 Others, such as dentinogenesis imperfecta, amelogenesis imperfecta, dens invaginatus types II and II

These patients usually have malformed and/or ectopic teeth and supporting structures, which complicates the provision of conventional treatment tooth loss.

1.4 Aggressive periodontitis (now categorised as periodontitis)

Patients with aggressive periodontitis who have inherited the condition, which affects the supporting structures of teeth. Early tooth loss is seen because of the severity of the periodontal attachment breakdown, often in young patients, impacting their quality of life. The periodontal condition should have been stabilised and should remain stable for at least six months prior to considering tooth replacement with dental implants.

2 Patients with traumatic events leading to tooth loss

Patients with traumatic tooth loss of any age who have been affected by a traumatic injury resulting in immediate tooth loss with associated loss of the supporting bone and gum tissues. The affected teeth may be retained to preserve the bone and gum tissues until growth ends but, subsequently, are lost and require replacement. The injury may be confined to single or multiple teeth. The tooth replacement options considered should include conventional options before dental implants.

3 Patients with surgical interventions resulting in tooth and tissue loss, for example, head and neck cancer and non-malignant pathology

Patients with surgical interventions resulting in tooth loss require surgery to manage their condition and subsequently require oral rehabilitation to improve function and speech, where conventional options are challenging and compromise both the remaining tissues and patient's quality of life.

4 Patients with congenital or acquired conditions with extra-oral defects of, for example, eyes or ears

Patients with congenital or acquired conditions with extra-oral defects are part of a specialised cohort who are managed by a wider surgical team including maxillofacial, ear nose and throat, craniofacial and plastic surgeons, and clinical dental technicians, together with restorative dentistry clinicians. The latter are usually involved when adjunctive intraoral defects are present and dental implants and craniofacial implants are used to anchor the intra and/or extra-oral prosthesis.

5 Patients who are edentulous in either one jaw or both in whom repeated conventional denture treatment options have been unsuccessful

Patients who are edentulous usually have severe jaw atrophy with anatomical challenge making the wearing of conventional dentures difficult. In these situations, dental implants should only be considered when all other means of constructing a conventional denture have failed. A specialist in restorative dentistry or prosthodontics must assess the quality of the existing dentures and must confirm that all conventional options for denture construction have been exhausted and deemed unsuccessful. The conventional dentures must be of technically ideal quality before a decision of an overdenture supported by two dental implants is considered. The mere fact that a patient would prefer to have their existing dentures replaced by an implant-retained prosthesis or dislikes the thought of wearing dentures would not justify implant provision funded by the NHS.

6 Patients with severe oral mucosal disorders and those with severe xerostomia where conventional prosthetic treatment is not possible and/or the provision of conventional treatment would be detrimental to the mucosal disorders

Patients with severe oral mucosal disorders and those with severe xerostomia have compromised denture-bearing tissues due to the mucosal condition. Denture wearing can often aggravate the condition, traumatise the tissues and compromise the patient's quality of life by reduced function. Patients with dry mouths struggle with wearing dentures because of reduced salivary flow. In both situations, patients should be assessed ideally jointly with a consultant in oral medicine or oral surgery, to optimise their mucosal condition, before the provision of implant treatment is considered.

7 Patients who do not have suitable existing teeth that can be used for anchorage to facilitate orthodontic treatment

Patients who do not have suitable existing teeth that have been identified for orthodontic anchorage for treatment or have natural teeth that are not suitable and cannot be used for anchorage and to do so would be detrimental to the long-term prognosis of the teeth. In these cases, dental implants can be used to provide the required orthodontic anchorage.

General eligibility criteria for NHS-funded treatment

Patients being considered for NHS-funded dental implant treatment must fulfil general criteria to ensure predictability of treatment outcome. While there are no absolute contraindications for dental implant treatment, patients being considered for this treatment on the NHS must:

- be enrolled with and be a regular attender with a general dental practitioner to ensure continuing dental care and long-term monitoring of the dental implants;
- have no evidence of untreated primary dental disease (eg tooth caries, periodontal disease, failing restorations);
- be compliant with daily dental and oral hygiene standards necessary to maintain oral health;
- be non-smokers (see below).

Occasionally, patients being considered for NHS-funded dental implant treatment may not be able to comply with one or more of the above conditions and a clinical assessment may determine that the dental implant treatment is deemed to be the only appropriate level of care to maintain their wellbeing (eg head and neck cancer patients).

Generic criteria for consideration during patient selection

1 Age

Dental implant treatment should not normally be provided for patients until dentofacial growth has ceased. Implant placement, especially in partially edentulous jaws, should be postponed until the end of the craniofacial/skeletal growth.[20] If dental implants are placed during active growth, they may become progressively displaced or malpositioned due to adjacent teeth moving with continued jaw and facial growth. This can, in more severe presentations, result in the need for the implant to be removed.[21,22,23] Patients should therefore usually be at least 18 years of age. Clinicians should be aware that facial growth will continue after the age of 18 and must consider this during treatment planning. Rarely, dental implant treatment to retain prosthesis is necessary at an earlier age to maintain health and function (eg children with disorders with multiple missing or no natural teeth or underdeveloped oral anatomy). The clinician must be aware of the long-term implications and must ensure that the patient and their parents/carers are aware of the risks.

There is no upper age limit for implant placement, provided that the patient can tolerate the treatment and there are no other complicating or contraindicating factors. When older patients are treated with dental implants, their ability to maintain their dental implants in the future should be taken into consideration, especially when conditions such as Alzheimer's, dementia, Parkinson's disease or rheumatoid arthritis are present, as these are highly likely to result in a reduction in either mental or physical ability to undertake daily oral hygiene measures.

2 Medical health

There are no medical conditions that absolutely contraindicate dental implant treatment. The patient should, however, be fit and healthy to undergo surgical and restorative dentistry treatment over a protracted period of time. Patients with the following conditions should not be considered for dental implant treatment until the condition has been managed and stabilised for at least six months:

- poorly controlled diabetes;
- bisphosphonate treatment;
- psychiatric and mental health issues;
- other conditions such as blood disorders, immunodeficiency, alcohol/drug abuse, bone disorders and epilepsy;
- tobacco use;
- poor dental health.

3 Poorly-controlled diabetes

Dental implants in patients with poorly controlled diabetes (HBA1c greater than 8) have a higher complication rate and increased risk of failure.[24,25] Implant treatment should be avoided in these patients until such time as the diabetes can be controlled.

4 Bisphosphonate treatment

Patients on intravenous bisphosphonates should not normally be considered for implant treatment because of the higher known risk of bone necrosis. Patients on short-term oral bisphosphonates have a lower risk of bone necrosis. However, such patients should all be made aware of this risk if they are being considered for dental implant treatment. They would usually only be considered for NHS-funded dental implant treatment if there were no suitable conventional alternatives.[26]

5 Psychiatric and mental health issues

Patients with psychiatric and mental health issues should be considered carefully for dental implant treatment. A clinical dental assessment of the most appropriate choice of intervention should be considered. This clinical assessment should be accompanied by a mental health/psychiatric evaluation to assess the patient's ability to understand and comply with a protracted and complex dental treatment plan, the day-to-day dental hygiene and regular dental attendances, their long-term medical health needs, including indefinite smoking avoidance.

6 Other conditions

Conditions such as blood disorders, immunodeficiency, alcohol and drug abuse, bone disorders and epilepsy will need a detailed assessment to ensure that the condition will not affect the provision of the dental implant treatment.

7 Tobacco use

Smokers and tobacco users have been shown to have a higher risk of complications, with higher failure rates due to the negative influence of nicotine on wound healing.[27] Thus, patients who are tobacco users or smokers (including e-cigarettes) should not be considered for implant treatment. Ex-smokers who have given up for at least three months could be considered for the treatment; however, if they resume smoking during the course of treatment, depending on the stage of the treatment, the treatment should be suspended until smoking ceases. Recent ex-smokers being considered for NHS-funded dental implant treatment should undergo smoking cessation advice before the start of treatment.

8 Poor dental health

Patients should have healthy and well-maintained mouths with no primary disease. They must be regular dental attenders with a general dental practitioner to ensure that there is no primary dental disease present and that they have access to long-term monitoring, follow-up and maintenance care. An unstable and poorly-cared-for mouth is a contraindication to implant treatment. The following dental conditions will need specific attention when considering patients for dental implant treatment.

8.1 Periodontal disease
Patients with a history of chronic periodontal disease should have the disease treated and stabilised for at least six months prior to the start of the implant treatment. These patients have a lower success rate with dental implant treatment and a higher risk of peri-implant disease;[28] however, the outcomes are comparable to those with no history of periodontal disease if the disease remains controlled and stable. These patients usually require more stringent maintenance and follow-up regimens.

8.2 Caries, failing restorations and apical disease
Patients who have teeth with untreated caries and failing restorations should have been stabilised and treated and any apical disease managed prior to the start of the implant treatment.[29]

8.3 Parafunction/grinding habits (bruxism)
Patients with grinding habits will have a higher risk of mechanical complications (eg fracture of the restoration or screws or problems with occlusal overload) and thus should be considered with caution for implant treatment.[30]

8.4 Compliance
Patients considered for dental implant treatment should have good compliance. Dental implant treatment may involve a range of procedures which can be time consuming and need optimal patient involvement during the planning and execution of treatment and also after treatment. Patients who have poor compliance and those with lack of motivation should not be considered for dental implant treatment.

Patients having undergone dental implant treatment on a self-funded basis can have an NHS consultation but do not have access to future NHS-funded care of these dental implants unless there is an need for intervention to manage an acute problem, which often involves removal of the implants. The patient must, however, be reminded that the tooth replacement costs and any other future prosthetic reconstructions will not be funded by the NHS.

Specific eligibility criteria for NHS-funded treatment

Dental implant treatment requires careful planning to ensure successful outcomes. It is important that a detailed assessment is undertaken to ensure that the implant placement and prosthetic reconstruction meets the functional and aesthetic needs of the patient and the long-term biological stability of the tissues. The following parameters should be fulfilled:

- tooth position evaluated and established to determine the correct site of the implant placement to provide a functional and aesthetically acceptable restoration;
- adequate bone quantity and quality (with or without bone grafting) are present to facilitate implant placement that is restoratively and prosthetically appropriate;
- prosthetic design should facilitate the patient's oral hygiene practices to maintain the implants;
- agreed treatment should be planned within a multidisciplinary team where appropriate and risks identified at the outset;
- potential damage to the adjacent anatomical structures identified and risk strategy planned to minimise the risk.

The complexity of the required treatment will be defined by the number of missing teeth, the soft and hard tissue loss and the planned restorative reconstruction, and the patient cohort being treated. Additional diagnostic aides such as computed tomography and three-dimensional diagnostic imaging should be considered in conjunction with routine clinical assessment to achieve the best outcome for the patient. The clinical team in charge of the patient will determine the case complexity including the number of implants and the type of prosthesis.

Maintenance

Dental implant treatment outcomes are dependent on regular monitoring and maintenance. Current NHS-funded dental implant treatment covers the active course of treatment related to the episode of care but does not cover the costs associated with the post-treatment maintenance of the implants or future treatment if required. Patients accepted for NHS-funded dental implant treatment should thus be made aware that the costs associated with the maintenance care of their implant treatment will not normally be funded by the NHS and that they may incur costs for this. Additionally, they should also be made aware that there is no guarantee that any future treatment or replacement costs associated with the implant treatment will be supported by the NHS. Any future treatment needs will need to be supported by requesting funding approval from the NHS.

Discharge

Upon completion of their dental implant treatment, patients will be discharged back to the general dental practitioner, as with all other dental treatment provided in hospital/specialist settings.

The general dental practitioner will have the responsibility of undertaking routine monitoring for the dental implant based reconstruction,[31] which, as for natural teeth and other restorations, will include oral hygiene assessment, bleeding indices and a probing chart, together with radiographs and monitoring of the prosthesis, with possible re-referral to the provider or other implant provider if any problem is noted.

The provider has the following responsibilities:

- obtaining intraoral radiographs of each dental implant taken following the fit of the prosthesis to enable the monitoring of the bone levels at future appointments;
- obtaining a periodontal charting following the fit of the prosthesis to enable monitoring and assessment of the periodontal tissues at future appointments;
- providing the patient with dental hygiene advice specific to their dental implant restoration;
- ensuring that the patient understands that they may need to fund their maintenance care;
- ensuring that the patient understands that their dentist will monitor their implants and prosthesis for them within the NHS provision of care;
- ensuring that the patient understands that their dentist can re-refer them if problems arise in the future but that further treatment may not receive NHS funding;
- providing the general dental practitioner with details of the treatment undertaken including the implant system used, the type of abutments and prosthesis provided, together with the monitoring and expected maintenance regimen required;
- providing replacement or corrective treatment when necessary if problems occur within the first year after completion of treatment.

Following completion of implant treatment, the provider should also ensure that the following information has been documented and provided to the general dental practitioner and the patient:

- personalised instructions appropriate to the type of restoration given to the patient to facilitate their day-to-day dental and oral hygiene around the implants;
- grafting, if undertaken for the site, together with the materials used;
- the implant system used, together with the type, position and diameter of each implant and prosthetic connection;
- whether the prosthesis is integral with or separate from the abutment(s);
- for cemented restorations, the presence of material in the screw access hole, the type of cement used and the site of the access hole within each abutment, to facilitate future access;
- periodontal chart and radiographs taken following the fit of the prosthesis, to enable monitoring.

Further work

Dental implant treatment is an evolving field and it is important that standards and guidelines are updated on a regular basis to comply with this requirement.

While a number of dental implants are being provided through NHS providers, a higher volume is provided through private contractors. This document largely covers standards for providers of NHS-funded dental implant treatment. It is recognised that, currently, while there is ample evidence demonstrating the beneficial effects on health gain and quality of care, there are poor data, complicated by the different ways in which implant treatment can be delivered, available to substantiate cost effectiveness and clinical outcomes associated with this treatment.

The current system for NHS funding of dental implants varies across the country and ranges from individual funding requests for each patient to annual block contracts where a specified level of activity is agreed by the commissioner and supported by submission of audit data demonstrating compliance. Ideally, funding for implant treatment for all providers should be based an annual block contract with compliance submissions, thus ensuring equitable access to implant provision for patients who meet the criteria outlined. It is anticipated that following the pilot work undertaken by NHS England on funding and provision of implant treatment, the revised system for funding will address this variation.

It is anticipated that, in conjunction with national organisations within the NHS, robust arrangements will be put in place to facilitate both clinical outcome and patient experience outcome measures audits to obtain a more objective outcome evaluation of NHS-funded dental implant treatment.

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