Jonathan Sandler Alison Murray

Clinical Photography in an Orthodontic Practice Environment – Part 1

Abstract: Clinical photography has become an invaluable patient record over the past 20 years. With the advent of digital photography it is cheap and easy to produce very high quality records of each and every clinical situation. This is an irreplaceable technique in the teaching and learning environment and is the perfect tool in a busy orthodontic practice. Using modern software, stored photographs are easily accessible and instantly transferable between clinicians anywhere on the globe. Quality photographs will help inform debate about clinical issues.

Clinical Relevance: This first part of this article will discuss the merits of taking clinical photographs and the benefits of high quality pictures to the clinicians as well as the patients. The second part of the article will describe contemporary photographic equipment and the many essential accessory products, as well as how to best to store the images. In addition, 'Top Tips' will be proposed to allow the best possible results to be reliably achieved.

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Why we need clinical photographs

Baseline clinical records

A full set of clinical photographs, if taken to a high standard, is an invaluable record detailing the original clinical situation before any treatment has started. These should be a mandatory record for each and every patient we diagnose and treatment plan, even if the treatment is only extraction of teeth to intercept or simplify the developing malocclusion. Photographs allow us to record not only the relationship of the teeth to their adjacent numbers and their opponents, but also the health of the hard and soft tissues.

When photographs are taken using a standardized method, comparisons can be drawn throughout treatment detailing the specific changes that have occurred during the intervening period. The changes seen are the direct results of our ministrations, combined with the normal growth and development occurring during that time period.

It is essential to document the original clinical situation fully so that, at any stage, meaningful discussions can be entered into, with both the patients and their parents, as to the specific amount of progress that has occurred during treatment. Memories can be inaccurate and both patients and parents soon forget the original arrangement of the teeth. It is only by reference to the original photographs, that they can appreciate the changes that have occurred during treatment.

If removal of any deciduous or permanent teeth is being recommended, it is only by having photographs of the original situation, as well as the models and radiographs, that the full benefis of interceptive extractions can be appreciated (Figure 1a-e).

This record will also prove to be helpful should a dispute arise at a later date, an occurrence that sadly appears to be happening with increasing frequency.

To aid communication with the general dental practitioner

In some clinical situations there can be confusion as to specifically which teeth are recommended for extraction. This may occur where there are supernumerary teeth, such as five lower incisors, or where supplemental lateral incisors have formed. Clinical photographs and radiographs can be printed out within seconds, to be given to the patient or sent to the GDP. Clear markings on the photograph can avoid mistakes in a 'busy' dental practice (Figure 2a, b)

If early dental decay in posterior teeth is suspected, which is highlighted on the OPT, it is always extremely helpful to the practitioner to indicate exactly where the suspected problem lies. Again, within seconds, a picture can be printed in the clinic to allow the patient to share with the GDP the areas causing concern (Figure 3). This printout of the clinical photos, in addition to prints of a digital radiograph

Jonathan Sandler, BDS(Hons), MSc, FDS RCPS, MOrth RCS, Consultant Orthodontist, Chesterfield Royal Hospital, Chesterfield and **Alison Murray**, BDS, MSc, FDS RCS, FDS RCPS, MOrth RCS Consultant Orthodontist, Royal Derby Hospital, Derby, UK.

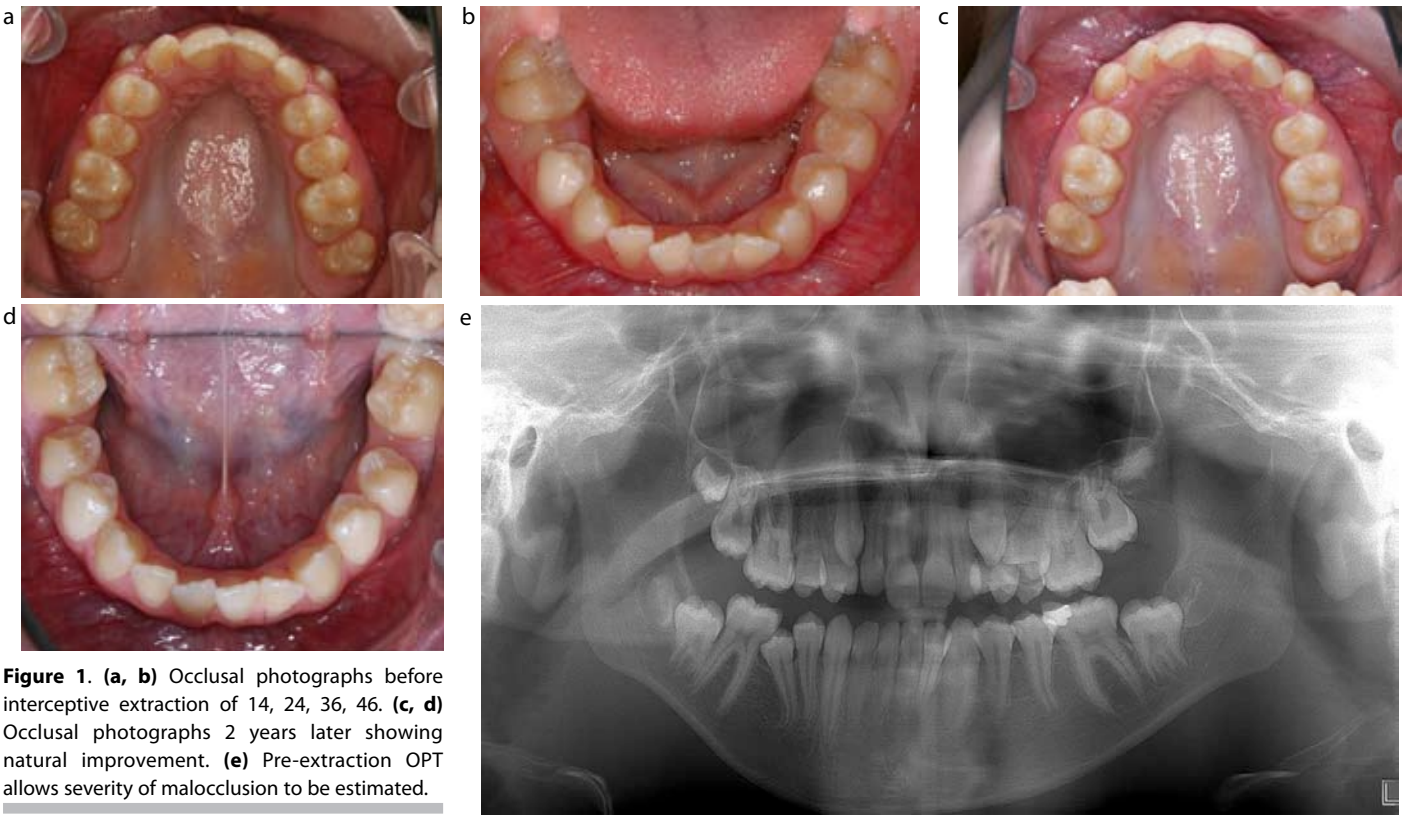


Figure 1. **(a, b)** Occlusal photographs before interceptive extraction of 14, 24, 36, 46. **(c, d)** Occlusal photographs 2 years later showing natural improvement. **(e)** Pre-extraction OPT allows severity of malocclusion to be estimated.

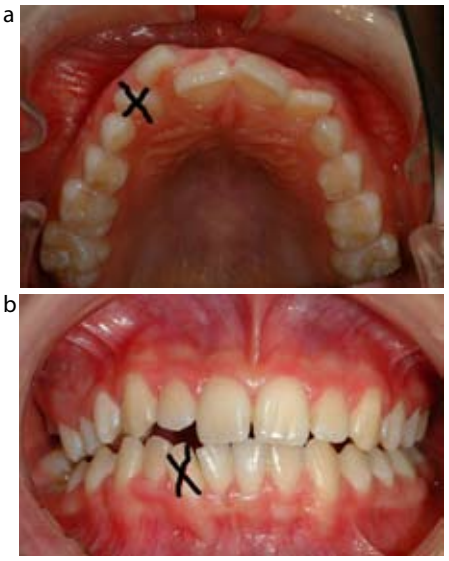


Figure 2. (a, b) Tooth to be extracted marked on photograph so no possibility of errors.

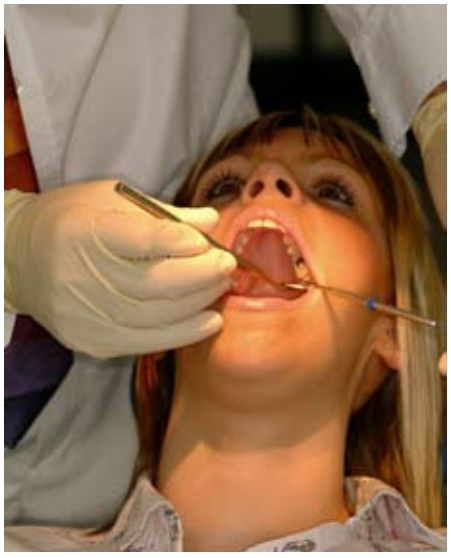


Figure 3. Unsupported probe sticking in upper left molar indicating need for intervention.

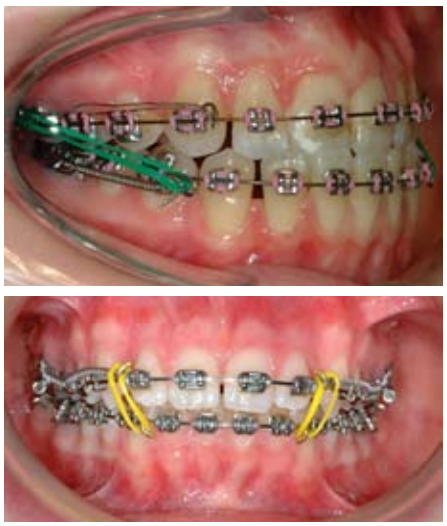


Figure 4. (a) Patients can clearly see where to apply the intra-oral elastics. **(b)** In the absence of photos misunderstandings can occur.

of the suspect lesions, can help the GDP enormously in planning their treatment.

To aid communication with the patient and parents

When asking a patient to use a combination of intra-oral elastics during treatment, it is helpful to print out a photo of the arrangement of elastics and give it to the patient. Using this photograph, the patient should be able to copy the arrangement prescribed exactly (Figures 4a, b).

Photographs as a teaching tool

The clinical photograph has no equal as a tool for teaching orthodontic techniques. Ideally, in a teaching situation, clinical photographs should be taken on a visit-by-visit basis and these photographs should be displayed on a moniter at the chairside and referred to at every patient visit. It is only when both the teacher and the student can see how the teeth were

Figure 5. Chairside photographs on every patient are the 'Gold standard'.

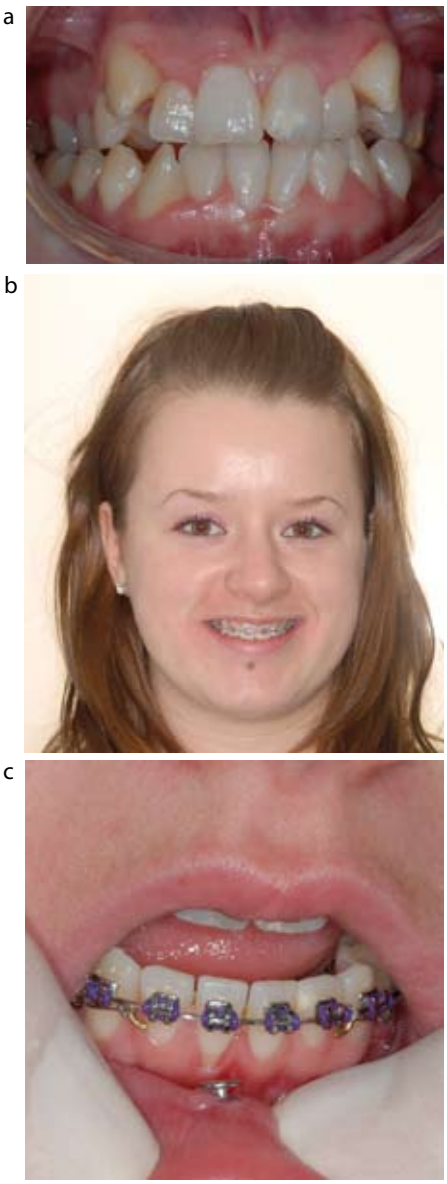


Figure 6. (a) Pre-treatment photograph shows healthy gingival margins with no recession. **(b)** Patient has had a lip piercing. **(c)** Recession directly related to the position of the lip stud.

specifically positioned, four to six weeks previously, that they will be certain whether the specific intervention recommended was the most appropriate treatment (Figure 5).

It is often helpful for students to take photographs of the patient before any treatment is actually done, to assess the effects of the last treatment ministrations. The photos can then be taken when the treatment for that visit is complete to start the cycle again. Maximizing the number of photographic stages will help the student profit from the learning experience at each and every visit.

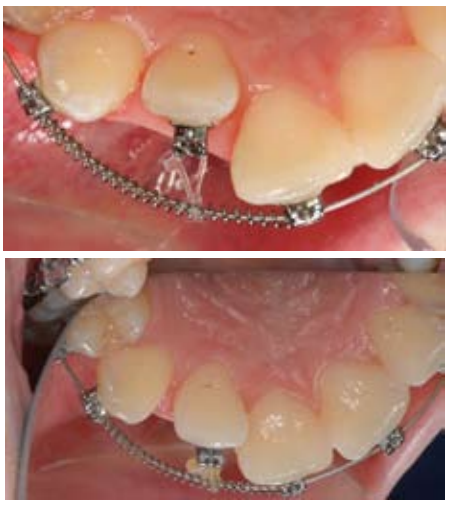


Figure 7. (a, b) Effect of light elastic on instanding tooth over 4 weeks can be seen.

Intercepting treatments not progressing normally

If spaces are not closing as expected, then a study of sequential photographs reveals:

- The method chosen for space closure;
- The dimension of wire used on which to close;
- The method of tying the teeth to the archwire; and
- The forces applied to the teeth.

All of these points give clues as to why things are 'off course'.

If overbite reduction is one of the main aims of treatment, in addition to the clinical measurements recommended at every visit, the photographs can also give clues as to the speed and efficiency of the particular treatment approach. In cases where there is scant regard to routinely taking clinical measurements and photographs, orthodontic cases can often drag on beyond the second year into a third and even a fourth year of treatment.

If the hard tissues or soft tissues are victims of detrimental pressures, it is also of great benefit to document this and issue any necessary advice before unfounded accusations are made. The fact that a lip stud had led to marked gingival recession could only be demonstrated to the patient by comparing before and after photos of the affected area (Figure 6a-c).

The second set of photographs may be required when new mechanics are introduced to a patient, so that the student can subsequently witness the direct effects of this latest intervention (Figure 7a, b).

It is still essential to make routine clinical measurements on a visit-by-visit basis and formally record these clinical measurements on a measurement sheet within the notes (Figure 8). If there is little or no tooth movement in any particular clinical case, it is only with reference to these sequential photographs that potential reasons for this lack of progress can be identified.

To maximise the learning experience for trainees

When orthodontic trainees are developing their skills they need to review all the cases under their clinical care regularly. They need to recognize not only which cases are going particularly well and identify potential exam cases, but equally important is to identify the cases that are going badly. The beauty of orthodontics is that the reason for every effect of treatment can usually be discovered after careful examination of the clinical records. Sequential photographs throughout treatment, perhaps on a six-weekly basis, is an invaluable teaching and learning aid and the trainee will soon appreciate the benefits of a particular clinical approach, compared with other approaches, which produce less convincing results.

It is also of benefit to trainees to take detailed photographs of when things are going wrong during treatment, or when particular appliance systems break (Figure 9a-c). This will act as further reinforcement for the student and the teacher as to the most and least efficient and effective methods of providing treatment.

Trainees need to identify cases for their final presentation. It is only by regularly taking photographs of all of their patients that they will end up with a decent pool of patients from which they will choose potential examination material. It is impossible from the outset to identify the specific patients that are going to turn out well and vice versa. This therefore means that the same high standard of photography must be carried out for each patient.

Medico-legal requirements

Whilst 20 years ago it was virtually unheard of for the doctor or dentist to be sued, the 'litigation culture' has, regrettably, finally reached the United Kingdom. Twenty-three years ago a seminal moment in our career was to go to the 'Bennett and McLaughlin' Straight Wire Course in London. At this course Richard McLaughlin presented his Californian patient consent form, which consisted of

STRAIGHT WIRE RECORD SHEET

NAME: Emily Sizer Patient Ref No.....

Date	18/5/05	1/7/05									
Overjet (tooth#) (mm)	2.5	5.0									
Overbite (mm)	2	4									
Centreline (mm)	—/—	—/—	—/—	—/—	—/—	—/—	—/—	—/—	—/—	—/—	—/—
Reverse Overjet (mm)											
Upper / I-C Width (mm) / Lower											
Left / Canine Relationship / Right											
Upper / I-M Width (mm) / Lower											
Left / Molar Relationship / Right											
Spaces (mm)			—/—	—/—	—/—	—/—	—/—	—/—	—/—	—/—	—/—
? / Archwire / ?											
Elastics	—/—	—/—	—/—	—/—	—/—	—/—	—/—	—/—	—/—	—/—	—/—
E.O.T. requested/worn											
Photos											
Oral Hygiene (1 – 10) 1 = poor, 10 = fantastic		4.									
Comments											

Figure 8. In addition clinical measurement sheets are essential.

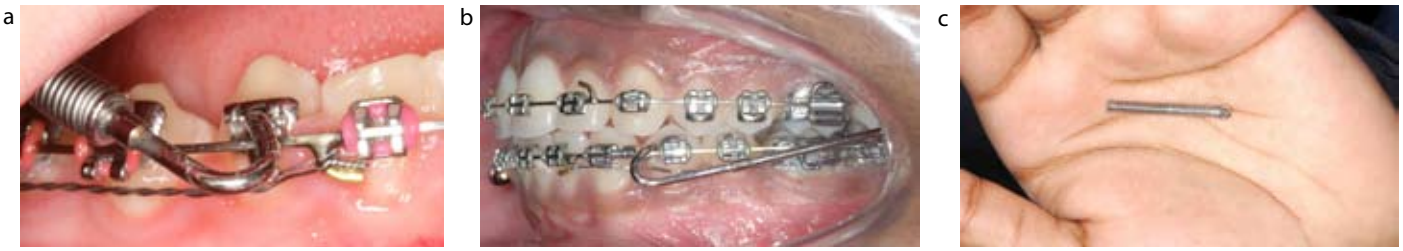


Figure 9. (a-c) Problems arising with a particular clinical technique can be amply demonstrated.

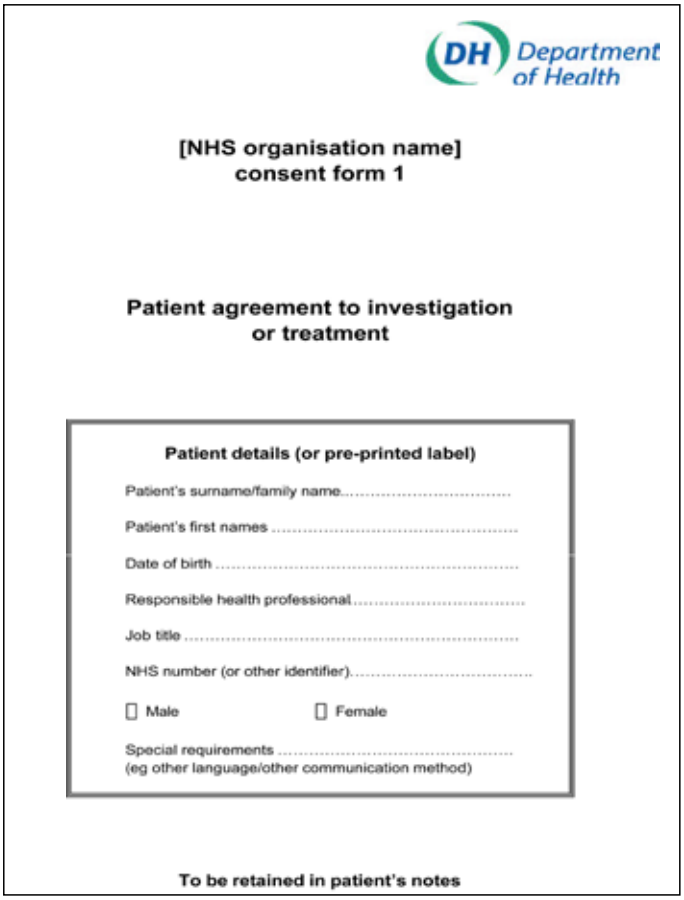
four pages of A4 single-spaced consent for clinical treatment. If, today, you look on the Department of Health Website for Consent Forms for Out-Patient Treatment, you will see a not dissimilar four page document (Figure 10).

Sadly, in the intervening 23 years the United Kingdom has turned into the USA and the 'compensation culture' has finally reached these shores. It is absolutely imperative these days to spend a significant amount of time explaining treatment to the patients, warning them of all the things that could possibly go wrong during a course of orthodontic treatment. You must also write in the notes that the consent has been taken, detailing on the consent sheet specific items that have been discussed. In addition to the written consent form, clinical photographs provide an accurate record of the initial clinical situation, and there can never be any argument as to how severe the original malocclusion was, or what changes have occurred through treatment.

Communication with the courts

With the burgeoning increase in the number of legal cases all of us will be asked at some point to provide an 'Expert Witness' report. Indeed, both of the authors report that they have done more medico-legal work in the last three years than the preceding 23 years. Lawyers are encouraging patients to sue if they feel they are 'the victim of medical negligence' and there is only ever going to be an increase in this practice.

Possessing high quality clinical photographs provides an extremely useful record from which a great deal of information can be gained. These photographs will provide the courts with the information they require to make the appropriate decisions



Department of Health

[NHS organisation name]
consent form 1

Patient agreement to investigation or treatment

Patient details (or pre-printed label)

Patient's surname/family name.....

Patient's first names .....

Date of birth .....

Responsible health professional.....

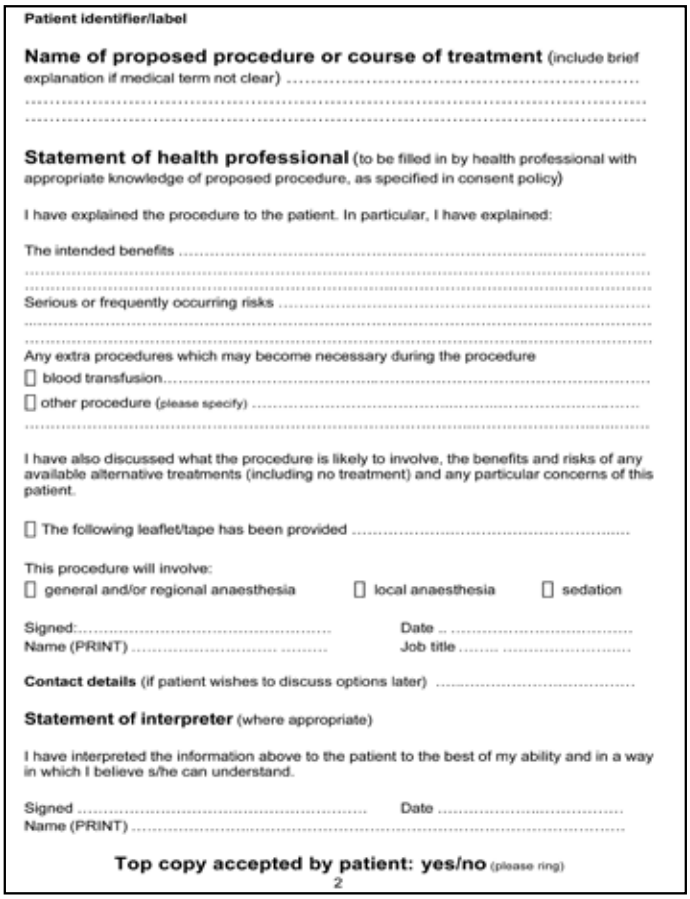
Job title .....

NHS number (or other identifier).....

☐ Male ☐ Female

Special requirements .....
(eg other language/other communication method)

To be retained in patient's notes



Patient identifier/label

Name of proposed procedure or course of treatment (include brief explanation if medical term not clear) .....

Statement of health professional (to be filled in by health professional with appropriate knowledge of proposed procedure, as specified in consent policy)

I have explained the procedure to the patient. In particular, I have explained:

The intended benefits .....

Serious or frequently occurring risks .....

Any extra procedures which may become necessary during the procedure

☐ blood transfusion.....

☐ other procedure (please specify) .....

I have also discussed what the procedure is likely to involve, the benefits and risks of any available alternative treatments (including no treatment) and any particular concerns of this patient.

☐ The following leaflet/tape has been provided .....

This procedure will involve:

☐ general and/or regional anaesthesia ☐ local anaesthesia ☐ sedation

Signed:..... Date .. ..
Name (PRINT) ..... Job title ....

Contact details (if patient wishes to discuss options later) .....

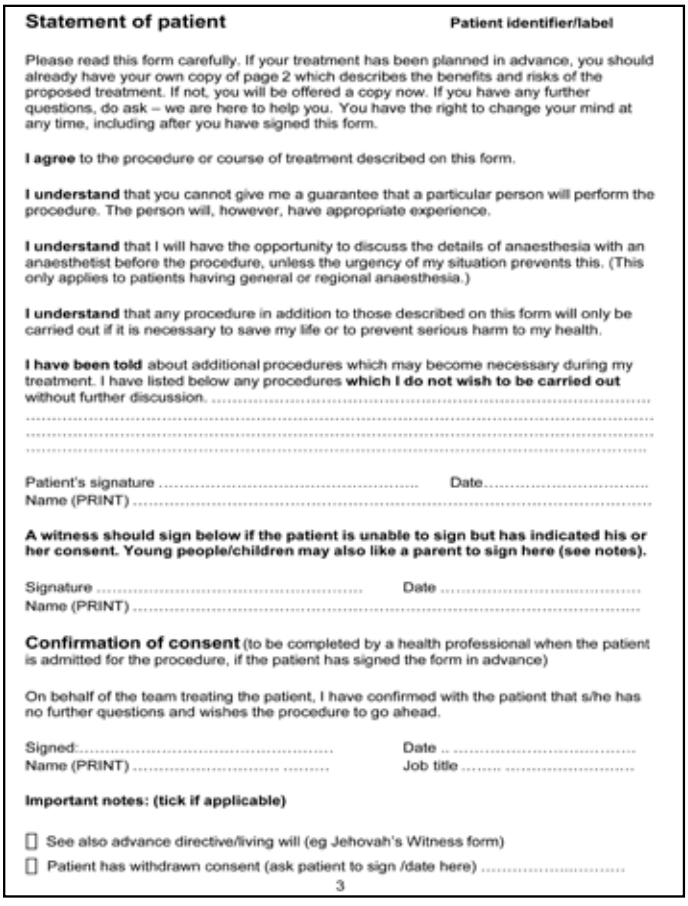
Statement of interpreter (where appropriate)

I have interpreted the information above to the patient to the best of my ability and in a way in which I believe s/he can understand.

Signed ..... Date .....
Name (PRINT) .....

Top copy accepted by patient: yes/no (please ring)

2



Statement of patient **Patient identifier/label**

Please read this form carefully. If your treatment has been planned in advance, you should already have your own copy of page 2 which describes the benefits and risks of the proposed treatment. If not, you will be offered a copy now. If you have any further questions, do ask – we are here to help you. You have the right to change your mind at any time, including after you have signed this form.

I agree to the procedure or course of treatment described on this form.

I understand that you cannot give me a guarantee that a particular person will perform the procedure. The person will, however, have appropriate experience.

I understand that I will have the opportunity to discuss the details of anaesthesia with an anaesthetist before the procedure, unless the urgency of my situation prevents this. (This only applies to patients having general or regional anaesthesia.)

I understand that any procedure in addition to those described on this form will only be carried out if it is necessary to save my life or to prevent serious harm to my health.

I have been told about additional procedures which may become necessary during my treatment. I have listed below any procedures **which I do not wish to be carried out** without further discussion. .....

Patient's signature ..... Date.....
Name (PRINT) .....

A witness should sign below if the patient is unable to sign but has indicated his or her consent. Young people/children may also like a parent to sign here (see notes).

Signature ..... Date .....
Name (PRINT) .....

Confirmation of consent (to be completed by a health professional when the patient is admitted for the procedure, if the patient has signed the form in advance)

On behalf of the team treating the patient, I have confirmed with the patient that s/he has no further questions and wishes the procedure to go ahead.

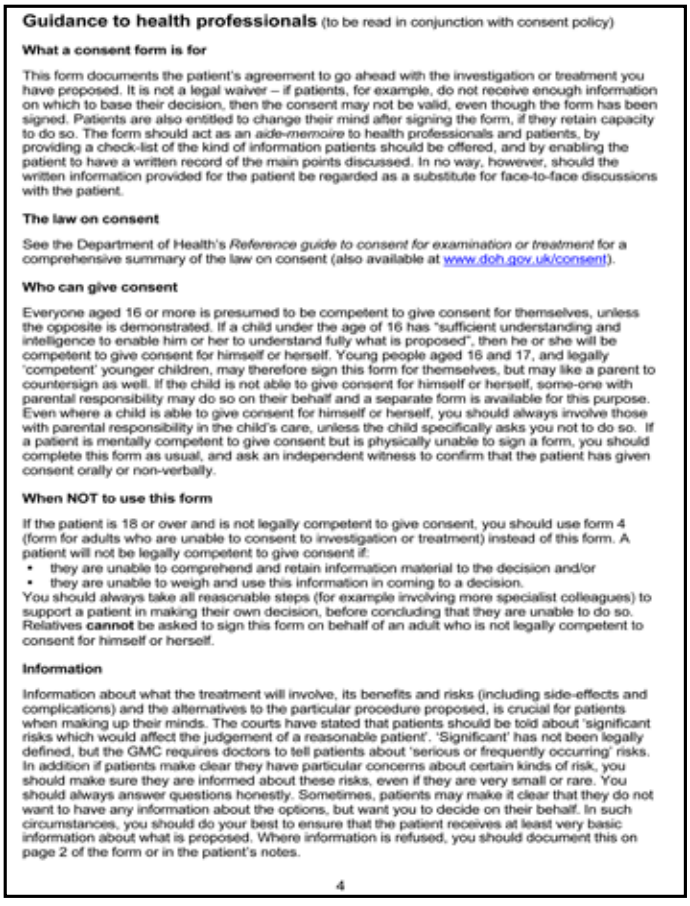
Signed:..... Date .. ..
Name (PRINT) ..... Job title ....

Important notes: (tick if applicable)

☐ See also advance directive/living will (eg Jehovah's Witness form)

☐ Patient has withdrawn consent (ask patient to sign /date here) .....

3



Guidance to health professionals (to be read in conjunction with consent policy)

What a consent form is for

This form documents the patient's agreement to go ahead with the investigation or treatment you have proposed. It is not a legal waiver – if patients, for example, do not receive enough information on which to base their decision, then the consent may not be valid, even though the form has been signed. Patients are also entitled to change their mind after signing the form, if they retain capacity to do so. The form should act as an *aide-memoire* to health professionals and patients, by providing a check-list of the kind of information patients should be offered, and by enabling the patient to have a written record of the main points discussed. In no way, however, should the written information provided for the patient be regarded as a substitute for face-to-face discussions with the patient.

The law on consent

See the Department of Health's *Reference guide to consent for examination or treatment* for a comprehensive summary of the law on consent (also available at www.doh.gov.uk/consent).

Who can give consent

Everyone aged 16 or more is presumed to be competent to give consent for themselves, unless the opposite is demonstrated. If a child under the age of 16 has "sufficient understanding and intelligence to enable him or her to understand fully what is proposed", then he or she will be competent to give consent for himself or herself. Young people aged 16 and 17, and legally 'competent' younger children, may therefore sign this form for themselves, but may like a parent to countersign as well. If the child is not able to give consent for himself or herself, some-one with parental responsibility may do so on their behalf and a separate form is available for this purpose. Even where a child is able to give consent for himself or herself, you should always involve those with parental responsibility in the child's care, unless the child specifically asks you not to do so. If a patient is mentally competent to give consent but is physically unable to sign a form, you should complete this form as usual, and ask an independent witness to confirm that the patient has given consent orally or non-verbally.

When NOT to use this form

If the patient is 18 or over and is not legally competent to give consent, you should use form 4 (form for adults who are unable to consent to investigation or treatment) instead of this form. A patient will not be legally competent to give consent if:

- they are unable to comprehend and retain information material to the decision and/or
- they are unable to weigh and use this information in coming to a decision.

You should always take all reasonable steps (for example involving more specialist colleagues) to support a patient in making their own decision, before concluding that they are unable to do so. Relatives **cannot** be asked to sign this form on behalf of an adult who is not legally competent to consent for himself or herself.

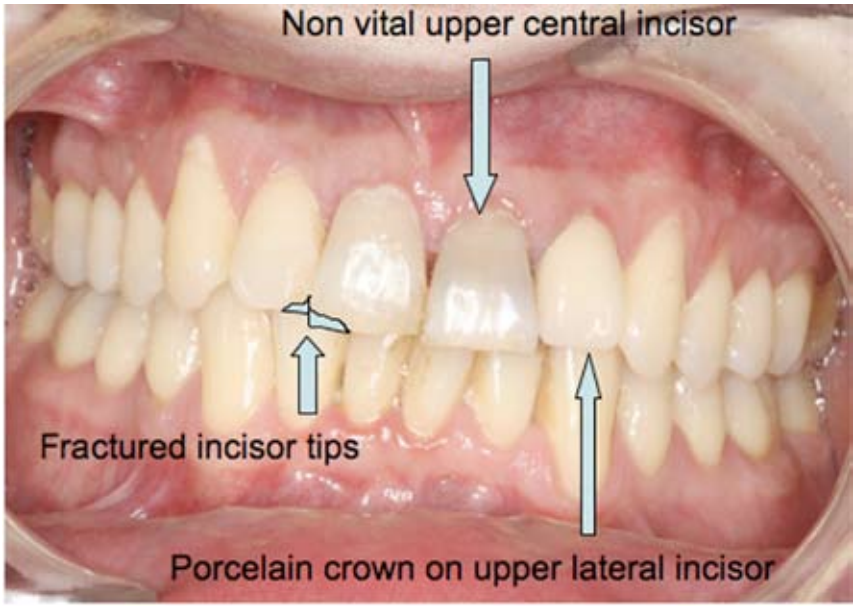
Information

Information about what the treatment will involve, its benefits and risks (including side-effects and complications) and the alternatives to the particular procedure proposed, is crucial for patients when making up their minds. The courts have stated that patients should be told about 'significant risks which would affect the judgement of a reasonable patient'. 'Significant' has not been legally defined, but the GMC requires doctors to tell patients about 'serious or frequently occurring' risks. In addition if patients make clear they have particular concerns about certain kinds of risk, you should make sure they are informed about these risks, even if they are very small or rare. You should always answer questions honestly. Sometimes, patients may make it clear that they do not want to have any information about the options, but want you to decide on their behalf. In such circumstances, you should do your best to ensure that the patient receives at least very basic information about what is proposed. Where information is refused, you should document this on page 2 of the form or in the patient's notes.

4

Figure 10. DoH consent form from the internet.

a



b

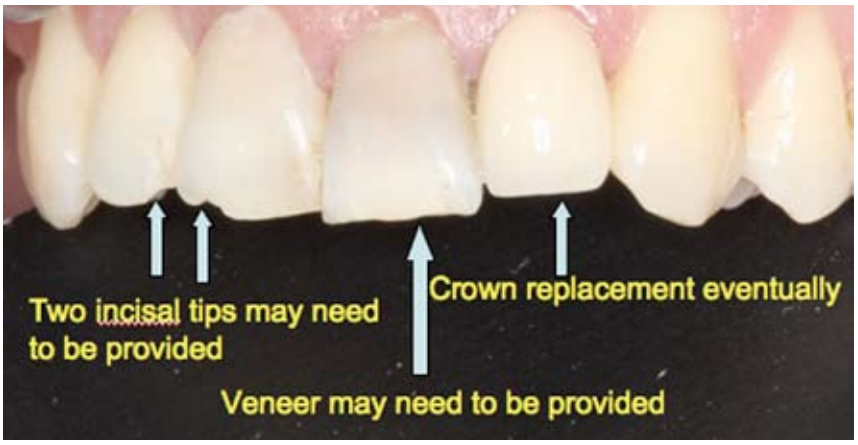


Figure 11. (a, b) Annotated photographs help lay people understand the issues.

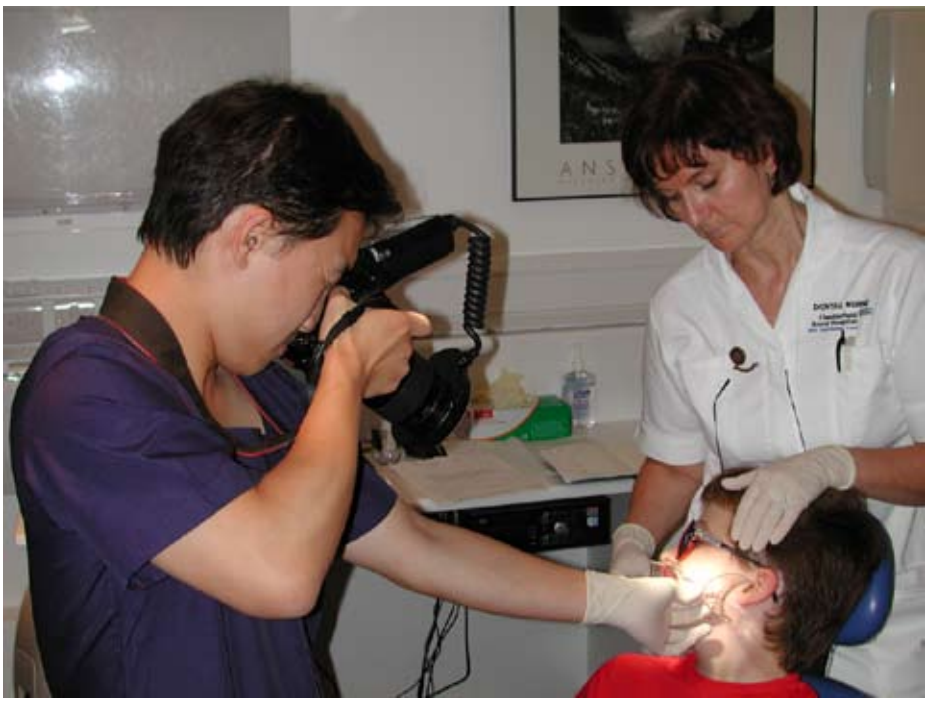


Figure 12. Damage to the teeth during treatment should be documented.

and award the appropriate levels of compensation to the patients.

The most helpful tool in many of these legal reports, to allow non clinicians to understand the nature and the extent of the clinical problems, is to include high quality annotated clinical photographs (Figure 11a, b). This will easily allow all the parties associated with the case to appreciate fully the magnitude of the aesthetic detriment to the injured party, which should lead to a swifter settlement, which has to be in most people's best interest.

Pre-existing condition recorded accurately

If there are any initial problems with the teeth from the outset these can be recorded accurately on the clinical photographs. Examples of this could be any cracks within the enamel, fractures of incisal edges and demineralization.

At the end of the course of treatment, if there have been any detrimental effects on the teeth, it is also useful to record this photographically and to discuss this in some detail with the patient and record the discussion in the clinical notes. This would particularly apply to areas of demineralization or any damage to the tooth surface that has occurred or worsened as a result of treatment (Figure 12). It is useful to discuss all the options with the patient, their parents and the general dental practitioner and once again record that all options have been discussed.

Conclusions

This first section has described the benefit of taking photographs and the uses to which they can be put. The next section will give practical information about how to obtain the high quality results to which we all aspire.

CPD Answers for April 2010

1. A
2. C
3. C
4. A, C, D
5. A, B, D
6. A, B, C
7. B, C D