



BDA CASE MIX MODEL

Training Pack

This pack contains the following sections:

1. The Case Mix Model – a users guide
 - Introduction.
 - Criteria and scoring
 - Recording and Analysis
 - Case Mix Data Form
 - Frequently asked questions
 - References
 - Acknowledgements
 - Appendix – working group terms of reference
2. The case mix model
3. Case mix scenarios
4. Guidance for commissioners

THE CASE MIX MODEL- A USERS GUIDE

Introduction

Guidance on commissioning for special care dentistry recommends that commissioners appraise themselves of the complex needs of many patients accessing special care dentistry as such contracts must reflect the additional time and resources required to provide care for this group of patients (BSDH 2006). The Department of Health in its publication 'Valuing Peoples Oral Health' recommends that commissioners need information regarding the degree of difficulty in carrying out dental treatment, based on the individual's impairment or disability and the impact this has on providing a responsive service.

This case mix model is a tool designed to measure patient complexity by using a system of identifiable criteria applied to a weighted scoring system. The model identifies the various

challenges patient complexity can present dental services (such as difficulties in communication or co-operation). These may result in the need for a greater length of time or additional staff to provide care for a particular patient, in comparison to an average member of the population, irrespective of which contract currency is in use to monitor the dental work undertaken.

This model provides a methodology of describing those complex needs, which can then be used to inform contracts. In time it is expected that its use will become widespread across the country and across different models of dental service provision including secondary care and independent contractors. This will enable commissioners to benchmark the services provided to their local special needs population and ensure that the services commissioned provide for a full range of these patient's needs in a way that demonstrates value for money. It is intended that it be used as one of a number of measures to ensure adequate provision of services for this client group.

The model ranks the complexities presented, and a provisional weighting system has been applied to enable comparisons to be made, for example between different clinician's caseloads, different clinics, and in time across different services.

Each individual patient episode of care is measured separately, and as such it is anticipated that an individual patient will score differently for different episodes of care reflecting the complexity related to the nature of that episode. In this respect the model is more sensitive than a 'patient label' in that it reflects the actual level of resource required and not a theoretical level that is only needed when the patient actually needs active treatment.

Usage of the model is not restricted solely to primary dental care or to the UDA system currently operating in England and Wales. **It is important to emphasize that this is a tool to measure patient complexity. It is not intended to reflect or be used to give weight to the complexity of the *dentistry* undertaken.**

A trial involving 25 salaried primary dental care services in England and Wales was carried out over 2006/2007. With nearly all Strategic Health Authorities represented, data from 8500 patient episodes of care was submitted and analysed. Questionnaires were sent to participating services of which 68 were completed and returned with positive feedback on the model overall. The results helped inform the development of the following criteria and scoring methods.

Criteria and scoring

This model identifies six independent criteria that, either solely or in combination, indicate a measurable level of patient complexity. Each criteria covers both actual provision of clinical care for the patient, and the many additional pieces of work needed to facilitate care for many of these patients.

- i. Ability to communicate**
- ii. Ability to co-operate**
- iii. Medical status**
- iv. Oral risk factors**
- v. Access to oral care**
- vi. Legal and ethical barriers to care**

Each of the criteria is independently measured on a 4 point scale where 0 represents an average fit and well child or adult attending for dental care, and A, B and C represent increasing levels of complexity. The complexity may be related to the actual provision of care and/or the many additional actions necessary to facilitate care for such patients.

The criteria and the scores given relate to a course of treatment (episode of care), and will normally be assessed when a course is either completed or discontinued. There will be an element of subjectivity in assessing the scores, but this pack aims to provide you with enough information to serve as a 'best guide' model.

Specific notes regarding each criteria:

i) Ability to communicate

This criterion is intended to reflect issues of communication between the dental team and the patient while in the surgery. (Note: communication regarding appointment etc is covered under Access). Such communication may be direct between staff and patient, or may require the need for a third party to act as interpreter, advocate etc.

ii) Ability to co-operate

This criterion is intended to reflect circumstances wherein patient co-operation affects the delivery of dental care. It may be expected that clinicians with differing patient management skills may score an individual differently in respect of this criteria, or patients may vary between appointments. The grade given should reflect the average experience over a course of treatment. The definitions regarding length of appointment and behaviour

modification are intended as guides only. The highest grade C is reserved for cases involving general anaesthetic as this reflects also the greater numbers of staff necessary to provide care in these instances

iii) Medical Status

This criterion is intended to reflect circumstances wherein the patient's medical history influences the course of treatment. It also covers those circumstances where a patient's medical history is not readily obtainable, and the dental team need to undertake further enquiries or investigations before treatment can proceed. Grade C is reserved for those cases requiring time and resources of non-dental members of the health care team.

iv) Oral risk factors

This criterion aims to complement and not replace the UDA tool now in use in England and Wales. As such, the technical complexity of the dentistry provided is not relevant in assessing oral risk factors. It is acknowledged that some patients may have specific risk factors which require a higher than average resource be allocated to their care. Examples include working with carers or patients themselves in mitigating risk factors, the amount of treatment necessary to maintain oral health, or specific oral issues making provision of dental care more complex.

v) Access to oral care

This criterion aims to reflect complexities surrounding patient access to care at any point during the course of treatment. The criterion takes into account any obstacles created by the patients themselves that would hinder their access to dental care, e.g. persistent failure to attend. Grade 'C' is reserved for provision of care in a domiciliary setting or equivalent.

vi) Legal and ethical barriers to care

This criterion reflects other barriers to care not otherwise covered in the previous 5. Two of the most common are the time spent in consultation with 3rd parties to obtain consent to treat, and the difficulty identifying the financial status of some patients and thus eligibility for free treatment. This criteria should also be used when resource is necessary for other reasons to consult with guardians, advocates, or seek the opinion of a court of law for example. The highest grade C is reserved for case conferences or equivalent where a multi-professional team needs to be consulted before care can proceed.

Note that separate legal and ethical criteria are produced for Scotland to reflect differences in the legislation there with regard to adults unable to consent for themselves.

Recording and Analysis

i) Recording

A record should be made per course of treatment, and reflect the complexity presented by the patient specific to that course of treatment. It is important that all 6 criteria are judged and recorded for each episode of care.

As a rule it is recommended that the record is made at the end of a course of treatment, and reflects all activity required to complete that course. Where it is necessary to make a recording part way through a course (for example, if more than one operator is involved) it is important that the records are reviewed and, if necessary, amended at the end of the course.

Data capture methodology is available on both dental software systems commonly in use in primary dental care in the UK. Use of such systems enables grades given to be reviewed regularly, allows recording to be made mandatory prior to completion and enables alternate methods of analysis to be undertaken with the original data. Where such electronic data capture is not available it is necessary to determine the analysis required prior to design of a data capture form. An example form used in the main field trial is included in this pack, and should be adapted to facilitate the analysis required in each local situation.

ii) Provisional Weightings

In order to facilitate analysis the criteria have been assigned weightings based upon the opinion of a group of experienced clinicians in the BDA working group. In the field trial both quantitative and qualitative analysis of the main data demonstrated some validity to these provisional weightings. It can however be anticipated that with the introduction of electronic data capture and analysis, widespread use and benchmarking between services, future evidence may demonstrate a need for some adjustment. This is an area requiring further research.

	0	A	B	C
Ability to communicate	0	2	4	8
Ability to co-operate	0	3	6	12
Medical status	0	2	6	12
Oral risk factors	0	3	6	12
Access to oral care	0	2	4	8
Legal and ethical barriers	0	2	4	8

iii) Analysis

There are two recommended methods of analysis:

- a) Based on the banded total score
- b) Based on the maximum score

Both these methodologies have been built into the two dental software systems. It is anticipated that with more widespread usage further recognised methodologies for the most commonly used analyses will develop.

a) Banded total score

The weighting scores across all six criteria are summed to give a total score for each course of treatment. These are then allocated to one of the bands below, and the case mix can subsequently be analysed by calculating the numbers and percentage in each band, split into different cells as appropriate e.g. whole service; different age groups; different clinics; different operators.

Total Score

0	Standard patient
1-9	Some complexity
10-19	Moderate complexity
20-29	Severe complexity
30+	Extreme complexity

In the field trial this methodology clearly demonstrated a full range of variations in case mix between different operators and clinics within the same service. Thus, it would be equally appropriate to use this to benchmark one service against another though it is worth noting this would be sensitive to operators using all 6 criteria appropriately.

b) Maximum score

Of the six criteria used in the scoring, only the most complex criteria would be used in this analysis. For example, a patient requiring GA would be analysed as a 'C' category patient, irrespective of the scores for the other five criteria. While such analysis is simpler than the banded score method, the field trial demonstrated that the maximum score method was markedly less effective in highlighting the differences in case mix between operators. Such methodology is however being used in some locations to develop referral criteria, or demonstrate compliance with patient acceptance or discharge criteria.

Case Mix Data Capture Form

Patient identifier	This can be a unique patient identifier for your service, or if no identifier exists, a simple numerical count 1, 2, 3, 4 etc.
Age group	Please tick the appropriate column.
Case Mix score	Using the narrative as a guide, please insert a score (0, A, B or C) against each of the six criteria
Comments	Please add any brief comments that you may wish to feedback to us regarding the scores given (For more complex cases, see following page).

Case Mix Data Capture Form

[illegible]

Frequently asked questions

Every episode of patient care may not easily fit within this scoring system and common sense will be necessary in some cases. It should be remembered that the system is intended to inform clinicians, managers and commissioners of the complexity of the patients cared for within a service. It does not describe the experience of the practitioners carrying out the care and although an information pack is available for use the system does not rely on standardisation of clinicians.

Bearing this in mind, the following are the most commonly asked questions from clinicians using the system.

Q. What about patients referred for management of severe trauma and dental anomalies? Shouldn't they receive high scores?

A. Not necessarily. This system is intended to identify issues relating to the impairment and/or disability of the patient and not to the complexity of their individual dental problems.

Q. How would I reflect the time taken for full mouth rehabilitation which is very time consuming?

A. This should be recorded using different criteria. This system is intended to identify issues relating to the impairment and/or disability of the patient and not to the complexity of their individual dental problems.

Q. What about patients who need extended courses of treatment because of neglect? They are very time consuming and may not score very highly?

A. They will only score highly if they have specific impairment or disability affecting their care or they may score highly in the 'oral risk factor' section, A high score is not justified on the basis of high treatment need. This system is intended to identify issues relating to the impairment and/or disability of the patient and not to the complexity of their individual dental problems.

Q. How would I score a very quick examination in a patient with profound learning disability or dementia which is difficult but may not take long?

A. Such a patient is likely to score highly because of their lack of co-operation, and possibly would score highly in the categories of Communication (need to communicate with carers) and Law and Ethics (issues around capacity to consent).

Q. How should we record DNA appointments – especially for long appointments. Similarly what about DNAs where carers are unable to bring patients, or patients are not at home for domiciliary visits, all very time consuming.

A. It is not intended that this system be used to monitor missed appointments. Separate systems should be devised for this purpose.

Q. Some patients are easy to examine but not so easy to treat! How would we record this?

A. Since we are recording episodes of care any lack of co-operation for treatment would be recorded. Such a patient may also score in other categories eg need to communicate through carers or difficulties obtaining consent/medical history. If no treatment is required it may be that a low score would be appropriate since the impairment /disability has not affected that particular episode of care.

Q. What about inpatients with who need to be treated in a hospital environment where there is no surgery?

Anyone treated outside a 'surgery' environment should be seen as a 'domiciliary' visit and scored accordingly. Any medical condition should be scored using the appropriate 'medical status' score.

Q. How would you score a child who can communicate but the parents cannot?

A. Generally the communication of the child would be scored as normal. However if the communication /understanding of the parent is impaired this may well affect the 'legal/ethical' score relating to consent or provision of medical/social history.

Q. Some of our patients need to visit more frequently and need more input e.g. therapist and hygienist support.

A. These patients would presumably receive more than the average number of episodes of care which would be scored as any other episode. The system does not measure the length of episodes. Separate systems should monitor this.

Q. Many of our patients are only treated after years of seeing the same clinician or because of the experience of that clinician. A new dentist may see a patient differently. How can we score this?

A. The score most affected in this scenario, is that of co-operation and perhaps communication in some cases. The score should be related to the clinician treating the patient. It may be that more experienced clinicians would have different individual profiles

from those with less experience. This might be expected within individual services but also depends on the complexity of the patients, i.e. more experienced clinicians may care for more complex cases.

Q. We have no reception staff at our clinic. How can we record the increased time needed in such a situation?

A. This does not relate to the impairment and disability of the patient and would not be recorded using this system.

Q. I have a patient who wears a fixed orthodontic appliance and finds it difficult to keep it clean because of his disability. How should I record this?

A. The score which should describe the problem here relates to the oral hygiene and thus the oral risk factors but not to the appliance itself since there is no indication that the patient's disability affects the appliance therapy.

Q. I need to talk to someone else before I can proceed with treatment. How should I code this?

A. Each code relates to one episode of care so once the episode is complete a decision can be made about how much consultation was required. If it was about the impact of the medical/disabling condition and multidisciplinary review was required the appropriate Code C would be used under medical status. If however consultation is about consent or a looked after child the appropriate code would be found under legal and ethical barriers.

Q. How would I score a GA referral?

A. The code used relates to one episode of care. Once a patient is referred for a GA this becomes a new episode of care. The examination would be scored normally and the appropriate code (C) under Ability to Co-operate would be used

References

Griffiths J, Lewis D. Guidelines for the oral care of patients who are dependent, dysphagic or critically ill. J Disabil Oral Health 2002 **3**: 30-33.

British Society for Disability and Oral Health. Principles on intervention for people unable to comply with routine dental care: a policy document. 2004 www.bsdh.org.uk

British Society for Disability and Oral Health. Guidelines for the oral management of oncology patients requiring radiotherapy, chemotherapy and bone marrow transplant. J Disabil Oral Health 2001 **2**: 3-14.

British Society for Disability and Oral Health. Oral health care for people with mental health problems: Guidelines and recommendations. Report of BSDH working group. 2000 www.bsdh.org.uk

Griffiths J. Guidelines for oral health care for people with a physical disability. J Disabil Oral Health 2002 **3**: 51-58.

British Society for Disability and Oral Health and the Royal College of Surgeons of England. Clinical Guidelines and Integrated Care Pathways for the Oral Health Care of People with Learning Disabilities. 2001 www.bsdh.org.uk

Fiske J, Griffiths J, Jamieson R et al. Guidelines for oral health care for long stay patients and residents. Gerodontology 2000 **17**: 55-64.

British Society for Disability and Oral Health. Development of Standards for Domiciliary Dental Care Services: Guidelines and recommendations. 1999 www.bsdh.org.uk

British Society for Disability and Oral Health. Prepared by a Working Group of the Teachers Group of BSDH. Developing an Undergraduate Curriculum in Special Care Dentistry. 2004 www.bsdh.org.uk

British Society for Disability and Oral Health. Commissioning Tool for Special Care Dentistry. Produced by BSDH and funded by the Department of Health. 2006 www.bsdh.org.uk

Department of Health. Valuing people's Oral Health. A good practice guide for improving the oral health of disabled children and adults. 2007

All Wales Special Interest Group – Special Oral Health Care. Guidelines for the delivery of a Domiciliary Oral Health Service. J Disabil Oral Health 2006 **7** 166-172.

Acknowledgements

The BDA working group responsible for developing and testing the model comprised

Peter Bateman	Clinical director, Sheffield SPDCS
Christine Arnold	Senior community dentist, Halton SPDCS
Louise Foster	Senior community dentist, Cotswold and Vale SPDCS
Sue Greening	Specialist in paediatric dentistry, Gwent CDS
Nigel Monaghan	Consultant in Dental Public Health, NPHS Wales
Liana Zoitopoulos	Consultant in special care dentistry, Kings School of Clinical Dentistry

The group would like to thank:

- Janet Clarke and members of CCCPHD for commissioning the work.
- Karen Gordon for advice on the legal and ethical criteria as they pertain to Scotland
- Members of the following societies for their invaluable comments and suggestions during development of the model-
 - British Society for Disability and Oral Health
 - British Association for the Study of Community Dentistry
 - BDA CDS Group Management committee.
- The staff of the following salaried primary dental care services who participated in the field trial and contributed to the subsequent evaluation- Airedale; Vale of Aylesbury; Blackwater Valley and Hart; Bradford; Bromley; Calderdale and Kirklees; Cotswold and Vale; Doncaster; East Elmbridge and Mid Surrey; Gwent; Halton; Hambledon and Richmond; Mid Hampshire; Leeds; Lincolnshire; North Derbyshire; North Lincolnshire; Oxfordshire; Sheffield; Shropshire; Solihull; Southampton; Surrey Heath and Woking; Wiltshire; Wycombe.

Appendix

BDA WORKING GROUP TERMS OF REFERENCE

- To develop and instrument for use in measuring the complexity of providing dental care for patients of the Salaried Primary Dental Care Services. (SPDCS).
- To field test the instrument in a range of SPDCS in (?) England and Wales.
- To calibrate the instrument such that it recognises the range of complex patient management issues experienced by SPDCS practitioners.
- To make the instrument available to SPDCS for local use in commissioning, contracting, and performance monitoring situations.

In developing the instrument it is expected that it will be used alongside 'Units of Dental Activity' or any similar tool in use within the NHS to assess the actual dental care provided. The instrument is intended to supplement any such tool by enabling SPDCS dental teams to factor in an allowance for patient management issues necessary to provide dental care for any particular individual or client group. These may include issues of co-operation, communication or access which have a significant impact on the resource necessary to complete treatment and/or medical or oral risk factors that increase the complexity of providing care.