BRITISH ORTHODONTIC SOCIETY

Clinical Standards Committee

GUIDELINES FOR PRIMARY CARE TRUSTS AND LOCAL HEALTH BOARDS TO ASSESS THE TREATMENT OUTCOME OF PATIENTS TREATED BY SPECIALIST ORTHODONTISTS OR DENTISTS USING THE PEER ASSESSMENT RATING (PAR) INDEX

July 2009

CONTENTS

1. Introduction

The quality and outcome of orthodontic treatment is of prime concern to commissioning authorities and clinicians alike.

The Peer Assessment Rating (PAR) index, developed in 1992 by Richmond *et al.*[1], enables a standardised objective assessment of orthodontic treatment outcome to be made. It is a reliable and valid weighted index[1], which can be used to calculate the degree of improvement of orthodontic cases using start and finish plaster casts of the teeth. It has been applied successfully in the Bedfordshire Orthodontic PDS Pilot[2] to audit outcome and is being adopted as a requirement of the new local orthodontic contracts (post-April 2006).

This guidance is to be used by Primary Care Trusts (PCTs) and Local Health Boards (LHBs) who are required, under the regulations of the New Contract, to audit the treatment outcome (using the PAR index) of patients treated by their local orthodontic specialists.

2. The Assessors

In order to assess cases treated by orthodontic specialists, each PCT and LHB will need to employ an *independent* assessor to ensure unbiased data collection.

It is essential that assessors are properly trained and calibrated in the use of the PAR index. This ensures accuracy, as well as reducing systematic bias and variation between assessors[2]. In some areas calibrated assessors are already available whilst, in others, potential assessors will need to be sought to undergo the appropriate training.

Assessors need not be dentally qualified. It is possible to train non-clinical staff *e.g.* nurses and technicians, to use the PAR index to a high degree of reliability[3]. Non-dentally qualified individuals, however, require additional training in order to understand the dental landmarks. Dentists and Orthodontists have been shown to have the greatest success rates at calibration courses[3]; but the costs to employ this group are greater than employing other dentally trained staff. Dental Nurses or Dental technicians may, therefore, be more suitably placed for further training to become calibrated, although accuracy rates have been shown to be lower amongst dental nurses[4]. No data is available yet regarding the scoring reliability of calibrated dental technicians.

Calibration courses for the PAR index take place annually. Contact details for a suitable calibration course are listed at the end of this document

3. Collecting data

It is appropriate for orthodontists to regularly evaluate the treatment outcome of their clinical work[5]. The first 50 cases, or 10% of the annual caseload (whichever is the greater) should be assessed[5]. The <u>minimum</u> requirement under the New (nGDS/PDS) Contract (April 2006) is that 20 cases plus 10% of the cases over 20 be randomly monitored by PAR. However, each PCT/LHB can increase this minimum target in order to obtain a more accurate picture. The proposed cost is £10 per case. A minimum annual allowance of £500 per year would therefore need to be built into contracts of practitioners using this service.

Ideally, consecutively started treatments should be evaluated. Inclusion criteria are completed cases from <u>all</u> age groups and <u>all</u> treatment types, including any discontinued treatments[6]. Any patients undergoing treatment prior to April 2006 are excluded. In order to PAR score these cases, pre-treatment and post-treatment study models are required for each case.

The Orthodontist is also required to complete a form giving the following essential information for each case:
1. Any impacted teeth.
2. Any missing teeth or extracted teeth.
3. Any plans for prosthetic replacements.
4. Any restorative work previously carried out that affects the malocclusion.

Appendix 1 shows an example of the information form.
Appendix 2 shows a standardised PAR data collection form for each set of models[6].
Appendix 3 lists the currently available software for analysis of collected data
Appendix 4 refers the reader to the national database of orthodontic personnel calibrated in the use of the PAR index.

4. Analysing the data

The pre- and post-treatment PAR scores and reduction (percentage) change are calculated using the data collected. The PAR scores can then be plotted to one of three qualitative categories ("greatly improved", "improved" or "worse/no difference") of outcome using a nomogram [6]. This may be done for individual cases or for groups of cases.
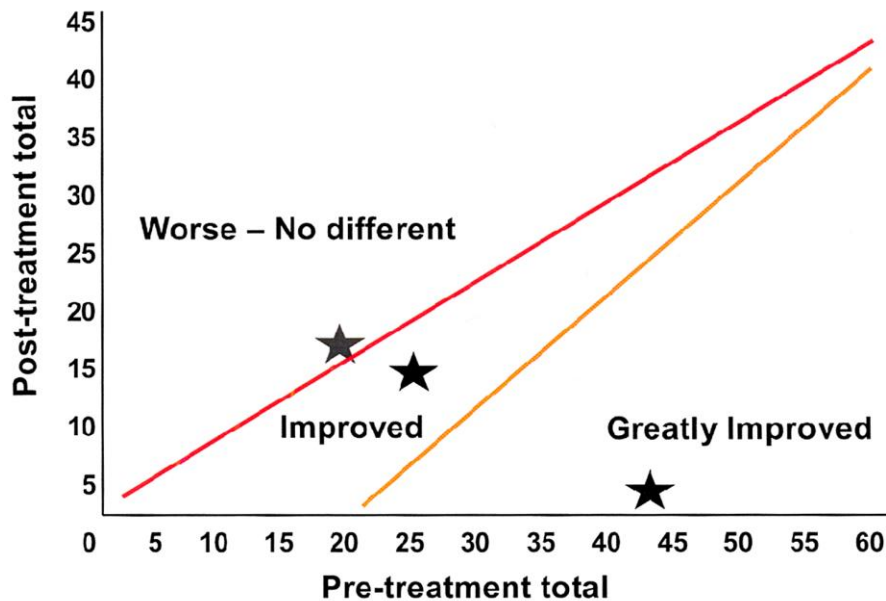
Assessment of improvement PAR

Figure 1: The PAR nomogram

A reduction in the PAR score of at least 30% is required for a case to be considered as being 'improved'[7]. A reduction of 22 PAR points or more shows a 'great improvement'[7].

For a practitioner to demonstrate high standards, the proportion of their caseload falling in the 'worse or no different' category should be negligible[7] (less than 5%[6]), and the mean reduction in PAR score should be high[7] (greater than 70%[7]).

The type of treatment undertaken is likely to influence the outcome[8]. Treatment with simple removable appliances is less likely to produce as much improvement as that seen with fixed appliances[6].

References

1. Richmond S, Shaw W C, O'Brien K D, Buchanan I B, Jones R, Stephens C D, Roberts C T, Andrew M. The development of the PAR index (Peer Assessment Rating): reliability and validity. European Journal of Orthodontics, 1992, 14, 125-139.
2. C. J. R. Kettler. The Bedfordshire PDS Orthodontic Pilot. Journal of Orthodontics, 1999, 26, 342-345.
3. Richmond S, Buchanan I B, O'Brien K D, Andrews M, Roberts C T, Turbill E A. Calibration of dentists in the use of occlusal indices. Community Dentistry and Oral Epidemiology, 1995, 23, 173-176.
4. Richmond S, Turbill E A, Andrews M. Calibration of Non-dental and Dental Personnel in the Use of the PAR index. British Journal of Orthodontics, 1993, 20, 231-234.
5. Richmond S. Evaluating Effective Orthodontic Care. First Edition, 2005.
6. Burden D J, Stratford N. Training Dental Nurses in the use of the PAR index: A Pilot Study. British Journal of Orthodontics, 1996, 23, 153-155.
7. Weerakone S, Dhopatkar A. Clinical outcome monitoring program (COMP): A new application for use in orthodontic audits and research. American Journal of Orthodontics and Dentofacial Orthopaedics, 2003, 123, 503-511.
8. Richmond S, Shaw W C, Roberts C T, Andrews M. The PAR index (Peer Assessment Rating): methods to determine outcome of orthodontic treatment in terms of improvement and standards. European Journal of Orthodontics, 1992, 14, 180-187.

Calibration Course in the use of PAR Index

Occlusal Index Course, Dental Health and Biological Sciences, Cardiff University, School of Dentistry, Heath Park, Cardiff, CF14 4XY. Contact Catherine Roberts: Tel (029) 2074 5246, Fax (029) 2074 6489.

Appendix 1

Sample form for completion by Orthodontic Specialists for each case

Please complete the following form and send along with study models

Patient Name   _____

Date of Birth   _____

1. Are there any impacted teeth?

2. Are there any missing teeth?

3. Did the patient have any teeth extracted?

4. Is the patient being providing with a prosthetic replacement for any of the spaces?

5. Has the patient had any restorative treatment affecting the malocclusion?

Appendix 2 [5]

PAR SCORING MATRIX

CASE NUMBER	Pre-treatment									
PAR COMPONENTS	**RIGHT**								**LEFT**	**WEIGHTED TOTAL**
Upper anterior segments	3-2		2-1		1-1		1-2		2-3	X1
Lower anterior segments	3-2		2-1		1-1		1-2		2-3	X1
Buccal occlusion	Antero-posterior		Right		Left					X1
	Transverse		Right		Left					X1
	Vertical		Right		Left					X1
Overjet	Positive			Negative						X6
Overbite	Overbite			Openbite						X2
Centre line										X4
								TOTAL		

CASE NUMBER	Post-treatment									
PAR COMPONENTS	**RIGHT**								**LEFT**	**WEIGHTED TOTAL**
Upper anterior segments	3-2		2-1		1-1		1-2		2-3	X1
Lower anterior segments	3-2		2-1		1-1		1-2		2-3	X1
Buccal occlusion	Antero-posterior		Right		Left					X1
	Transverse		Right		Left					X1
	Vertical		Right		Left					X1
Overjet	Positive			Negative						X6
Overbite	Overbite			Openbite						X2
Centre line										X4
								TOTAL		

PAR SCORE IMPROVEMENT			
Change in PAR Score		Greatly Improved	
% change in PAR score		Improved	
		Worse or No different	

Appendix 3 [6]

Computer software

Currently, there are two commercially available computer software programmes dedicated to the comparison of PAR scores.

1. **COMP** (Clinical Outcome Monitoring Program)[6] is configured to allow collation of collected scores graphical and tabular form suitable for audit. Collection of the data by a calibrated assessor is required. The programme costs £250.00 and is available via the following links:

sisiraweerakone@aol.com

www.compulink.co.uk/~felix/opal/cogsw.html

The first site is that of the author. The second site is linked to the British Orthodontic Society.

2. **ORTHDEX** software. This is a fully updated version of the previously popular ORTHDEX PAR software programme (ORO software, 2001) which was originally distributed by Ortho-Care.

It is now available in two versions:

1. The **web-based version** is available at a cost of £125 per annum which includes telephone support and advice. This is inclusive of VAT and it is available to both PC and Mac users.

The data is held on secure servers and is confidential, fully backed-up and available only to the individual practice which entered the information. The practice can also download the data onto their own computer. Look at: https://www.orthdex.net/index.html

2. The **stand-alone version** is available at a cost of £650 (plus VAT) and is for PC users only. There are no help facilities and no upgrades available with this version.

Contact: EPS, 1 Emperor Way, Exeter Business Park, Exeter, EX1 3QS

Tel: 01392 314024 fax: 01392314001 e-mail: support@epsresearch.com

Appendix 4

A register of calibrated assessors offering a PAR scoring service is held by the BOS. The full list, which is regularly updated, is accessible from the British Orthodontic Society website: http://www.bos.org.uk/researchaudit/theparindex/List+of+Calibrated+PAR+Scorers.htm