

FIONA GRIST

Basic Guide to
ORTHODONTIC
DENTAL NURSING

SECOND EDITION



WILEY Blackwell

Basic Guide to Orthodontic Dental Nursing

Dedication

For Michael,
with love, as always

BASIC GUIDE TO ORTHODONTIC DENTAL NURSING

Fiona Grist

R.D.N., B.A. (Hons) OU



WILEY-BLACKWELL

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Foreword

The role of the orthodontic surgery assistant/nurse in the delivery of orthodontic care is crucial. Every orthodontist relies on his assistant to help with the delivery of orthodontic care. The chairside is the coal-face of orthodontic delivery and the more effective and efficient this aspect of care, the better the orthodontic experience and outcome for the patient.

This book is an ‘all you need to know’ about assisting in orthodontic care delivery and is an invaluable learning tool and reference for all the orthodontic team. The Guide is essential reading for trainees – getting the fundamentals right early on sets a solid foundation for the day-to-day team approach.

The British Orthodontic Society (BOS), whose commitment to education is top of its activity list, welcomes and recommends Fiona Grist’s *Basic Guide to Orthodontic Dental Nursing*. BOS is confident that the guide will provide invaluable instruction for the qualified orthodontic nurse, the general dental nurse and the trainee nurse.

Dr Les Joffe
CEO – *British Orthodontic Society*
July 2010

How to use this book

The aim of this book is to give the dental nurse in general practice an introduction to the world of orthodontics and orthodontic dental nursing. It would also be beneficial for trainee nurses working in an orthodontic environment.

Orthodontics is a specialist branch of dentistry and has its own vocabulary. The information in this book is a basic guide; it does not set out to:

- examine clinical features (why the problem arose)
- cover treatment planning (what is the best choice of treatment)
- treatment mechanics (how the appliances achieve what they do)

Its objectives are to illustrate what the dental nurse needs to understand to be able to work efficiently at the chairside when treating an orthodontic patient.

There are several excellent orthodontic textbooks available if you feel you want to develop your knowledge further. The career pathways for orthodontic dental nurses are now wide and the possibilities are infinite. Nurses have an important place as Dental Care Professionals in the dental team. This book aims to be a helpful first guide on what will hopefully be a long and interesting journey.

When reading this book different procedures for various treatments are outlined. While it is the nurse's role to assist the clinician, there are areas that are their sole responsibility; these are highlighted in the text in italics.

A quick glance into the stock cupboards and cabinets in an orthodontic surgery will reveal quite different contents from that of a general dental surgery. There will be nothing with which to fill teeth or fissure seal, no extraction forceps or root canal trays. Anything that helps to irrigate a periodontal pocket, whiten a tooth, prepare abutments for a bridge or fit veneers will be missing. Cupboards in orthodontic units and practices may share the basics, such as mirrors, probes, College tweezers, and use the same alginates and disposable sundries, but beyond that, they have very little in common. However, these cupboards are full, and it is not possible to cover every method or procedure, or all materials or equipment that is in use.

Just as we had to learn what was needed for restorative, endodontic, and prosthetic procedures we need to learn what is needed for orthodontic treatment, which instruments are used for what procedure and why they are used.

Each chapter will cover a topic, with a short background and guide to what you will need to prepare so that the treatment can be undertaken as efficiently as possible. Where it seems helpful, there are photographic examples, the aim being to show the instruments as clearly as possible. The photographs are not all to the same scale.

This book does not go into detail regarding decontamination and sterilisation. The same procedures and protocols apply in orthodontics as in other specialties. The areas to watch concern the effect repeated sterilisation has on stiffening box joints on pliers. It can have a detrimental effect on pliers that have cutting edges. When sterilising pliers and instruments with beaks, always have the beaks open.

As with every skill, be it orthodontic treatment or baking a cake, everyone will have their individual method of working and their favourite tools. There is no hard and fast rule that says each procedure must be carried out using only certain instruments in the same way, in an exact order. Every clinician has their preferred methods of working and each and every nurse organises the layout of their trays, as they like them. This is as it should be, do what works best for you.

There is a saying,

You don't know what you don't know.

This book contains a lot of information but at the same time there will certainly be omissions. Every day brings new materials, new techniques and new treatment philosophies. Orthodontics is inevitably becoming split into specialties within a specialty. The pace of development and change ensures that what is current today is not tomorrow.

Hopefully, this book will achieve what it sets out to do, which is to provide enough written and visual information for a reasonable grounding of basic knowledge. Its aim is to encourage dental care professionals, especially dental nurses, to understand more about orthodontic nursing.

There is so much that as trained or trainee dental nurses you are already expert at doing, so this book will not cover knowledge you already have or skills you already possess. It is not intended to be comprehensive, rather a basic insight into the world of orthodontic nursing, it is merely a guide.

Acknowledgements

There has been no end to the tremendous support I have received from my husband Michael. He has had faith and unlimited patience. When computers, cameras, and all manner of technology were out to get me, he just quietly sorted it out. I just could not have done it without him, and I never stop telling him this.

Special thanks must go to Alan Hall who kindly gave up many, many hours of his time to look over my shoulder and check that I had not got my clinical wires crossed. Also to Maureen Dickinson who looked over my other shoulder and spent many hours checking that I did not leave out the major facts whilst busily including the minor ones. Thank you both for sharing your expertise so generously and for giving this book the benefit of your time, enthusiasm, experience and knowledge with such graciousness.

There are so many people who I want to thank. David Morris gave permission and his nurses sourced the images for use on the cover, thanks to Julie Heseldene for her phone calls. Steve Jones was kind enough to let me use his photographs of TADs. Paul Ward supplied some of his photographs of lingual appliances. Janet Goodwin at NEBDN was most helpful with permission to reproduce the Certificate of Orthodontic Nursing syllabus. Lisa McDonald at the GDC helped me with permission to use the Syllabus for Orthodontic Therapists. The Occlusal Indices are reproduced by kind permission of Professor Steve Richmond and Ortho-Care.

Orthodontics has some of the very best supply companies and I have been overwhelmed by their encouragement and willingness to help. These include Ortho-Care, DB Orthodontics, TOC, Hawley Russell, TP Orthodontics, 3M Unitek, Precision Orthodontics, Optident, Torque Orthodontics, Dental Directory and Colgate. I am grateful for their permission to use their products in the photographs.

I have had the pleasure of being associated with ONG from the beginning. You would look a long time to find harder working or more focused folk. It is impossible to mention everyone, but special thanks go to Alex Moss, Ann Jones, Denise Douglass, Debra Worthington, Janet Gray, Carly Matthews, Mary Bardet and Anne Gowans. Extra special thanks are needed for Janet Robins, a lady who leads by example and who freely shares her font of knowledge. To the many others not mentioned by name, you are not left out, you know who you are, a big thank you to you too.

My respect for the British Orthodontic Society is infinite. They have long been in the forefront in fostering the ‘team’ approach in orthodontics in the UK. It has been, and continues to be, hugely supportive of orthodontic nurses and they have blazed a trail for other specialties to follow. Special thanks to Ann Wright and her team, Tony, Ann, Jaki and Gavin and everyone at Bridewell Place. You set the standard.

A big thank you to my colleagues, the delightful team of folks with whom I have the pleasure of working, especially Alan Hall, Jo Clark, Angus Pringle, David Keats, Helen Signy, Judith Edwards, Peggy Taylor, Wendy Winstanley, Trudy Johns, Julia Glennon, Suzanne Ryder-Lee and Ian Bond. You make work days fun and enrich my day-to-day enjoyment of orthodontics.

Many moons ago, I received a note from Caroline Holland, asking if I would consider writing a small article about Orthodontic Nursing. While I was quite sure that I could not, it was Caroline who convinced me that I could. I owe her a huge debt of gratitude, but for her, I would not even have written the title!

Last, but by no means least, my thanks to Baljinder Kaur at Aptara and to the fantastic support team at Wiley-Blackwell, with special thanks to Katrina Hulme-Cross, Nick Morgan and Emily Jefferson, who were always there to advise and encourage, and regularly and generously went the extra mile.

Chapter 1

Definition of orthodontics and factors influencing orthodontic treatment

Orthodontics is a specialised branch of dentistry. The name comes from two Greek words:

- *orthos* – meaning straight or proper
- *odons* – meaning teeth

so the meaning is clear – ‘straight teeth’.

Orthodontics is the study of the variations of the development and growth of the structures of the face, jaws and teeth, and of how they affect the occlusion (bite) of the teeth.

Ideally, there should be the same number of permanent teeth in each arch. Any deviation from the norm is called:

- a malocclusion, if it affects teeth alignment and the bite relationship

Most malocclusions are genetically caused, i.e. they are inherited, e.g. missing teeth or a protruding mandible.

Other malocclusions can be caused by the patient, e.g. digit sucking or trauma.

Orthodontic treatment can correct a malocclusion by putting the teeth into their normal position and occlusal relationship (with surgical help, if needed) so that:

- the bite is fully functioning and the patient can bite and chew properly
- the oral hygiene is made easier, thus helping to prevent caries and gingivitis
- the malocclusion does not cause other damage
- the patient looks better and has better self-esteem

Orthodontic treatment in conjunction with orthognathic (maxillo-facial) surgery can correct an underlying jaw discrepancy or facial asymmetry.

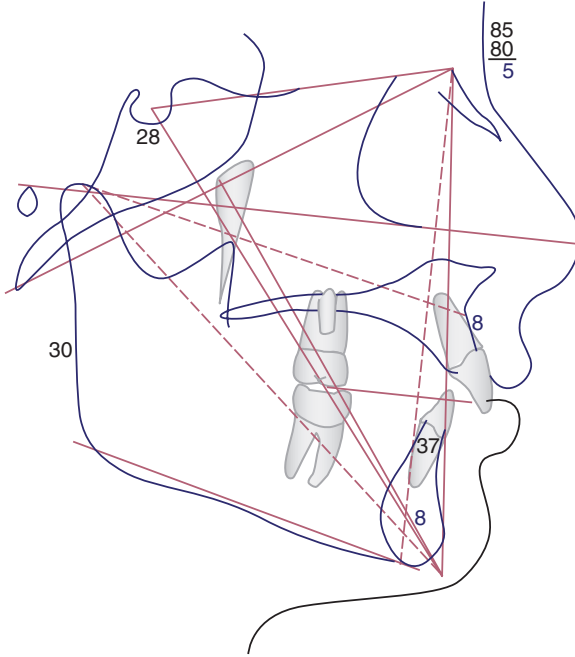


Figure 1.1 Cephalometric tracing.

Orthodontic planning is done in conjunction with the surgeons using clinical and radiographic assessment, with a cephalometric tracing (Figure 1.1) often analysed using computer software program.

So, orthodontists set out to:

- straighten teeth
- improve the bite
- improve the function
- improve oral hygiene (and make teeth easier to clean)
- improve self-esteem of the patient

CLASSIFICATION OF OCCLUSION

When assessing occlusion there are two aspects to classification:

- incisor relationship
- buccal segment occlusion, left and right

Both are recorded on a patient's Orthodontic Assessment Form.

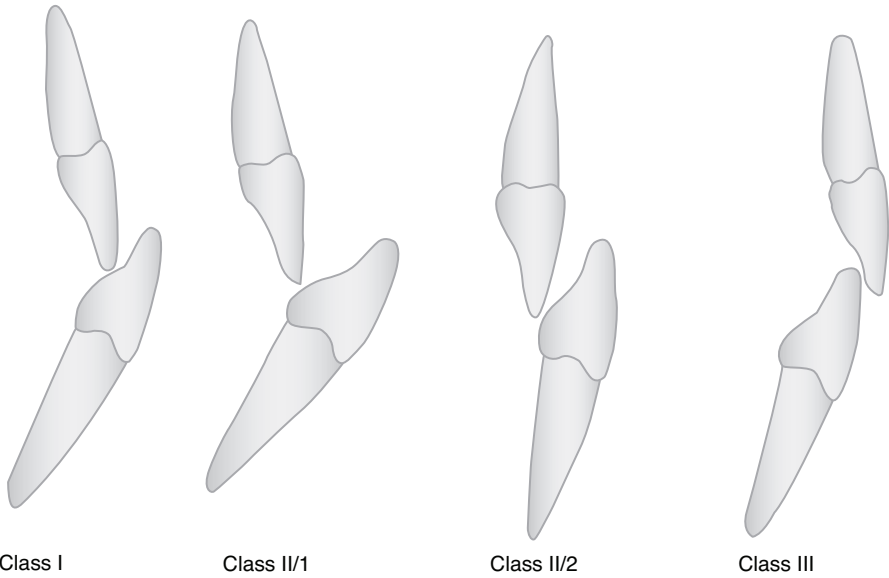


Figure 1.2 Incisor classification.

Incisor classification

- Classes have roman numerals, e.g. I, II, III
- Divisions do not, e.g. Class II/1 or Class II/2

The incisor classification (Figure 1.2):

- relates to the bite of the tip of the lower central incisors onto the back of the upper central incisors
- is divided into three horizontal sections and where the lower incisor occludes will determine the classification

Class I

- The incisal edge of the lower incisors bites on or below the cingulum plateau of the upper incisors

Class II/1

- The upper incisors are proclined or upright (Figures 1.3 and 1.4)
- The lower incisors bite behind the cingulum plateau of the upper incisors
- The position of these front teeth means they can be damaged more easily because of their vulnerable position



Figure 1.3 Large overjet.



Figure 1.4 Side view of severe overjet.



Figure 1.5 Bite stripping lower gingivae.

Class II/2

- The upper incisors are retroclined
- The lower incisors bite behind the cingulum plateau
- The position of the teeth can, when closed, lead to trauma to the lower labial gingivae and the upper palatal gingivae (Figures 1.5–1.7)

Figure 1.6 Damage to labial gingivae caused by bite.



Figure 1.7 Bite causing trauma to the palate.



Figure 1.8 Class III.



Class III

- The bite is edge to edge or reversed
- The incisal edge of the upper incisors can bite into the back (lingual) surface of the lower incisor (Figure 1.8)
- A horizontal overlap is called **overjet**
- A vertical overlap is called **overbite**

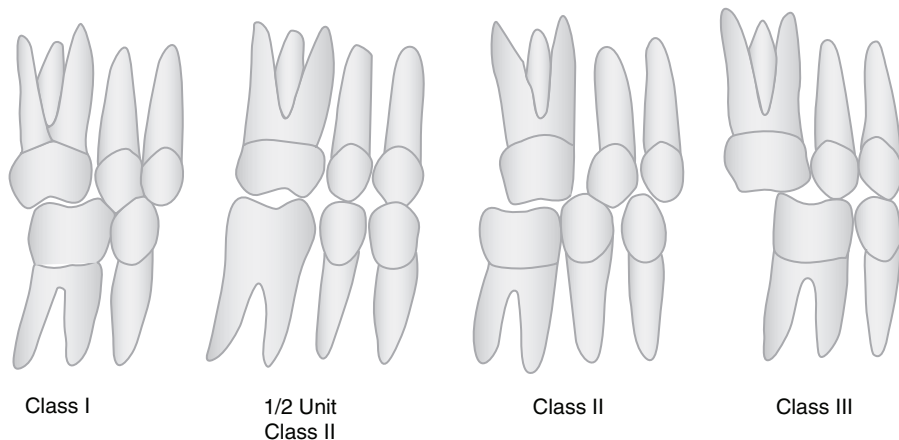


Figure 1.9 Diagram of buccal segment occlusion.

Buccal segment occlusion

The buccal segment occlusion (Figure 1.9):

- was devised by Edward Angle in 1890
- is still widely used today
- is based on the occlusion between the first permanent molar teeth, which erupt when the patient is about 6 years old

There are three classes:

- **Class I** – This is as near to the correct relationship as you see
- **Class II** – This is at least half a cusp width behind the ideal relationship
- **Class III** – This is at least half a cusp width in front of the ideal relationship

THE MIXED DENTITION

Sometimes parents see their child's perfectly straight deciduous (baby) teeth fall out only to be replaced by a 'jumble' of crowded permanent teeth (Figure 1.10).

A combination of full-sized teeth in a face that still has a lot of growing to do often prompts parents to request an early orthodontic opinion. Permanent teeth can look huge in little faces.

The average times for permanent tooth eruption are:

- Age 6
 - 1/1 lower central incisors
 - 6/6 lower first molars
 - 6/6 upper first molars



Figure 1.10 Mixed dentition.

- Age 7
 - 1/1 upper central incisors
 - 2/2 lower lateral incisors
- Age 8
 - 2/2 upper lateral incisors
- Age 11
 - 3/3 lower canines (cuspids)
 - 4/4 lower first premolars (bicuspid)
 - 4/4 upper first premolars (bicuspid)
- Age 12
 - 3/3 upper canines (cuspids)
 - 5/5 lower second premolars (bicuspid)
 - 5/5 upper second premolars (bicuspid)
 - 7/7 upper second molars
 - 7/7 lower second molars
- Age 18–25
 - 8/8 upper third molars (wisdom teeth)
 - 8/8 lower third molars (wisdom teeth)

Normally, patients begin orthodontic treatment between 10 and 13 years of age. At 10–11 years, they are still in the mixed dentition with:

- some deciduous teeth
- some permanent teeth
- some teeth yet to erupt

INDICATIONS FOR TREATMENT

Clinical indications for orthodontic treatment may be because the teeth:

- are overcrowded
- may have erupted out of position



Figure 1.11 Lower incisor trapped outside the bite.

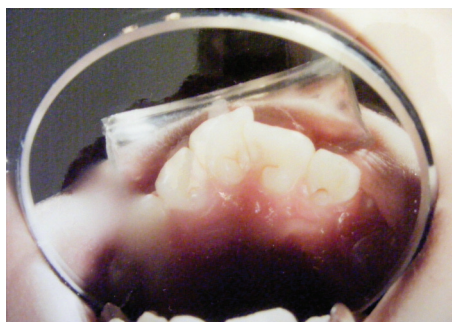


Figure 1.12 Caries between overlapping teeth.

- are protruding – Class II/1
- are in a reverse bite
- are in a self-damaging bite (Figure 1.11)
- are spaced
- are absent – hypodontia
- are damaged

Where there is a mild malocclusion, i.e.:

- with only very small irregularities
- where the tooth position does not compromise oral hygiene
- which does not interfere with function, e.g. biting off food, eating

orthodontic treatment may not be indicated, as it may not be seen to significantly improve dental health.

Those cases, e.g.:

- with overcrowded, protruding teeth
- with rotated teeth which make oral hygiene difficult and cause problems with caries (Figure 1.12)
- which visually deviate from average, e.g. a reverse bite
- which look unattractive and affect the smile
- which seriously affect function, e.g. makes chewing food difficult

are classed as malocclusions warranting treatment.

UNDERLYING CAUSES OF MALOCCLUSION OF THE TEETH

There may also be:

- underlying skeletal abnormalities
- facial asymmetries

These can be:

- hereditary (run in families, e.g. tendency to be Class III)
- a result of injury
- a result of illness affecting facial or skeletal growth
- a result of a syndrome or cleft

These may require orthodontic treatment as part of a multi-disciplinary care treatment pathway.

MULTI-DISCIPLINARY APPROACH

Some patients require orthodontic treatment in conjunction with other dental specialties.

These include:

- restorative (e.g. hypodontia patients needing implants/bridges or microdontia patients needing veneers or crowns)
- surgical (e.g. patients needing an osteotomy)
- cleft (e.g. patients needing alveolar bone grafting)

These patients have their orthodontic treatment in coordination with the other specialties.

Problems when the arch is not intact

One of the aims of orthodontic treatment is to have each tooth in its correct place within the dental arch.

If a tooth is malaligned (out of its correct position), it is not necessarily an isolated problem; it has a domino effect.

The teeth on either side of it may also be out of their correct position and the opposing tooth does not have the correct occlusion (bite).

If there is no tooth to oppose it, a tooth may supra-erupt. Contact points are lost, teeth rotate and, because they are no longer self-cleansing, food traps are created, where fibres can get lodged or packed.

As a consequence of this, plaque is encouraged to accumulate:

- which inflames the gingivae (gums)
- which encourages periodontal pockets

In the young patient this is not too drastic, as it probably has not yet become a significant issue.

In adult patients, however, following orthodontic treatment, it may be necessary to restore incisal edges or fill cervical abrasion cavities, which only become apparent when the teeth have been corrected.

BRUXISM

- Young patients, towards the end of the deciduous dentition, can often present with teeth almost ground down to gingival level. It may continue into the mixed dentition and is often quite noisy and noticeable when it occurs in sleep
- For some older patients with severe bruxism, an occlusal guard can be made to be worn overnight during sleep. This attempts to limit the damage that is done to the incisal and occlusal surfaces of the teeth
- Anxious patients also grind and clench their teeth during the day when under stress

DIGIT SUCKING

Some patients continue to suck their fingers or thumbs well beyond the age when their deciduous teeth have been replaced by their permanent successors. A prolonged habit is one which exists beyond the age of 7 years.

It may adversely affect the bite and position of the anterior teeth and can produce a unilateral buccal crossbite, an asymmetrical anterior open bite (where the digit enters the mouth) (Figure 1.13) or an increased overjet. How much damage is caused depends on for how long the thumb or finger is sucked and how strong the habit is.

These patients may try really hard to break this habit.



Figure 1.13 Anterior open bite due to digit sucking.

It is possible to fit a removable upper anti-habit appliance, which is worn full-time or sometimes when they are asleep.

It is an upper removable appliance that has prongs in the centre of the palate, which act as a positive deterrent for the thumb or finger. This usually breaks the habit.

DENTAL HEALTH

Some problems are caused by:

- diet – too much sugary or acidic food or drink (dental caries)
- tooth brushing – the wrong technique, too hard a brush
- acid reflux – symptom of bulimia
- medication – side effect of some medication inhalers

Damage to teeth resulting in tooth surface loss comes under the general headings of:

- Attrition – bruxists (patients that grind their teeth, often during sleep)
- Abrasion – excessive wear, e.g. overenthusiastic tooth brushing
- Erosion – acid attack on the enamel, found in fresh fruit juice, diet drinks and stomach acids (reflux in eating disorders)
- Abfraction – a tooth being ‘high on the bite’ and being overloaded

CONDITION OF THE SURROUNDING SOFT TISSUES

Lips

Lips can be:

- competent – when they are at rest they come together easily and form a good oral seal
- incompetent – when at rest they do not close, or if they are closed, the lips are strained, often as a result of posturing. This closure is only temporary

Tongue

- The tongue works with the lower lip to form a seal when swallowing
- A tongue which tends to thrust can push forward and ‘splay’ the front teeth out

The position of the teeth and the form of the dental arches are determined by the balance of the soft tissues between tongue and lips/cheeks.