

ALISON CHAPMAN  
AND SIMON H. FELTON

*Basic Guide to*  
**ORAL HEALTH  
EDUCATION AND  
PROMOTION**

THIRD EDITION



with website



WILEY Blackwell



# **Basic Guide to Oral Health Education and Promotion**



# BASIC GUIDE TO ORAL HEALTH EDUCATION AND PROMOTION

Third Edition

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**WILEY** Blackwell

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# Dedication

*Love your patients and they will do anything that you ask.*

Ann Felton (1942–2007)

Ann Felton made patients smile and their smiles brighter. Ann was a dental hygienist, tutor, mentor, and writer; a wife to David, and a mother to Sarah and Simon. She also ran her own oral health education course for dental nurses who she referred to as ‘the darlings of dentistry’.

Ann wrote the first edition of this book in difficult circumstances, yet retained her love of the subject and her wonderful sense of humour throughout. This third edition is dedicated to Ann’s life and work.







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# Foreword

This third edition of the *Basic Guide to Oral Health Education and Promotion* will be welcomed by dental care professionals (DCPs).

The first edition (2008) was a collaboration between two very experienced oral health educators and dental hygienists, Ann Felton and Alison Chapman, and editor Simon Felton who (together with practice manager Elizabeth Hill), ran a very successful oral health education course for over 10 years. A revised second edition was updated by Alison and Simon (both now e-learning course consultants), and published in 2014. It was dedicated to the life and work of Ann who sadly died in 2007 following a brave struggle with breast cancer.

There are very few books published in the UK that have been created by DCPs for DCPs, and this book is a perfect model, having been written with the experience and insight that comes from a lifetime of tutoring on the subject and working closely with other professionals and patients. This has given the authors a comprehensive understanding of the needs of students and practitioners in delivering oral health education and promotion.

Healthcare professionals have long been aware of the need to regularly update their knowledge and skills in this era of fundamental change and development. Accordingly, the authors have comprehensively reviewed and updated this edition, encompassing the many changes that have been brought about in dentistry, through advances in scientific research, technology, products, and policy.

The book takes the reader on a carefully thought-out journey, beginning with the underpinning knowledge that is vital to students and newcomers to oral health education, and is a welcome revision aid for all the dental team. Each chapter has been reviewed and updated. For example, Chapter 4 includes the BSP 2017 Classification of Periodontal Diseases, and Chapter 6 the Basic Erosive Wear Examination (BEWE). Clear and concise information is provided throughout the book, with relevant learning outcomes listed at the beginning of each chapter.

All health professionals involved in oral health education and promotion are aware that having access to evidence-based information is essential, however in addition to knowledge of the subject, oral health educators must be able to motivate and inspire. This leads to the question, ‘*Who or what, motivates the motivators?*’

The ability to enthuse and inspire is one of the skills that an oral health educator should have. One cannot fail to recognise the enthusiasm that the authors have for the subject as it is deeply embedded in the script, and that makes this an essential text for those who are delivering oral health education as well as those who aspire to it. The saying, '*enthusiasm cannot be taught as it has to be caught*,' is very relevant to oral health education and promotion, and readers will not only gain the knowledge they need to be effective educators, but also the inspiration and enthusiasm to deliver it.

*Rosemarie Khan OBE*  
OBE, M.Ed., BA, Dip. DH, Dip. DHE, FAETC

# Preface

Oral health is central to our general wellbeing. The health of the body begins with the oral cavity, since all our daily nutrients, beneficial or otherwise, pass through it.

Knowledge in the field of oral health changes rapidly, with developments in scientific research, products and technology, and policy. Patients therefore need trained oral health educators (OHEs) and promoters who have the latest knowledge in the field to help prevent and control dental conditions and diseases. It is also vital that dental care professionals (DCPs) and health professionals consistently promote the same messages to avoid confusion, and ultimately improve and maintain oral health within the population.

This book covers the theoretical and practical aspects of oral health education and promotion and is the course companion for UK dental nurses studying oral health education. It is also aimed at dental hygienists, therapists, and dentists who regularly promote and practise oral health education and require up-to-date, evidence-based knowledge. Other professionals, such as health visitors, nurses, dieticians, midwives, and teachers will also find the book invaluable.

Each chapter deals with various aspects of oral health in logical order, and includes *learning outcomes*, detailing what the reader (particularly students) should have learned by the end of each chapter.

After reading this book, the reader should be able to:

- Confidently educate patients about diseases and conditions that affect the oral cavity; their prevention, treatment, and management.
- Plan and undertake a lesson on an oral health topic to an individual and a group.
- Provide a very brief intervention on smoking and alcohol, and signpost patients towards specialist support.
- Give basic advice on diet, nutrition, and exercise.
- Set up a preventive dental unit and an exhibition on an oral health topic.
- Be aware of the wider context of oral and health education and promotion in society.
- Use knowledge gained to help pass a qualification in oral health education.



# Acknowledgements

The authors wish to thank Elizabeth Hill, RDN, Cert. OHE (NEBDN) for her expert advice and contributions throughout the book;

Rosemarie Khan, OBE, M.Ed., BA, Dip. DH, Dip. DHE, FAETC (Dental Hygiene Tutor, School for Dental Care Professionals, University Dental Hospital of Manchester) for writing the foreword.

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Dr Rachel Sammons (Institute of Clinical Sciences, College of Medical & Dental Sciences, The University of Birmingham);

Elaine Tilling MSc, RDH, DMMS, MIPHE, (TePe Oral Hygiene Products Ltd.);

Professor Nicola West (Professor in Restorative Dentistry, Bristol University).





# About the Companion Website

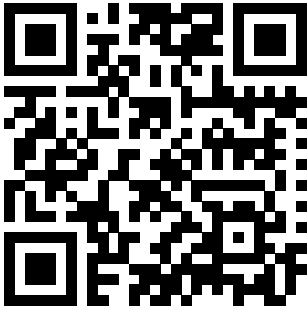
Don't forget to visit the companion website for this book:

[www.wiley.com/go/felton/oralhealth](http://www.wiley.com/go/felton/oralhealth)



There you will find valuable material designed to enhance your learning, including multiple choice questions.

Scan this QR code to visit the companion website





## Section 1

# Structure and Functions of the Oral Cavity

### INTRODUCTION

Part 1 of this book contains one chapter, which looks at the structure and functions of the oral cavity in some detail.

It explores the development of the oral cavity *in utero*, including cleft lip and palate, the structure of the tooth and its supporting tissues, plus eruption dates for primary and secondary dentitions.

It also includes the functions of the tongue in maintaining oral health and common conditions associated with it, plus the composition and role of saliva in keeping the mouth healthy.



# Chapter 1

## The oral cavity in health

### Learning outcomes

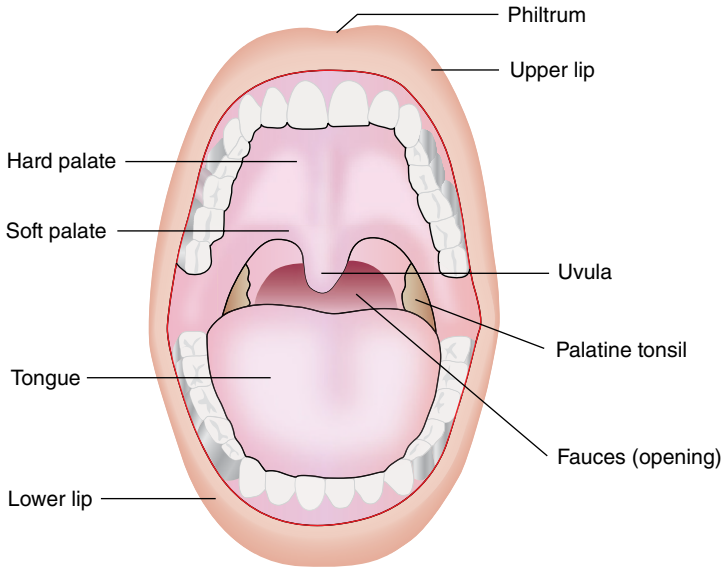
By the end of this chapter you should be able to:

1. Describe how the oral cavity, jaws, and face develop *in utero*.
2. Explain the structures and functions of the tissues and fluid of the oral cavity, including teeth, supporting structures, the tongue, and saliva.
3. Distinguish between the different types of cleft lip and cleft palate.
4. List primary and secondary dentition eruption dates.

### INTRODUCTION

Before oral health educators (OHEs) can deliver dental health messages to patients and confidently discuss oral care and disease with them, they will need a basic understanding of how the mouth develops *in utero* (in the uterus), the anatomy of the oral cavity (Figures 1.1, 1.2, 1.3, and 1.4), and how the following structures function within it:

- Teeth (including dentition).
- Periodontium (the supporting structure of the tooth).
- Tongue.
- Salivary glands (and saliva).



**Figure 1.1** Structure of the oral cavity. Source: From [1]. Reproduced with permission of Elsevier.



**Figure 1.2** A healthy mouth (white person). Source: [2]. Reproduced with permission of Blackwell.



**Figure 1.3** A healthy mouth (black person). Source: Alison Chapman.



**Figure 1.4** A healthy mouth (Asian person). Source: Alison Chapman.

## ORAL EMBRYOLOGY

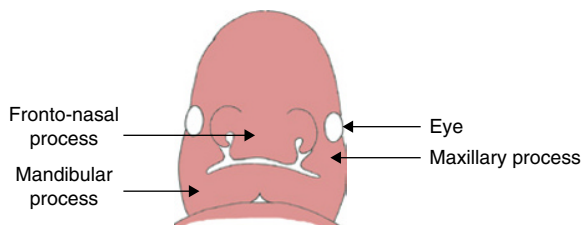
A basic understanding of the development of the face, oral cavity, and jaws in the embryo and developing foetus will help enable the OHE to discuss with patients certain oral manifestations of conditions that stem from *in utero* development; notably cleft lip and palate.

An *embryo* describes the growing organism up to 8 weeks *in utero*; a *foetus* describes the growing organism from 8 weeks *in utero*.

### Development of the face

At approximately week 4 *in utero* (Figure 1.5), the embryo begins to develop five facial processes (or projections), which eventually form the face, oral cavity, palate, and jaws by week 8 [3]:

- Fronto-nasal process – forms the forehead, nose, and philtrum (groove in upper lip).
- Maxillary process (two projections) – forms the middle face and upper lip.
- Mandibular process (two projections) – forms the mandible (lower jaw) and lower lip.



**Figure 1.5** Facial development at 4 weeks *in utero*. Source: From [3]. Reproduced with permission of Wiley-Blackwell.

## Development of the palate and nasal cavities

### Week 5

The frontonasal and maxillary processes begin to form the nose and maxilla (upper jaw). However, if the nasal and maxillary processes fail to fuse, then a cleft will result. This is the most common craniofacial (skull and face) abnormality that babies are born with, and is thought to commonly result from a combination of genetic and environmental factors, or as part of a wider syndrome [4].

A baby can be born with a cleft lip, a cleft palate, or both. Cleft lip and/or palate occurs in 1–2 births out of every 1000 in developed countries [5]. Submucous cleft palate can also occur, which is a cleft in the soft palate and includes a split in the uvula. Surgery to close a gap is often undertaken when a baby is less than a year old.

A cleft lip can be anything from a small notch in the lip (incomplete cleft lip) to a wide gap that runs up to the nostril (complete cleft lip). It can also affect the gum, which, again, can be a small notch or complete separation of the gum.

A cleft lip can be either (Figure 1.6):

- Unilateral – affects one side of the mouth (incomplete or complete).
- Bilateral – affects both sides of the mouth (incomplete or complete).

A cleft palate is a gap in the roof of the mouth. A cleft can affect the soft palate (towards the throat) or the hard palate (towards the lips), or both. Like a cleft lip, a cleft palate can be unilateral or bilateral, and complete or incomplete (Figure 1.6)

### Week 6

By week 6, the primary palate and nasal septum have developed. The septum divides the nasal cavity into two.

### Week 8

By week 8, the palate is divided into oral and nasal cavities.

## Development of the jaws (mandible and maxilla)

### Week 6

By week 6, a band of dense fibrous tissue (Meckel's cartilage) forms and provides the structure around which the mandible forms.

### Week 7

By week 7, bone develops, outlining the body of the mandible.

As the bone grows backwards two secondary cartilages develop; these eventually become the condyle and coronoid processes.

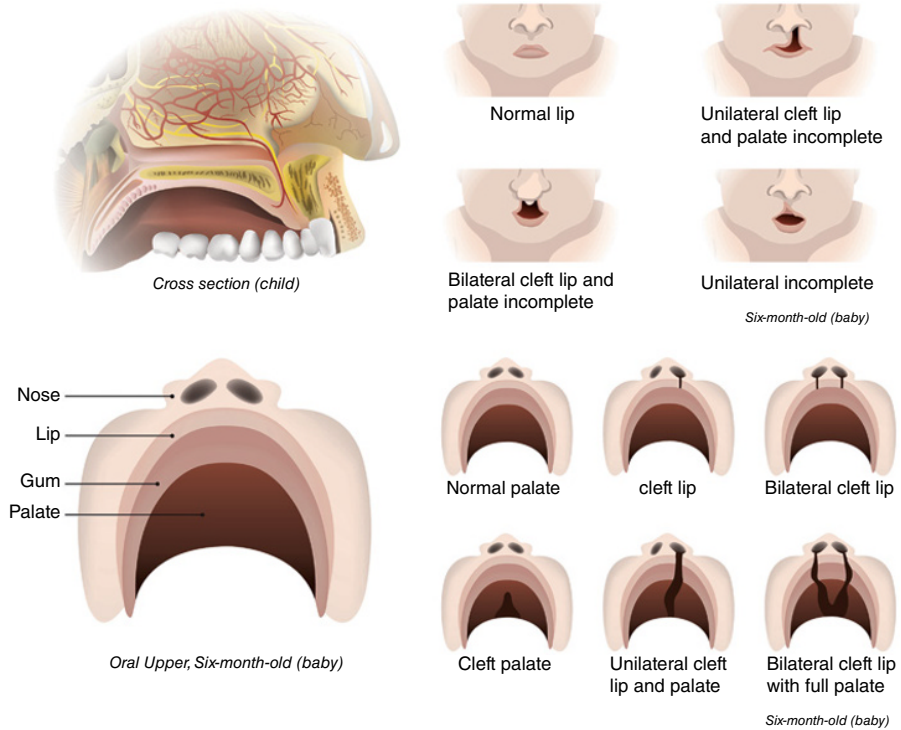
As the bone grows forward, the two sides are separated by a cartilage called the mandibular symphysis. The two sides will finally fuse into one bone approximately 2 years after birth.



## Pediatric

### Cleft Lip and Palate

Cleft lip and cleft palate, also known as orofacial cleft, is a group of conditions that includes cleft lip (CL), cleft palate (CP). A cleft lip contains an opening in the upper lip that may extend into the nose.



**Figure 1.6** Cleft lip and palate in a six-month-old baby. Source: Dreamstime.com/Pattarawit Chompipat | ID 84347343. Reproduced with permission of Dreamstime.com.

Upward growth of bone begins along the mandibular arch forming the alveolar process, which will go on to surround the developing tooth germs.

### Week 8

By week 8, ossification (bone development) of the maxilla begins.

### Tooth germ development in the foetus

Tooth germ (tissue mass) develops in three stages known as bud, cap, and bell. The developing tooth germ can be affected by the mother's health (see Chapter 20).

1. Bud – at 8 weeks, clumps of cells form swellings called enamel organs. Each enamel organ is responsible for the development of a tooth.

2. Cap – the enamel organ continues to grow and by 12 weeks (the late cap stage), cells have formed the inner enamel epithelium and the outer enamel epithelium. Beneath the inner enamel epithelium, the concentration of cells will eventually become the pulp. The enamel organ is surrounded by a fibrous capsule (the dental follicle), which will eventually form the periodontal ligament.
3. Bell – by 14 weeks, the enamel organ will comprise different layers, which will continue to develop to form the various parts of the tooth.

## MAIN FUNCTIONS OF THE ORAL CAVITY

The oral cavity is uniquely designed to carry out two main functions:

1. Begin the process of digestion. The cavity's hard and soft tissues, lubricated by saliva, are designed to withstand the stresses of:
  - Biting.
  - Chewing.
  - Swallowing.
2. Produce speech.

## TEETH

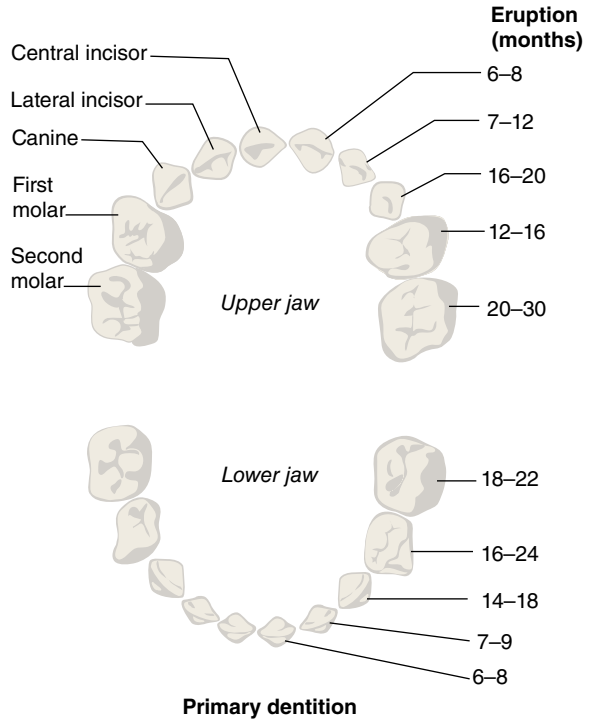
Different types of teeth are designed (shaped) to carry out different functions. For example, canines are sharp and pointed for gripping and tearing food, while molars have flatter surfaces for chewing. Tooth form in relation to function is called morphology.

Dental nurses and healthcare workers may remember from their elementary studies that there are two types of dentition (a term used to describe the type, number and arrangement of natural teeth):

1. Primary (deciduous) dentition – consisting of 20 baby teeth.
2. Secondary (permanent) dentition – consisting of 32 adult teeth.

### Primary dentition

There are three types of deciduous teeth that make up the primary dentition (Figure 1.7): incisors, canines, and molars (first and second). Table 1.1 details their notation (the code used by the dental profession to identify teeth), approximate eruption dates, and functions.



**Figure 1.7** Primary dentition. Source: From [1]. Reproduced with permission of Elsevier.

**Table 1.1** Primary dentition (notation, approximate eruption dates, and functions).

Tooth	Notation	Approximate eruption date	Function
Incisors	(a & b)	6–12 months (usually lowers first)	Biting
First molars	(d)	12–24 months	Chewing
Canines	(c)	14–20 months	Tearing
Second molars	(e)	18–30 months	Chewing

**Table 1.2** FDI World Dental Federation notation for deciduous (primary) dentition.

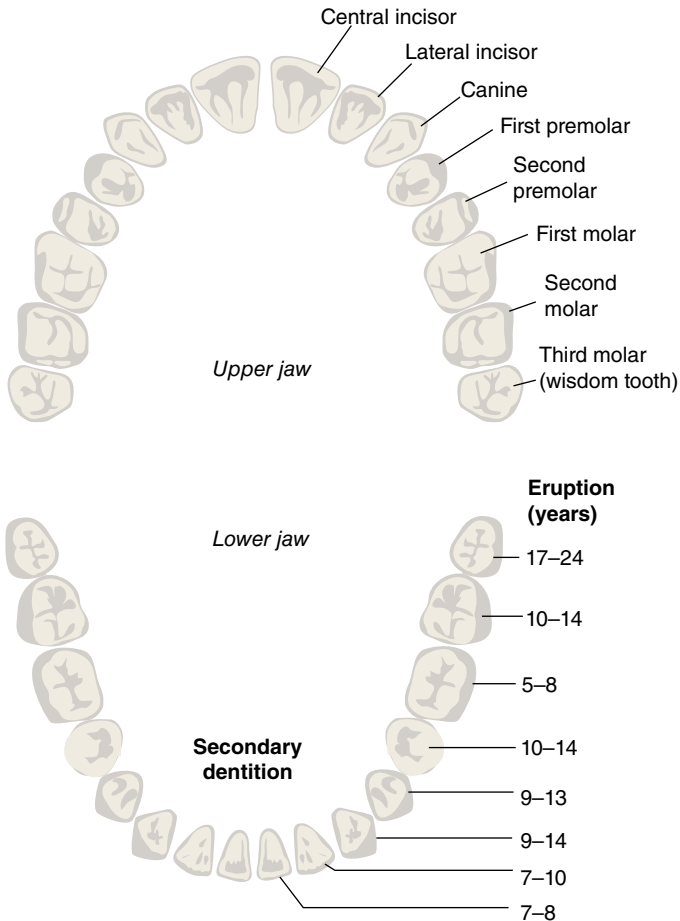
Patient's upper right (5)	Patient's upper left (6)
55 54 53 52 51	61 62 63 64 65
85 84 83 82 81	71 72 73 74 75
Patient's lower right (8)	Patient's lower left (7)

Table 1.2 details the FDI World Dental Federation notation for primary dentition, which is a charting system commonly used by dentists to associate information to a specific tooth; where the quadrant number is the first digit applied, and the second number identifies the individual tooth.

## Secondary dentition

There are four types of permanent teeth that make up the secondary dentition (Figure 1.8): incisors, canines, premolars, and molars. Table 1.3 details their notation, approximate exfoliation/eruption dates, and functions. Table 1.4 details the FDI World Dental Federation notation for secondary dentition.

It is important to remember that these exfoliation/eruption dates are only approximate and vary considerably in children and adolescents. The educator should be prepared to answer questions from parents who are worried that their child's teeth are not erupting at the same age as their friends' teeth. Parents often do not realise, for example, that no teeth fall out to make room for the first permanent molars (sixes), which appear behind the deciduous molars.



**Figure 1.8** Secondary dentition. Source: From [1]. Reproduced with permission of Elsevier.

**Table 1.3** Secondary dentition (notation, approximate exfoliation/eruption dates, and functions).

Tooth	Notation	Approximate exfoliation/ eruption dates	Function
First molars	(6)	6–7 years	Chewing
Lower central incisors	(1)	6–7 years	Biting
Upper central incisors	(1)	6–7 years	Biting
Lower lateral incisors	(2)	7–8 years	Biting
Upper lateral incisors	(2)	7–8 years	Biting
Lower canines	(3)	9–10 years	Tearing
First premolars	(4)	10–11 years	Chewing
Second premolars	(5)	11–12 years	Chewing
Upper canines	(3)	11–12 years	Tearing
Second molars	(7)	12–13 years	Chewing
Third molars	(8)	17–24 years	Chewing

**Table 1.4** FDI World Dental Federation notation for permanent (secondary) dentition.

Patient's upper right (1)	Patient's upper left (2)
18 17 16 15 14 13 12 11	21 22 23 24 25 26 27 28
48 47 46 45 44 43 42 41	31 32 33 34 35 36 37 38
Patient's lower right (4)	Patient's lower left (3)

## Structure of the tooth

Tooth structure (Figure 1.9) is complex and comprises several different hard layers that protect a soft, inner pulp (nerves and blood vessels).

### Organic and inorganic tooth matter

The terms *organic* and *inorganic* are often mentioned in connection with tooth structure. Educators must know what these terms mean and their percentages in hard tooth structures.

Organic means *living* and describes the matrix (framework) of water, cells, fibres and proteins, which make the tooth a living structure.

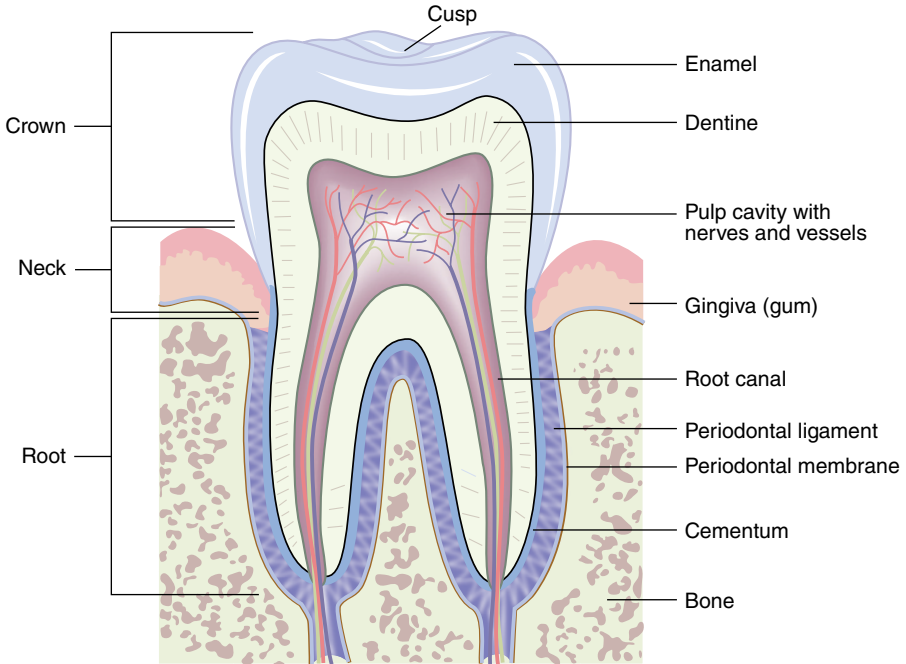
Inorganic means *non-living* and describes the mineral content of the tooth, which gives it its strength. These minerals are complex calcium salts.

Table 1.5 shows the percentages of organic and inorganic matter in hard tooth structures.

It is also important to know the basic details about these three hard tooth substances, and also pulp.

### Enamel

Enamel (Figure 1.9) is made up of prisms (crystals of hydroxyapatite) arranged vertically in a wavy pattern, which give it great strength. The prisms, which



**Figure 1.9** Structure of the tooth. Source: From [1]. Reproduced with permission of Elsevier.

**Table 1.5** Percentages of organic and inorganic matter in hard tooth structures.

Structure	Inorganic	Organic
Enamel	96%	4%
Dentine	70%	30%
Cementum	45%	55%

resemble fish scales, are supported by a matrix of organic material including keratinised (*horn-like*) cells, which can be seen under an electron microscope.

### **Properties of enamel**

Enamel is:

- The hardest substance in the human body.
- Brittle – it fractures when the underlying dentine is weakened by decay (caries).
- Insensitive to stimuli (e.g. hot, cold, and sweet substances).
- Darkens slightly with age – as secondary dentine is laid down and stains from proteins in the diet, tannin-rich food and drinks, and smoking are absorbed.