# 3d imaging and dentistry from multiplane cephalometry to guided navigation in implantology

**#3D dental imaging #dental implantology #guided implant surgery #multiplane cephalometry #dental navigation systems**

Explore the comprehensive role of 3D imaging in modern dentistry, tracing its evolution from foundational diagnostic tools like multiplane cephalometry for precise anatomical assessment to advanced applications in guided navigation for highly accurate implantology. This encompasses the full digital workflow, significantly enhancing precision, predictability, and patient outcomes across various dental procedures.



## Digital Dental Implantology

This book describes the fusion of CBCT and CAD/CAM technologies for the purpose of surgical dental treatments and explains the advantages and applications of this digital approach for implant placement procedures and other oral surgical protocols. All aspects of computer-aided imaging and design are first covered in the textbook, including the creation of DICOM and STL files; followed by the process of virtual merging to obtain a combined image. Secondly, clinical tips for the use of digital wax up, software interactions and accurate template fabrication are explained, including subtractive and additive methods used for this manufacturing step. The remainder of the book is devoted to the application of technology fusion in implantology, guided bone regeneration, and maxillofacial surgery. Both static and dynamic guided surgeries are described. Materials characteristics and surgical instruments are also presented to define a correct selection criteria. The digital approach outlined in this textbook involves a paradigm shift in the way traditional oral surgery is conceived. Technology fusion aims to improve treatment accuracy, optimize clinical time and reduce patient morbidity. Clinicians will find this book to be a valuable guide for virtual surgical planning and a path to introduce themselves into the exciting world of digital dental surgery.

## GUIDED SURGERY

This is not the ordinary academic text to have in your library. It's the result of the commitment of the Author, a practicing clinician who has focused his career on practical solutions to treat thousands of cases. It is an easy to consult handbook, and Dentists and readers who just get started with guided surgery will be able to find the sections and domains of interest very quickly. It's a punctual manual intended to offer practical applications and real-world solutions to the clinical cases to deal with. Clinicians will find this book to be a valuable guide for virtual surgical planning and a path to introduce themselves into the exciting world of digital dental surgery.

## Craniofacial 3D Imaging

This book is designed to serve as an up-to-date reference on the use of cone-beam computed tomography for the purpose of 3D imaging of the craniofacial complex. The focus is in particular on the ways in which craniofacial 3D imaging changes how we think about conventional diagnosis and treatment planning and on its clinical applications within orthodontics and oral and maxillofacial surgery. Emphasis is placed on the value of 3D imaging in visualizing the limits of the alveolar bone, the airways, and the temporomandibular joints and the consequences for treatment planning and execution. The book will equip readers with the knowledge required in order to apply and interpret 3D imaging to the benefit of patients. All of the authors have been carefully selected on the basis of their expertise in the field. In describing current thinking on the merits of 3D craniofacial imaging, they draw both on the available scientific literature and on their own translational research findings.

## 3D Diagnosis and Treatment Planning in Orthodontics

This richly illustrated book is a wide-ranging guide to modern diagnostics and treatment planning in orthodontics, which are mandatory prior to the initiation of any type of comprehensive treatment. The importance of three-dimensional (3D) imaging techniques has been increasingly recognized owing to the shortcomings of conventional two-dimensional imaging in some patients, such as those requiring complex adult treatment and those with temporomandibular joint dysfunctions or sleep disturbances. In the first part of this book, readers will find clear description and illustration of the diagnostic role of the latest 3D imaging techniques, including cone beam computed tomography, intra-oral scanning, and magnetic resonance imaging. The second part explains in detail the application of 3D techniques in treatment planning for orthodontic and orthognathic surgery. Guidance is also provided on the use of image fusion software for the purposes of accurate diagnosis and precise design of the most appropriate biomechanical approach in patients with malocclusions.

## Cone Beam Computed Tomography

Cone Beam Computed Tomography is an imaging technique in which x-rays diverge to form a cone. Cone Beam Computed Tomography: A Clinician’s Guide to 3D Imaging is a concise, highly illustrated manual on this increasingly important form of imaging in dentistry. Cone Beam Computed Tomography: A Clinician’s Guide to 3D Imaging includes 180 full colour images and illustrations, further enhancing this invaluable resource for dentists.

## Digital Technologies in Oral and Maxillofacial Surgery, An Issue of Atlas of the Oral and Maxillofacial Surgery Clinics

Cutting edge information for all oral and maxillofacial surgeons on computed tomography and guided surgery! Topics include comparison of CT and cone beam technologies, stereolithographic modeling and surgical guide concepts, virtual technologies in dentoalveolar evaluation and surgery, computer guided planning and placement of dental implants, utilization in the treatment of facial trauma, digital technologies in pathology and reconstruction, 3D technologies in craniofacial and orthognathic surgery, evaluation and fabrication of custom cosmetic facial implants, and extraoral craniofacial applications.

## Computer-Guided Dental Implants and Reconstructive Surgery - E-Book

Written by recognized dental implant surgery experts Marco Rinaldi, Scott Ganz, and Angelo Mottola, Computer-Guided Applications for Dental Implants, Bone Grafting, and Reconstructive Surgery is the first text to provide state-of-the-art information on procedures and techniques used in guided dental implant surgery and bone grafting. It begins with the basic principles of guided dental implants including anatomical obstacles, pathologies, and pharmacological management of patients, and then uses a templated, atlas format to discuss clinical case studies. With a companion website includes videos demonstrating surgical procedures, this text makes it easier for the entire surgical team to share in the diagnosis and treatment planning for patients receiving implants. Coverage of computer-guided surgery from treatment planning to recovery includes a combination of actual 3-D computed imagery and clinical photos to clearly demonstrate implant surgeries. Bone grafting protocols address 3-D evaluation of bone density and the use of bone grafts to augment bone volume prior to dental implant surgery. 40 case studies include pre- and post-operative considerations as well as the description of the surgical procedure, using high-quality clinical photos as well as CT and 3-D images to clearly illustrate every guided-implant challenge. Over 1,800 full-color images include pre-, intra-, and post-operative photographs, showing pathologies, procedures, and outcomes. Expert, authoritative authors provide guidance based upon extensive experience with current techniques as well as the latest technological

advances in guided-implant surgery. A companion website includes 10 video clips that are linked to selected clinical cases in the text. Digital book formats supplement the print book, making this reference easy to access on iPads, tablets, e-readers, and smart phones.

## Dental Implants, Part II: Computer Technology, An Issue of Oral and Maxillofacial Surgery Clinics of North America

This two-part issue of Oral and Maxillofacial Surgery Clinics of North America is devoted to Dental Implants. Part II focuses on Computer Technology and is edited by Dr. Ole Jensen. Articles will include: Navigation in Zygomatic Implant Placement; Fibula grafting and simultaneous implants: Jaw in a day?; Mixed reality in implant restorative dentistry; Computer guided implant treatment for complete arch restoration; Nitinol (Smileloc) complete arch guided implant treatment; Nitinol (Smileloc) guided single implant treatment; Navigation for dental implant treatment; Bone reconstruction planning using computer technology; Printed titanium bone grafting shells for alveolar reconstruction; Printed resorbable bone grafting shells for alveolar reconstruction; Printed custom root-replicate dental implants; Surgical simulation all-on-4 implant treatment maxilla; Surgical simulation all-on-4 treatment mandible; Robotics in implant dentistry; and more!

## Dental CT Third Eye in Dental Implants

The field of implant dentistry continues to grow both in terms of the number of practitioners placing and restoring implants and in terms of as well as patient demand for successful outcomes in as short a time as possible. The pace of technological changes and new offerings from implant manufacturers and allied industries are equally fast in their attempts to meet these demands, with a frequently bewildering array of potential solutions available to clinicians. This is never more so than in the field of digital dentistry, with hardware and software solutions for diagnosis, imaging, planning, surgery, impression-taking, and the computer-aided design and manufacture of intraoral prostheses. However, we must always remember our responsibility to ensure that our treatments are carried out safely and in the best interests of our patients. This new Volume 11 of the ITI Treatment Guide series continues the successful theme of the previous ten volumes: a compendium of evidence-based methodology in digital techniques and procedures for daily practice. Written by renowned clinicians and supported by contributions from expert practitioners, the ITI Treatment Guide Digital Workflows in Implant Dentistry provides a comprehensive overview of various technological options and their safe clinical application.

## Digital Workflows in Implant Dentistry

Three Dimensional Imaging for Orthodontics and Maxillofacial Surgery is a major new specialist resource that identifies and applies the principles of three dimensional imaging to orthodontic practice. Readers are introduced to three-dimensional imaging, comparing it with the traditional two-dimensional assessments and exploring the benefits and drawbacks of these imaging modalities. Three Dimensional Imaging for Orthodontics and Maxillofacial Surgery centers on the appropriate application of three-dimensional imaging in the various practices related to orthodontic delivery and craniofacial surgery. The book guides the reader through detailed and illustrated examples of three-dimensional patient management in the context of daily practice. Both three-dimensional static and motion analyses are explored. The book also addresses growth, orthodontic treatment and surgical prediction, both static and dynamic and explores the use of morphing and finite element analyses with particular focus on surgical intervention. A key resource for specialist working in the fields of orthodontics and cranio-maxillofacial surgery. KEY FEATURES · Applies principles of 3D imaging to orthodontic practice · Surveys and analyzes current technologies and modalities, relating them to clinical usage · Companion website with motion images ( www.wiley.com/go/kau) · Richly illustrated in full color throughout · Brings together expert contributors for an international perspective

## Three-Dimensional Imaging for Orthodontics and Maxillofacial Surgery

Cone beam computed tomography (CBCT) has become the standard of reference in dental imaging. The distribution of CBCT devices is increasingly wide, and the number of required examinations is constantly growing. In this setting, it is now essential that medical and technical staff receive specific training in the use of CBCT and that technical guidelines for CBCT examinations are established. This clearly structured book on CBCT will be an ideal aid in daily clinical practice. It clearly explains basic CBCT anatomy, examination technique, and the use of 3D reformatting software. A wide range of cases

are presented, covering the most frequent and relevant conditions and pathologies, including dental anomalies, inflammatory and degenerative disease, tumors, and implants.

## Cone Beam CT and 3D imaging

This book, now in an extensively revised second edition, is designed to provide the reader with a full understanding of the role of cone beam computed tomography (CBCT) in helping to solve many of the most challenging problems in endodontics. It will shorten the learning curve in application of this exciting imaging technology in a variety of contexts: difficult diagnostic cases, treatment planning, evaluation of internal tooth anatomy prior to root canal therapy, nonsurgical and surgical treatments, early detection and treatment of resorptive defects, and outcomes assessment. The ability to obtain an accurate 3D representation of a tooth and the surrounding structures by means of noninvasive CBCT imaging is changing the approach to clinical decision making in endodontics. Clinicians long accustomed to working in very small, three-dimensional spaces are no longer constrained by the limitations of two-dimensional imaging. The challenges of mastering the new technology can, however, be daunting. The detailed guidance contained in this book will help endodontists to take full advantage of the important benefits offered by CBCT.

## 3D Imaging in Endodontics

This superbly illustrated book provides a comprehensive overview of guided endodontics, a technology-driven, contemporary treatment approach that represents a paradigm shift in endodontics. Guided endodontics is now the proven, safe, predictable and, clinically, the most effective method for management of calcified root canals and root-end resection surgeries. This book covers detailed step-by-step digital treatment planning and the clinical application of static guides and dynamic navigation systems for, both, surgical and non-surgical endodontic treatment. In essence, this novel technology utilizes preoperative CBCT scans and intra-oral 3D scans as well as uniquely developed special software, for virtual planning of the endodontic treatment. This book delineates 3D printing, CBCT, digital impression systems, static guide designing with different software and clinical application of static and dynamic navigation in endodontics and much more. The concluding chapter addresses the future trends in 3D guidance in endodontics, in particular, and dentistry in general.

## Guided Endodontics

This issue of the Atlas of the Oral and Maxillofacial Surgery Clinics of North America focuses on Computer Aided Oral and Maxillofacial Surgery, and is edited by Dr. Kevin Arce. Articles will include: Computer Aided Planning and Placement in Implant Surgery; Patient-specific CAD-CAM Osteosynthesis in Orthognathic Surgery; 3-D Soft Tissue Simulation in Orthognathic Surgery; Computer Assisted Design and Manufacturing in Combined Orthognathic and Temporomandibular Joint Surgery; Computer Aided Design and Manufacturing in the Management of Craniofacial Congenital Deformities; Computer Assisted Planning and Intraoperative Navigation in the Management of Temporomandibular Joint Ankyloses; 3-D Computer-assisted Surgical Planning, Manufacturing, Intraoperative Navigation and CT in Maxillofacial Trauma; 3-D Computer Assisted Surgical Planning, Manufacturing and Intraoperative Navigation in Oncologic Surgery; 3-D Computer Assisted Surgical Planning and Manufacturing in Complex Mandibular Reconstruction; 3-D Computer Assisted Surgical Planning and Manufacturing in Complex Maxillary Reconstruction; Developing an In-House Computer Assisted and Manufacturing Program for Craniomaxillofacial Surgery; Integration of Minimally Invasive Orthognathic Surgery and 3D Virtual Planning in Orthognathic Surgery; and more!

## Guided Oral and Maxillofacial Surgery An Issue of Atlas of the Oral & Maxillofacial Surgery Clinics, E-Book

This book offers up-to-date, readily understandable guidance on the materials and equipment employed in digital restorative dentistry and on the specific clinical procedures that may be performed using the new technologies. The key components of digital restorative dentistry – image acquisition, prosthetic/restorative design, and fabrication – are fully addressed. Readers will find helpful information on scanners, the software for prosthetic design, and the materials and technologies for prosthesis fabrication, including laser sintering, 3D printing, CAD/CAM, and laser ablation. The section on clinical procedures explains all aspects of the use of digital technologies in the treatment of patients requiring removable partial dentures, complete dentures, fixed partial prostheses, crowns, endodontics, and implant surgery and prosthodontics. The field of restorative and prosthetic dentistry is undergoing

rapid transition as these new technologies come to play an increasingly central role in everyday dental practice. In bridging the knowledge gap that this technological revolution has created in the field of dentistry, the book will satisfy the needs of both dentists and dental students.

## Digital Restorative Dentistry

Step-by-Step, Color Presentation of CGIP in Everyday Clinical Practice Computer-guided implant placement (CGIP) helps clinicians precisely implement a treatment plan and accurately place implants with the use of three-dimensional interactive imaging software. The software enables the direct link between anatomic interpretation, surgical and prosthetic treatment planning, and precise surgical execution. Bone preparation, in relation to the position, angle, and depth of the implant, is guided through computerized digital procedures and patient-specific surgical guides are developed to obtain the optimum result of the insertion of implants in predetermined, prosthetically acceptable positions. In color throughout, Clinical Application of Computer-Guided Implant Surgery covers the practical application of CGIP in a simple but detailed manner. Step by step, the book guides you on diagnosis and treatment planning, applying the specialized software, and using the necessary instruments and surgical guides. It also explores the strengths and weaknesses of CGIP and discusses literature related to the accuracy and clinical relevance of CGIP. Using numerous images from clinical cases, this color book helps you understand the treatment pathway, radiographic guides, virtual teeth, imaging techniques, and computer software used for CGIP. The authors—experts in periodontics and image-guided surgery—describe this new philosophy in a way that you can incorporate in your daily clinical practice.

## Clinical Application of Computer-Guided Implant Surgery

Digital equipment in all dental practices is commonplace. From digital imaging through electronic recordkeeping, general dentists and specialists are seeing more accurate diagnoses, faster treatment times, and lower costs for equipment. Here in one volume is a comprehensive look at the digital technology available, describing indications, contraindications, advantages, disadvantages, limitations, and applications in the various dental fields. Included are digital imaging, digital impressions, digital operative dentistry, digital prosthodontics, digital implant fabrication and placement, and digital applications in endodontics, orthodontics, and oral surgery. The book is ideal for dental students seeking a reference for digital dental technology and for seasoned practitioners and specialists interested in incorporating digital technology in their daily practice.

## Clinical Applications of Digital Dental Technology

This book presents up-to-date information on promising indications for ultrasound in contemporary periodontics and implant therapy with the aim of assisting researchers and dental practitioners to use this novel imaging modality to advance research and patient care. Readers will find clear guidance on the application of ultrasound for evaluation of periodontal and peri-implant tissues. The mechanism of ultrasound imaging is explained in detail and compared to other imaging modalities. Furthermore, the role of ultrasound in the planning and execution of implant surgery and the assessment of implant stability is discussed. The book closes by considering the potential dental applications of functional ultrasound and volumetric ultrasound. This book will potentially be of high values for dental surgeons, periodontists, general dentists, orthodontists, dental hygienists, dental assistants, dental researchers and other practitioners, etc.

## Dental Ultrasound in Periodontology and Implantology

Accompanying CD-ROM contains ... "an 'average' template and larger and smaller 'normal' templates ... Also provided are instructions for the digital application of the templates to accommodate skulls of all sizes."--Page ix.

## Radiographic Cephalometry

This book covers the most suitable techniques for the rehabilitation of patients experiencing tooth loss, trauma or other situations resulting in bone atrophy. The book discusses current technologies, from diagnosis to treatment and surgery, applied to atrophic jaws using innovative tools and new PSI (patient specific implant) approaches. Oral Rehabilitation of the Atrophic Maxilla and the selection of the best treatment options for patients is one of the most difficult tasks facing the profession today. Readers will be able to solve complex problems and evaluate all available applications for patient

management. Zygomatic implants, reconstructive surgery with bone grafts, post-oncologicasl and post traumatic reconstructions as well as dynamic navigation and robot assisted dental surgery are covered. The book is written by recognized experts and leaders in the field, and includes simpler techniques within the reach of many implantologists and more complex techniques that require specific surgical skills. It is relevant for, implanologist, periodontists, oral and maxillofacial surgeon, prosthodontists and every clinician treating maxillary atrophy.

## Implants and Oral Rehabilitation of the Atrophic Maxilla

An indispensable introduction to using digital technology in dentistry Digital Dentistry: A Step-by-Step Guide and Case Atlas provides basic information on the use of digital resources to find a diagnosis, create a treatment plan, and execute that strategy within different dental specialisms. This manual includes the science behind all procedures that use digital technology and provides a clinical step-by-step guide toward the use of these developments for every dental specialty area. Users will find a wide range of areas covered, from prosthodontics, restorative dentistry, and endodontics to oral and maxillofacial surgery and public health. This book also includes: A guide to all current basic digital imaging and CAD-CAM procedures, with an emphasis on the most popular systems and software programs. An atlas of multidisciplinary cases that were treated with digital dentistry, from diagnosis and treatment planning to execution and follow-up, in order of complexity Assessment of the scientific basis for using digital dentistry in each category A presentation of clinical cases to support the use of digital methodologies in all relevant scenarios An exploration of the role of digital dentistry in dental public health, preventive dentistry, and dental education Ideal for dental clinicians—general practitioners and specialists—as well as all other dental professionals, such as dental technologists, dental hygienists, and dental students, Digital Dentistry: A Step-by-Step Guide and Case Atlas is an essential tool and reference work to help dental practitioners streamline and update their practice with the most up-to-date technologies.

## Digital Dentistry

This issue of Dental Clinics updates topics in CBCT and Dental Imaging. Articles will cover: basic principles of CBCT; artifacts interfering with interpretation of CBCT; basic anatomy in the three anatomic planes of section; endodontic applications of CBCT; pre-surgical implant site assessment; software tools for surgical guide construction; CBCT for the nasal cavity and paranasal sinuses; CBCT and OSA and sleep disordered breathing; update on CBCT and orthodontic analyses; liabilities and risks of using CBCT; reporting findings in a CBCT volume, and more!

## Cone Beam Computed Tomography: From Capture to Reporting, An Issue of Dental Clinics of North America,

The ideal goal of modern dentistry is to restore the patient to normal contour, function, comfort, esthetics, speech, and health. What makes implant dentistry unique is the ability to achieve this ideal goal regardless of the atrophy, disease, or injury of the stomatognathic system. The mere knowledge of the technique of implant treatment is not sufficient to eliminate all problems, the dentist has to be able to analyze a given clinical situation and evaluate the complexity. These imaging modalities contribute information for every stage of the treatment, extending from pre-surgical diagnosis and treatment planning, through surgical placement and postoperative assessment of the implant, into the prosthetic restoration and long-term surveillance phase. So, to develop and implement a cohesive and comprehensive treatment plan, diagnosis and imaging play a major role. The purpose of implant imaging is to assist the implant team in restoring the patient's occlusion and function by providing accurate and reliable diagnostic information on the patient's anatomy at the proposed implant sites. The development of precise pre-surgical imaging techniques and surgical templates allow the dentist to place these implants with relative ease & predictability.

## Imaging and Implantology

The fourth edition of Implant Restorations: A Step-by-Step Guide provides a wealth of updated and expanded coverage on detailed procedures for restoring dental implants. Focusing on the most common treatment scenarios, it offers concise literature reviews for each chapter and easy-to-follow descriptions of the techniques, along with high-quality clinical photographs demonstrating each step. Comprehensive throughout, this practical guide begins with introductory information on incorporating implant restorative dentistry in clinical practice. It covers diagnosis and treatment planning and digital

dentistry, and addresses advances in cone beam computerized tomography (CBCT), treatment planning software, computer generated surgical guides, rapid prototype printing and impression-less implant restorative treatments, intra-oral scanning, laser sintering, and printing/milling polymer materials. Record-keeping, patient compliance, hygiene regimes, and follow-up are also covered. Provides an accessible step-by-step guide to commonly encountered treatment scenarios, describing procedures and techniques in an easy-to-follow, highly illustrated format Offers new chapters on diagnosis and treatment planning and digital dentistry Covers advances in cone beam computerized tomography (CBCT), computer generated surgical guides, intra-oral scanning, laser sintering, and more An excellent and accessible guide on a burgeoning subject in modern dental practice by one of its most experienced clinicians, Implant Restorations: A Step-by-Step Guide, Fourth Edition will appeal to prosthodontists, general dentists, implant surgeons, dental students, dental assistants, hygienists, and dental laboratory technicians.

## Implant Restorations

Digital Workflow in Reconstructive Dentistry is the result of efforts made by the academic team at the Department of Prosthodontics, University Hospital of Freiburg. It aims to build a fundamental understanding of the general principles, science, and clinics of digital dental medicine. The information provided within these pages summarizes the various components of the digital workflow in reconstructive dentistry and discusses their advantages and disadvantages. Moreover, insights are provided about upcoming, game-changing technologies. By reading this book, students, clinicians, and researchers will gain and enhance their knowledge about digital dental medicine and identify the areas they need to focus on next in order to integrate the available technologies in their daily work. Clearly, the path of digital dental medicine will not stop here. Contributors Amirah M. R. Alammar • Abdulaziz Alsahaf • Wael Att • Maria Bateli • Jasmin Bernhart • Shaza Bishti • Sarah Blattner • Miha Brezavš ek • Sandy Cepa • Nadine Emmanoulidi • Ahmed Fawzy • Manrique Fonseca • Michele Frapporti • Rumpa Ganguly • Yousef Al-Ghamdi • Petra Ch. Gierthmuehlen • Aiste Gintaute • Ulrich Lamott • Christos Lamprinos • Matthias Petsch • Udo Plaster • Aikaterini Ploumaki • Hanna Rauberger • Elisabeth Schwartzkopff • Christian F. Selz • Thamer Al-Sharif • Benedikt Spies • Frank A. Spitznagel • Jörg R. Strub • Michael Swain • Taskin Tuna • Alexander Vuck • Siegbert Witkowski

## Digital Workflow in Reconstructive Dentistry

Digital planning of implant therapy ensures predictable and successful treatment by allowing clinicians to visualize the surgical procedure before they perform it. With this goal in mind, this book lays out the latest research on implant dentistry as well as effective case presentations to demonstrate cutting-edge imaging and surgical techniques. Readers are guided through the process of using digital tools at every stage of treatment, from developing the treatment plan to surgical execution. The authors detail the specifications of guided surgical procedures, review the latest 3D radiology options and software currently available, and present full case studies with stunning photographs. As implant dentistry relies more and more on digital technology, clinicians owe it to their patients to educate themselves on the most current tools available, and this book is the perfect place to start.

## Digital Implantology

Imaging is a key part of clinical practice. To maximise the potential benefit to their patients, dentists need to have an understanding of how imaging systems work. In the 21st century, we are faced with major technological developments in radiology, of which many dentists will be unfamiliar. This book aims to address these challenges by providing a comprehensive introduction to state-of-the-art dental imaging, in particular to the complexities of digital radiology and the advanced techniques available for cross-sectional imaging.

## Twenty-First Century Imaging

Para aquellos que están buscando la transición de las radiografías 2D a los métodos 3D, este texto explica el uso de la imagen volumétrica en la práctica clínica y detalla las indicaciones para su uso en todos los campos de la odontología. Se proporcionan amplias indicaciones sobre el procesamiento de imagen y sobre cómo leer los escáneres CBCT, incluyendo un atlas anatómico global. Además, los autores explican cómo obtener reconstrucciones volumétricas 3D y utilizarlos en en simulaciones informáticas para planear las fases del tratamiento quirúrgico. Los autores inciden en los temas de mayor interés clínico, incluyendo diagnósticos cefalométricos y una nueva aproximación al análisis

estético, el análisis del circuito anatómico del aire en la apnea del sueño, una revisión general de los senos maxilares y las cirugías clínicas relacionadas con ellos, y la planificación del tratamiento para la cirugía implantológica guiada.

## 3D Imaging and Dentistry

This book is designed to serve as an up-to-date reference on the use of cone-beam computed tomography for the purpose of 3D imaging of the craniofacial complex. The focus is in particular on the ways in which craniofacial 3D imaging changes how we think about conventional diagnosis and treatment planning and on its clinical applications within orthodontics and oral and maxillofacial surgery. Emphasis is placed on the value of 3D imaging in visualizing the limits of the alveolar bone, the airways, and the temporomandibular joints and the consequences for treatment planning and execution. The book will equip readers with the knowledge required in order to apply and interpret 3D imaging to the benefit of patients. All of the authors have been carefully selected on the basis of their expertise in the field. In describing current thinking on the merits of 3D craniofacial imaging, they draw both on the available scientific literature and on their own translational research findings.

## Craniofacial 3D Imaging

Part I: Theory and Rationale; 1. Anatomical Obstacles to Implant Placement; 2. Bone Grafts; 3. Computer-Assisted Implant Surgery; 4. Maxillary Sinus: the Role of the Otolaryngologist; 5. Pharmacological Management of Patients. --; Part II: Clinical Cases / Marco Rinaldi. -- Section A: Computer-Guided Applications for Dental Implants; CC1 Maxillary partially edentulism, guided implantology; CC2 Partial edentulism, guided implantology; CC3 Mandibular single edentulism, guided implantology; CC4 Maxillary partial edentulism flapless guided implantology; CC5 Lateral incisor agenesis with narrow space between incisor and canine, immediate loading; CC6 Mandibular edentulism, flapless guided implantology; CC7 Mandibular edentulism, tilted implants, guided implantology; CC8 Mandibular edentulism, guided implantology, tilted implants; CC9 Mandibular edentulism, guided implantology, tilted implants; CC10 Maxillary edentulism, guided implantology , tilted implants; CC11 Maxillary edentulism, guided implantology, tilted implants; CC12 Maxillary and mandibular edentulism, guided implantology, tilted implants; CC13 Maxillary and mandibular edentulism, guided implantology, tilted implants, immediate loading; CC14 Maxillary edentulism, guided implantology, tilted implants; CC15 Maxillary edentulism angled implants and digital cast; CC16 VIDEO: Extractions with simultaneous implants placement Reduction guide; CC17 VIDEO: Supernumerary impacted teeth; Section B: Computer-Guided Applications for Bone Grafting and Reconstructive Surgery; CC18 VIDEO: Maxillary and mandibular severe bone defects bone grafting; CC 19 VIDEO: Maxillary severe bone defects bone grafting; CC 20; Maxillary Edentulism, bone and sinus graft planned on STL model, guided implantology; CC21 VIDEO: Maxillary Edentulism, cystectomy and bone graft planned on STL model, guided implantology, immediate implant placements; CC22 Maxillary Edentulism, bone graft planned on STL model, guided implantology; CC23 Maxillary Edentulism, bone graft planned on STL model, guided implantology; CC24 Maxillary Edentulism, bone and sinus graft planned on STL model, guided implantology; CC25 Maxillary Edentulism, sinus and bone graft planned on STL model, tilted implants; CC26 Maxillary and mandibular edentulism, bone grafts, planned on STL model, guided implantology; CC27 Maxillary edentulism, sinus and bone graft planned on STL model, guided implantology; CC28 VIDEO: Posterior Mandibular Bone defects in thickness and height; CC29 Posterior Mandibular Bone defects in thickness and height; CC30 Bilateral agenesis of lateral incisors with bone defect in thickness harvesting bone from mandibular body and ascending ramus; CC31 Mandibular partially edentulism bone graft planned on STL model; CC32 Maxillary edentulism, sinus graft with heterologous bone block, performed on STL model; CC33 VIDEO: Bilateral sinus floor augmentation, harvesting bone from Posterior Superior Iliac Spine; CC34 Sinus floor augmentation in presence of sinus septa, harvesting bone from Posterior Superior Iliac Spine; CC35 Partially edentulism, bilateral sinus grafts planned on STL model; CC36 Sinus floor augmentation and implant placement; CC37 VIDEO: Sinus floor augmentation and implant placement; CC38 Sinus floor augmentation with stereolithographic sinus graft guide with implants placement 20B; CC39 VIDEO: Bilateral sinus augmentation; CC40 VIDEO: Zygomatic implant in a case of Hemimaxillectomy.

## Computer-guided Applications

In guided implant surgery, dentists utilize advanced machinery and imaging technology to guide them to manufacture and place implants more efficiently, precisely, and accurately. This new and improved

dental implant surgery allows the dentist to have a more complete picture of the patient's mouth and accurately produce the most appropriate dental implants. These steps that used to require many dental office visits can now be performed on the same day, concluding with the surgery. The evaluation of 3D data extracted from computerized tomography, but also more recently from optical scanner, together with modern implant planning software, allows to carefully simulate surgical and prosthetic phases. Implant sites can be decided before surgery according to bone volume and quality, location of anatomical structures (nerves, vessels, sinuses), prosthetic and aesthetic evaluations, and accurate one-to-one measurements of the width and height of bone in planned implant sites. The distances and angulations between implants can also be calculated. Moreover, a careful three-dimensional positioning of the implants allows for obtaining the best clinical results, especially in regard to aesthetic aspects. Guided implant surgery (GIS) allows to transfer planned rehabilitation projects directly into the surgical field. Guided-implant surgery could also be needed for minimally traumatic or flapless surgery, optimal implant positioning and immediate loading, along with the reduction of post operative pain.

## Digital Implant Planning and Guided Implant Surgery

This color atlas and manual provides clinicians with systematic, standardized, but also individualized step-by-step guidance on 3D virtual diagnosis, treatment planning, and outcome assessment in patients undergoing orthognathic surgery for maxillofacial deformities. Drawing on 20 years of experience, the authors elucidate the clinical potential of the approach while also highlighting current pitfalls and limitations. The opening two chapters discuss the 3D imaging workflow and its integration into daily clinical routine and comprehensively describe cone-beam CT virtual diagnosis. The stepwise 3D virtual planning of orthognathic surgery and transfer of the 3D virtual treatment plan to the patient in the operating room are then thoroughly explained, and the unprecedented potential of 3D virtual evaluation of treatment outcome, documented. Finally, after provision of all this essential background information, the closing chapter illustrates the application of the 3D virtual approach in different types of maxillofacial deformity. Orthodontists and orthognathic and orthofacial surgeons will find 3D Virtual Treatment Planning of Orthognathic Surgery to be a superb guide and resource.

## 3D Virtual Treatment Planning of Orthognathic Surgery

This book is an accurate introduction to guided implantology. As practitioners with many years of experience, the authors present an important basis for scientific findings and a valid decision-making aid for digital oral surgery. Readers are invited to learn step by step about full guided surgery. Numerous full color images demonstrate the anatomical details and risks during implantation. On top, cases are included for effective case and know-how presentation. In addition, the current literature is presented. Overall, this work appeals to beginners and experts alike.

## Guided Surgery in Implantology

Cone beam volumetric imaging (CBVI) has become an indispensable part of dentistry. Quintessence's standard reference book on CBVI has been completely revised in order to keep up with the plethora of new developments. This Second Edition is now available in atlas format with large-sized illustrations. This comprehensive work serves as a daily reference for the interpretation of CBVI images and is intended as a reference guide for test preparation for the CBVI certification exam.

## Cone Beam Volumetric Imaging in Dental, Oral and Maxillofacial Medicine

This book provides evidence-based guidance on the clinical applications of digital dentistry, that is, the use of dental technologies or devices that incorporate digital or computer-controlled components for the performance of dental procedures. Readers will find practically oriented information on the digital procedures currently in use in various fields of dental practice, including, for example, diagnosis and treatment planning, oral radiography, endodontics, orthodontics, implant dentistry, and esthetic dentistry. The aim is to equip practitioners with the knowledge required in order to enhance their daily practice. To this end, a problem-solving approach is adopted, with emphasis on key concepts and presentation of details in a sequential and easy to follow manner. Clear recommendations are set out, and helpful tips and tricks are highlighted. The book is written in a very readable style and is richly illustrated. Whenever appropriate, information is presented in tabular form to provide a ready overview of answers to frequent doubts and questions.

## Computer-Guided Applications for Dental Implants, Bone Grafting, and Reconstructive Surgery (Adapted Translation) - Elsevier EBook on Vitalsource (Ret

The book provides a comprehensive description of the fundamental operational principles, technical details of acquiring and specific clinical applications of dental and maxillofacial cone beam computed tomography (CBCT). It covers all clinical considerations necessary for optimal performance in a dental setting. In addition overall and region specific correlative imaging anatomy of the maxillofacial region is described in detail with emphasis on relevant disease. Finally imaging interpretation of CBCT images is presented related to specific clinical applications. This book is the definitive resource for all who refer, perform, interpret or use dental and maxillofacial CBCT including dental clinicians and specialists, radiographers, ENT physicians, head and neck, and oral and maxillofacial radiologists.

## Specialty Imaging

Radiographic cephalometry has been one of the most With "Three-Dimensional Cephalometry - A Color important diagnostic tools in orthodontics, since its Atlas and Manual"by the authors Swennen, Schutyser introduction in the early 1930s by Broadbent in the and Hausamen you have an exciting book in your United States and Hofrath in Germany. Generations of hands. It shows you how the head can be analysed in orthodontists have relied on the interpretation of these three dimensions with the aid of 3D-cephalometry. images for their diagnosis and treatment planning as Of course, at the moment the technique is not available well as for the long-term follow-up of growth and in every orthodontic of?ce around the corner. H- treatment results. Also in the planning for surgical ever, especially for the planning of more complex orthodontic corrections of jaw discrepancies, lateral cases where combined surgical - orthodontic tre- and antero-posterior cephalograms have been valu- ment is indicated, it is my sincere conviction that wi- able tools. For these purposes numerous cephalomet- in 10 years time 3D cephalometry will have changed ric analyses are available. However, a major drawback our way of thinking about planning and clinical of the existing technique is that it renders only a two- handling of these patients. dimensional representation of a three-dimensional structure

## Digitization in Dentistry

Maxillofacial Cone Beam Computed Tomography