Siemens Ct Scanner Somatom Service Manual File Type

Over the past few decades, the radiological science community has developed and applied numerous models of the human body for radiation protection, diagnostic imaging, and nuclear medicine therapy. The Handbook of Anatomical Models for Radiation Dosimetry provides a comprehensive review of the development and application of these computational models, known as "phantoms." An ambitious and unparalleled project, this pioneering work is the result of several years of planning and preparation involving 64 authors from across the world. It brings together recommendations and information sanctioned by the International Commission on Radiological Protection (ICRP) and documents 40 years of history and the progress of those involved with cutting-edge work with Monte Carlo Codes and radiation protection dosimetry. This volume was in part spurred on by the ICRP’s key decision to adopt voxelized computational phantoms as standards for radiation protection purposes. It is an invaluable reference for those working in that area as well as those employing or developing anatomical models for a a number of clinical applications. Assembling the work of nearly all major phantom developers around the world, this volume examines: The history of the research and development in computational phantoms Detailed accounts for each of the well-known phantoms, including the MIRD-5, GSF Voxel Family Phantoms, NCAT, UF Hybrid Pediatric Phantoms, VIP-Man, and the latest ICRP Reference Phantoms Physical phantoms for experimental radiation dosimetry The smallest voxel size (0.2 mm), phantoms developed from the Chinese Visible Human Project Applications for radiation protection dosimetry involving environmental, nuclear power plant, and internal contamination exposures Medical applications, including nuclear medicine therapy, CT examinations, x-ray radiological image optimization, nuclear medicine imaging, external photon and proton treatments, and management of respiration in modern image-guided radiation treatment Patient-specific phantoms used for radiation treatment planning involving two Monte Carlo code systems: GEANT4 and EGS Future needs for research and development Related data sets are available for download on the authors’ website. The breadth and depth of this work enables readers to obtain a unique sense of the complete scientific process in computational phantom development, from the conception of an idea, to the identification of original anatomical data, to solutions of various computing problems, and finally, to the ownership and sharing of results in this groundbreaking field that holds so much promise.

This book addresses the challenges companies face when different customer value propositions require them to pursue a differentiated supply chain strategy. It provides practical insights on how to achieve successful supply chain segmentation and presents the benefits this can yield for companies on the basis of best-in-class industry case studies from Gardena, Philips Luminaire, Siemens Healthcare and Volvo Construction Equipment. Drawing on these examples, it provides recommendations and solutions on how to define supply chain segmentation, and how to set up and implement a transformation program. Furthermore, it presents an in-depth discussion of the current theoretical background of supply chain segmentation and introduces the current trends and available frameworks. Offering readers specific, pragmatic guidance on the main challenges and opportunities and proposing ways to effectively measure efficiency and performance, the book concludes with the do’s, don’ts and most important aspects to keep in mind when considering an end-to-end segmentation.

Essential for students, science and medical graduates who want to understand the basic science of Positron Emission Tomography (PET), this book describes the physics, chemistry, technology and overview of the clinical uses behind the science of PET and the imaging techniques it uses. In recent years, PET has moved from high-end research imaging tool used by the highly specialized to an essential component of clinical evaluation in the clinic, especially in cancer management. Previously being the realm of scientists, this book explains PET instrumentation, radiochemistry, PET data acquisition and image formation, integration of structural and functional images, radiation dosimetry and protection, and applications in dedicated areas such as drug development, oncology, and gene expression imaging. The technologist, the science, engineering or chemistry graduate seeking further detailed information about PET, or the medical advanced trainee wishing to gain insight into the basic science of PET will find this book invaluable. This book is primarily repackaged content from the Basic Science section of the 'big' Valk book on PET. It contains new, completely revised and unchanged chapters covering the "basic sciences" section of the main book - total 18 chapters: 2 new (chapters 1, 16) 8 completely revised (chapters 4, 5, 8, 13, 14, 15, 17, 18) 3 minor corrections (chapters 2, 6, 11) 5 unchanged (chapters 3, 7, 9, 10, 12)

A guide to the trends and leading companies in the engineering, research, design, innovation and development business fields: those firms that are dominant in engineering-based design and development, as well leaders in technology-based research and development.

Global Value Chains and Production Networks: Case Studies of Siemens and Huawei presents theories and frameworks that facilitate the evolution of GPN studies, from macro perspectives based on territory and industry to the use of micro (firm-level) data. The book explores these theories and frameworks through detailed case studies of two major corporations, Siemens and Huawei. With the GPN/GVC structure of Chinese firms not well known outside China, despite the growing importance of Chinese firms in the global economy, this guide plays a pivotal role in facilitating the use of data that promise to unlock economic cooperation and value. Emphasizes micro-data analytical models and their methodological underpinnings Illustrates how these data illuminate the economic structures of two comparable GPNs within highly divergent institutional contexts Suggests how companies can cooperate with foreign partners to enhance their global management capacity and reshape their advantages in international competition

Written by the chief physicist at Johns Hopkins University Hospital, this easy-to-read short textbook explains the physics behind multi-detector CT technology, particularly newer,

more complex technology. The focus is on principles of physics, effects of scan parameters on image quality, and optimum radiation dosage. The book includes numerous key points summaries and questions to assist in exam preparation.

This book introduces the latest advances relating to the pathophysiology, biophysics, monitoring and treatment of traumatic brain injury, hydrocephalus, and stroke presented at the 16th International Conference on Intracranial Pressure and Neuromonitoring (the "ICP Conference"), held in Cambridge, Massachusetts, in June 2016 in conjunction with the 6th Annual Meeting of the Cerebral Autoregulation Research Network. Additionally, the conference held special sessions on neurocritical care informatics and cerebrovascular autoregulation. The peer-reviewed papers included were written by leading experts in neurosurgery, neurointensive care, anesthesiology, physiology, clinical engineering, clinical informatics and mathematics who have made important contributions in this translational area of research, and their focus ranges from the latest research findings and developments to clinical trials and experimental studies. The book continues the proud tradition of publishing key work from the ICP Conferences and is a must-read for anyone wishing to stay abreast of recent advances in the field.

Each issue includes separate but continuously paged sections called: Nuclear medicine, and: Ultrasound

Plunkett's Health Care Industry Almanac is the only complete reference to the American Health Care Industry and its leading corporations. Whatever your purpose for researching the health care field, you'll find this massive reference book to be a valuable guide. No other source provides this book's easy-to-understand comparisons of national health expenditures, emerging technologies, patient populations, hospitals, clinics, corporations, research, Medicare, Medicaid, managed care, and many other areas of vital importance. Included in the market research sections are dozens of statistical tables covering every aspect of the industry, from Medicare expenditures to hospital utilization, from insured and uninsured populations to revenues to health care expenditures as a percent of GDP. A special area covers vital statistics and health status of the U.S. population. The corporate analysis section features in-depth profiles of the 500 major for-profit firms (which we call “The Health Care 500”) within the many industry sectors that make up the health care system, from the leading companies in pharmaceuticals to the major managed care companies. Details for each corporation include executives by title, phone, fax, website, address, growth plans, divisions, subsidiaries, brand names, competitive advantage and financial results. Purchasers of either the book or PDF version can receive a free copy of the company profiles database on CD-ROM, enabling key word search and export of key information, addresses, phone numbers and executive names with titles for every company profiled.

This reference book is a complete guide to the trends and leading companies in the engineering, research, design, innovation and development business fields: those firms that are dominant in engineering-based design and development, as well leaders in technology-based research and development. We have included companies that are making significant investments in research and development via as many disciplines as possible, whether that research is being funded by internal investment, by fees received from clients or by fees collected from government agencies. In this carefully-researched volume, you'll get all of the data you need on the American Engineering & Research Industry, including: engineering market analysis, complete industry basics, trends, research trends, patents, intellectual property, funding, research and development data, growth companies, investments, emerging technologies, CAD, CAE, CAM, and more. The book also contains major statistical tables covering everything from total U.S. R&D expenditures to the total number of scientists working in various disciplines, to amount of U.S. government grants for research. In addition, you'll get expertly written profiles of nearly 400 top Engineering and Research firms - the largest, most successful corporations in all facets of Engineering and Research, all cross-indexed by location, size and type of business. These corporate profiles include contact names, addresses, Internet addresses, fax numbers, toll-free numbers, plus growth and hiring plans, finances, research, marketing, technology, acquisitions and much more. This book will put the entire Engineering and Research industry in your hands. Purchasers of either the book or PDF version can receive a free copy of the company profiles database on CD-ROM, enabling key word search and export of key information, addresses, phone numbers and executive names with titles for every company profiled.

In CT Suite the doctor and anthropologist Barry F. Saunders provides an ethnographic account of how a particular diagnostic technology, the computed tomographic (CT) scanner, shapes social relations and intellectual activities in and beyond the CT suite, the unit within the diagnostic radiology department of a large teaching hospital where CT images are made and interpreted. Focusing on how expertise is performed and how CT images are made into diagnostic evidence, he concentrates not on the function of CT images for patients but on the function of the images for medical professionals going about their routines. Yet Saunders offers more than insider ethnography. He links diagnostic work to practices and conventions from outside medicine and from earlier historical moments. In dialogue with science and technology studies, he makes a significant contribution to scholarship on the visual cultures of medicine. Saunders’s analyses are informed by strands of cultural history and theory including art historical critiques of realist representation, Walter Benjamin’s concerns about violence in “mechanical reproduction,” and tropes of detective fiction such as intrigue, the case, and the culprit. Saunders analyzes the diagnostic “gaze” of medical personnel reading images at the viewbox, the two-dimensional images or slices of the human body rendered by the scanner, methods of archiving images, and the use of scans as pedagogical tools in clinical conferences. Bringing cloistered diagnostic practices into public view, he reveals the customs and the social and professional hierarchies that are formulated and negotiated around the weighty presence of the CT scanner. At the same time, by returning throughout to the nineteenth-century ideas of detection and scientific authority that inform contemporary medical diagnosis, Saunders highlights the specters of the past in what appears to be a

preeminently modern machine.

Leveraging the organization and focus on exam preparation found in the comprehensive text, this Exam Review will help any student to successfully complete the ARRT General Radiography and Computed Tomography exams. The book includes a bulleted format review of content, Registry-style questions with answers and rationales, and a mock exam following the ARRT format. The companion website offers an online testing simulation engine.

In January 1995, 300 participants from Asia, USA, and Europe lively discussed the "State of the Art and Future Aspects of CT" in Peking, China. The workshop was designed to cover all essential aspects of modern CT imaging including the historical development, different techniques, contrast agents, organ systems, and indications. The comparative evaluation of CT versus MRI and ultrasound was a central topic. Additionally, a special session was dedicated to "Angiography Tomorrow". This book summarizes the state of the art in both conventional and spiral CT imaging and provides some suggestions as for the future role of the method.

Since its introduction in 1972, X-ray computed tomography (CT) has evolved into an essential diagnostic imaging tool for a continually increasing variety of clinical applications. The goal of this book was not simply to summarize currently available CT imaging techniques but also to provide clinical perspectives, advances in hybrid technologies, new applications other than medicine and an outlook on future developments. Major experts in this growing field contributed to this book, which is geared to radiologists, orthopedic surgeons, engineers, and clinical and basic researchers. We believe that CT scanning is an effective and essential tools in treatment planning, basic understanding of physiology, and and tackling the ever-increasing challenge of diagnosis in our society.

PET and SPECT are two of today’s most important medical-imaging methods, providing images that reveal subtle information about physiological processes in humans and animals. Emission Tomography: The Fundamentals of PET and SPECT explains the physics and engineering principles of these important functional-imaging methods. The technology of emission tomography is covered in detail, including historical origins, scientific and mathematical foundations, imaging systems and their components, image reconstruction and analysis, simulation techniques, and clinical and laboratory applications. The book describes the state of the art of emission tomography, including all facets of conventional SPECT and PET, as well as contemporary topics such as iterative image reconstruction, small-animal imaging, and PET/CT systems. This book is intended as a textbook and reference resource for graduate students, researchers, medical physicists, biomedical engineers, and professional engineers and physicists in the medical-imaging industry. Thorough tutorials of fundamental and advanced topics are presented by dozens of the leading researchers in PET and SPECT. SPECT has long been a mainstay of clinical imaging, and PET is now one of the world’s fastest growing medical imaging techniques, owing to its dramatic contributions to cancer imaging and other applications. Emission Tomography: The Fundamentals of PET and SPECT is an essential resource for understanding the technology of SPECT and PET, the most widely used forms of molecular imaging. *Contains thorough tutorial treatments, coupled with coverage of advanced topics *Three of the four holders of the prestigious Institute of Electrical and Electronics Engineers Medical Imaging Scientist Award are chapter contributors *Include color artwork

Serves as a useful reference to the American Health Care Industry and its leading corporations. This book provides comparisons of national health expenditures, various technologies, patient populations, hospitals, clinics, corporations, research, Medicare, Medicaid, managed care, and many other areas of vital importance.

Identicication of Pathological Conditions in Human Skeletal Remains provides an integrated and comprehensive overview of pathological conditions that affect the human skeleton. The primary objective is to assist those who conduct research on archeological skeletal remains in interpreting abnormal conditions that they might encounter in the course of their research. However, there is much that ancient skeletal remains can reveal to the modern orthopedist, pathologist, forensic anthropologist, and radiologist about the skeletal manifestations of diseases that are rarely encountered in modern medical practice. The medical historian will find information on the antiquity and early geographical distribution of many diseases. All of the major categories of disease that affect bone are reviewed on the basis of the literature on the radiology and pathology of these diseases. This review is followed by a discussion of the literature on the paleopathological cases thought to represent each of the morbid categories affecting bone. This book is based on extensive individual and collaborative research by the author and contributing authors on the known parameters of basic calcified tissue biology and modern skeletal diseases and their expression in antiquity. The monograph provides essential text and illustrative materials on bone pathology, which will improve the diagnostic ability of those interested in human dry bone pathology. It also provides time depth to our understanding of the effect of disease on past human populations. Key Features * Comprehensive review of skeletal diseases encountered in archeological human remains * More than 1100 photographs and line drawings illustrating skeletal diseases including both microscopic and gross features * Based on extensive research on skeletal paleopathology in many countries for over 35 years * Review of important theoretical issues in interpreting evidence of skeletal disease in archeological human populations

Computed Tomography TechnologyW.B. Saunders CompanySupply Chain SegmentationBest-in-Class Cases, Practical Insights and FoundationsSpringer

This book contains the papers of the 7th International Workshop on Medical and Service Robots (MESROB) that was planned to be held in Basel, Switzerland, in July 2020. Since the conference could not be held due to the worldwide Corona pandemic, the proceedings are published in this book and presentation of the accepted papers will be postponed to next year’s conference (MESROB 2021). The main topics of the workshop include: design of medical devices, kinematics and dynamics for medical robotics, exoskeletons and prostheses, anthropomorphic hands, therapeutic robots and rehabilitation, cognitive robots, humanoid and service robots, assistive robots and elderly assistance, surgical robots, human-robot interfaces, haptic devices, medical treatments, medical lasers, and surgical planning and navigation. The contributions, which were selected by means of a rigorous international peer-review process, highlight numerous exciting ideas that will spur novel research directions and foster multidisciplinary collaboration among different specialists, demonstrating that medical and service robotics will drive the technological and societal change in the coming decades.

This carefully-researched book covers exciting trends in consulting in such fields as marketing, information technology, management, logistics, supply chain, manufacturing, health care and

more. Includes complete details on the prestigious management consulting sector, plus our analysis of the information technology consulting business. This reference tool includes thorough market analysis as well as our highly respected trends analysis. You'll find a complete overview, industry analysis and market research report in one superb, value-priced package. It contains thousands of contacts for business and industry leaders, industry associations, Internet sites and other resources. This book also includes statistical tables, an industry glossary and thorough indexes. The corporate profiles section of the book includes our proprietary, in-depth profiles of the 275 leading companies in all facets of consulting. Here you'll find complete profiles of the hot companies that are making news today, the largest, most successful corporations in the business. Purchasers of either the book or PDF version can receive a free copy of the company profiles database on CD-ROM, enabling key word search and export of key information, addresses, phone numbers and executive names with titles for every company profiled.

X-ray computed tomography has been used for several decades as a tool for measuring the three-dimensional geometry of the internal organs in medicine. However, in recent years, we have seen a move in manufacturing industries for the use of X-ray computed tomography; first to give qualitative information about the internal geometry and defects in a component, and more recently, as a fully-quantitative technique for dimensional and materials analysis. This trend is primarily due to the ability of X-ray computed tomography to give a high-density and multi-scale representation of both the external and internal geometry of a component, in a non-destructive, non-contact and relatively fast way. But, due to the complexity of X-ray computed tomography, there are remaining metrological issues to solve and the specification standards are still under development. This book will act as a one-stop-shop resource for students and users of X-ray computed tomography in both academia and industry. It presents the fundamental principles of the technique, detailed descriptions of the various components (hardware and software), current developments in calibration and performance verification and a wealth of example applications. The book will also highlight where there is still work to do, in the perspective that X-ray computed tomography will be an essential part of Industry 4.0.

The Global Practice of Forensic Science presents histories, issues, patterns, and diversity in the applications of international forensic science. Written by 64 experienced and internationally recognized forensic scientists, the volume documents the practice of forensic science in 28 countries from Africa, the Americas, Asia, Australia and Europe. Each country’s chapter explores factors of political history, academic linkages, the influence of individual cases, facility development, types of cases examined, integration within forensic science, recruitment, training, funding, certification, accreditation, quality control, technology, disaster preparedness, legal issues, research and future directions. Aimed at all scholars interested in international forensic science, the volume provides detail on the diverse fields within forensic science and their applications around the world.

Throughout history, humanity has been plagued by a myriad of humanitarian crises that seemingly take the form of perpetual human suffering. Today, approximately 125,000,000 people require humanitarian assistance as the result of famine, war, geopolitical conflict, and natural disasters. A core component of this suffering is afflictions related to human health, where disturbances strain or overwhelm the existing healthcare infrastructure to create the conditions for an increase in morbidities and co-morbidities. One of the more startling elements is the loss of life to preventable medical conditions that were not properly treated or even diagnosed in the field, and is often due to the limited interventional capacity that medical teams and humanitarian practitioners have in these scenarios. These individuals are often hindered by medical equipment deficiencies or devices not meant to function in austere conditions. The development of highly versatile, feasible, and cost-effective medical devices and technologies that can be deployed in the field is essential to enhancing medical care in unconventional settings. In this book we examine the nature of the creative problem-solving paradigm, and dissect the intersection of frugal, disruptive, open, and reverse innovation processes in advancing humanitarian medicine. Specifically, we examine the feasible deployment of these devices and technologies in unconventional environments not only by humanitarian aid and disaster relief agencies, but also by crisis-affected communities themselves. The challenge is complex, but the financial support and technical development of innovative solutions for the delivery of humanitarian aid is a process in which everyone is a stakeholder.

Build the foundation necessary for the practice of CT scanning with Computed Tomography: Physical Principles, Clinical Applications, and Quality Control, 4th Edition. Written to meet the varied requirements of radiography students and practitioners, this two-color text provides comprehensive coverage of the physical principles of CT and its clinical applications. Its clear, straightforward approach is designed to improve your understanding of sectional anatomic images as they relate to CT — and facilitate communication between CT technologists and other medical personnel. Comprehensively covers CT at just the right depth for technologists – going beyond superficial treatment to accommodate all the major advances in CT. One complete CT resource covers what you need to know! The latest information on advances in CT imaging, including: advances in volume CT scanning; CT fluoroscopy; multi-slice applications like 3-D imaging, CT angiography, and virtual reality imaging (endoscopy) – all with excellent coverage of state-of-the-art principles, instrumentation, clinical applications, and quality control. More than 600 photos and line drawings help students understand and visualize concepts. Chapter outlines show you what is most important in every chapter. Strong ancillary package on Evolve facilitates instructor preparation and provides a full complement of support for teaching and learning with the text NEW! Highlights recent technical developments in CT, such as: the iterative reconstruction; detector updates; x-ray tube innovations; radiation dose optimization; hardware and software developments; and the introduction of a new scanner from Toshiba. NEW! Learning Objectives and Key Terms at the beginning of every chapter and a Glossary at the end of the book help you organize and focus on key information. NEW! End-of-Chapter Questions provide opportunity for review and greater challenge. NEW! An added second color aids in helping you read and retain pertinent information

Obtaining and interpreting images of the heart is critical to the successful management of any cardiac disorders. Several imaging modalities are used to help cardiologists correctly diagnose these disorders and initiate the most appropriate form of treatment.Since the first publication of this book, the use of cardiovascular CT imaging has increase

This book offers a comprehensive review of the rapidly advancing field of endovascular therapy, written by internationally recognized authorities in the field, many of whom are

the innovators of the techniques and devices involved. Broad in scope, topics covered range from how to obtain training in approved endovascular techniques to promising new lines of investigational therapies.

Ortner's Identification of Pathological Conditions in Human Skeletal Remains, Third Edition, provides an integrated and comprehensive treatment of the pathological conditions that affect the human skeleton. As ancient skeletal remains can reveal a treasure trove of information to the modern orthopedist, pathologist, forensic anthropologist, and radiologist, this book presents a timely resource. Beautifully illustrated with over 1,100 photographs and drawings, it provides an essential text and material on bone pathology, thus helping improve the diagnostic ability of those interested in human dry bone pathology. Presents a comprehensive review of the skeletal diseases encountered in archaeological human remains Includes more than 1100 photographs and line drawings illustrating skeletal diseases, including both microscopic and gross features Based on extensive research on skeletal paleopathology in many countries Reviews important theoretical issues on how to interpret evidence of skeletal disease in archaeological human populations

Dual-energy CT is a novel, rapidly emerging imaging technique which offers important new functional and specific information. In this book, physicists and specialists from different CT manufacturers provide an insight into the technological basis of, and the different approaches to, dual-energy CT. Renowned medical scientists in the field explain the pathophysiological and molecular background of the technique, discuss its applications, provide detailed advice on how to obtain optimal results, and offer hints regarding clinical interpretation. The main focus is on the use of dual-energy CT in daily clinical practice, and individual sections are devoted to imaging of the vascular system, the thorax, the abdomen, and the extremities. Evaluations and recommendations are based on personal experience and peer-reviewed literature. Plenty of carefully chosen high-quality images are included to illustrate the clinical benefits of the technique.

Since its introduction in the 1970’s CT has emerged as a modality of choice because of its high sensitivity in producing accurate diagnostic images. A third of all Computed Tomography (CT) examinations are abdominal CTs which deliver one of the highest doses among common examinations. An increase in the number of CT examinations has raised concerns about the negative effects of ionising radiation as the dose is cumulative over the life span of the individual. Image quality in CT is closely related to the radiation dose, so that a certain dose with an associated small, but not negligible, risk is a prerequisite for high image quality. Typically, dose reduction in CT results in higher noise and a decrease in low contrast resolution which can be detrimental to the image quality produced. New technology presents a wide range of dose reduction strategies, the latest being iterative reconstruction (IR).The aim of this thesis was to evaluate two different classes of iterative reconstruction algorithms: statistical (SAFIRE) and model-based (ADMIRE) as well as to explore the diagnostic value of a low-dose abdominal CT for optimisation purposes. This thesis included a total of 140 human subjects in four image quality evaluation studies, three of which were prospective studies (Papers I, II and IV) and one retrospective study (Paper III). Visual grading experiments to determine the potential dose reductions, were performed with pairwise comparison of image quality in the same patient at different tube loads (dose) and reconstructed with Filtered back projection (FBP) and SAFIRE strength 1 in a low-dose abdominal CT (Paper I) and FBP and ADMIRE strengths 3 and 5 in a standard dose abdominal CT (Paper II). Paper IV evaluated the impact of slice thicknesses in CT images reconstructed with ADMIRE strengths 3 and 5 when comparing multiplanar reconstruction (MPR) formatted images in a standard dose abdominal CT. Paper III, on the other hand, was an absolute assessment of image quality and pathology between the three phases of a CT Urography (CTU) protocol to explore the diagnostic value of low-dose abdominal CT. The anonymised images were displayed in random order and image quality was assessed by a group of radiologists using image quality criteria from the “European guidelines of quality criteria for CT”. The responses from the reviewer assessment were analysed statistically with ordinal logistic regression i.e. Visual Grading Regression (VGR). Results in Paper I show that a small dose reduction (5-9 %) was possible using SAFIRE strength 1and indicated the need for further research to evaluate the dose reduction potential of higher strengths of the algorithm. In Paper II a 30% dose reduction was possible without change in ADMIRE algorithm strength as no improvement in image quality was observed between tube loads 98- and 140 mAs. When comparing tube loads 42 and 98 mAs, further dose reduction was possible with ADMIRE strength 3 (22-47%). However, for images reconstructed with ADMIRE strength 5, a dose reduction of 34-74% was possible for some, but not all image criteria. Image quality in low-contrast objects such as the liver parenchyma, was affected and a decline in diagnostic confidence was observed. Paper IV showed potential dose reductions are possible with increasing slice thickness from 1 mm to 2 mm (24-35%) and 1 mm to 3mm (25-41%). ADMIRE strength 3 continued to provide diagnostically acceptable images with possible dose reductions for all image criteria assessed. Despite objective evaluations showing a decrease in noise and an increase in contrast to noise ratio, ADMIRE strength 5 had diverse effects on the five image criteria, depending on slice thickness and further dose reductions were limited to certain image criteria. The findings do not support a general recommendation to replace ADMIRE3 with ADMIRE5 in clinical abdominal CT protocols. Paper III studied another aspect of optimisation and results show that visualisation of renal anatomy was as expected in favour of the post-contrast phases when compared to the native phase. Assessment of pathology showed no significant differences between the three phases. Significantly higher diagnostic certainty for renal anatomy was observed for the post-contrast phases when compared to the native phase. Significantly high certainty scores were also seen for the nephrographic phase for incidental findings. The conclusion is that a low-dose series seems to be sufficient as a first-line modality in certain patient groups. This thesis clinically evaluated the effect of IR in abdominal CT imaging and estimated potential dose reductions. The important conclusion from papers I, II and IV is that IR improves image quality in abdominal CT allowing for some dose reductions. However, the clinical utility of the highest

strength of the algorithm is limited to certain criteria. The results can be used to optimise the clinical abdominal CT protocol. The conclusion from paper III may increase clinical awareness of the value of the low-dose abdominal protocol when choosing an imaging method for certain patient groups who are more sensitive to radiation. Datortomografi (DT) används i allt större omfattning vid bilddiagnostik och ger en viss stråldos till patienten. DT är en viktig, snabb och patientvänlig undersökningsteknik. En fördel med denna teknik är att bildmaterialet kan rekonstrueras i olika format för att åskådliggöra anatomin på bästasätt beroende på vilken frågeställning som ska besvaras. Joniserande strålning från dessa undersökningar anses öka risken för negativa effekter även om risken för den enskilde patient är mycket liten. Antalet datortomografiundersökningar ökar från år till år vilket kan leda till ökade stråldoser tillbefolkningen. Optimering av undersökningsteknik och val av undersökning för att minska negativa effekter av röntgenstrålning är därför nödvändig. Det övergripande målet med avhandlingen var att utvärdera bildkvalitetvid en DT-undersökning av buken (då dessa medför en av de högstastråldoserna bland de vanliga röntgenundersökningarna), att kvantifieramöjlig stråldosminskning med hjälp av iterativa rekonstruktionsalgoritmer och att utvärdera diagnostiska värdet av lågdosundersökningsteknik vid DT-buk. Av de fyra delstudierna var delarbeten I, II och IV prospektiva och delarbete III retrospektivt. För de prospektiva studierna, samlades bildmaterial in vid en kliniskberättigad undersökning av lågdos-DT av buken (delarbetet I), eller standarddos-DT av buken (delarbetet II och IV). Bilder rekonstruerades meden standard bildrekonstruktionsalgoritm, filtrerad återprojektion (FBP), och med styrka 1 av den iterativa algoritmen SAFIRE (delarbetet I). I delarbeten II och IV, gjordes bildrekonstruktioner med FBP och med styrka 3 och 5 av den iterativa algoritmen ADMIRE. Avidentifierade bildmaterialför varje patient visades parvis i slumpmässig ordning för ett antal granskare och bildkvaliteten bedömdes med hjälp av europeiska bildkriterier. I den retrospektiva studien, delarbete III, hämtades bildmaterialet från utförda DT-urografiundersökningar från bildarkivet. För varje undersökning visades bilder från varje fas i DT-urografiundersökningen separat i slumpmässig ordning. För samtliga delarbeten, hämtades bildkriteriernafrån ”European Guidelines of Quality Criteria for CT” och modifierades för att passa till varje studie. Granskarnas bedömning analyserades med ordinal logistisk regression så kallad visual grading regression (VGR). Resultat från delarbetet I visade att det fanns en signifikant inverkan av dos (p

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