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4th
EDITION

Conceptual Review of

Radiology

(Text and Atlas)

Nothing beyond for NEXT/INI-CET & NBE

*As per the New Pattern Exams (NEXT) with many
Clinical Case-based Questions*

Papers Covered

INI CET - 2022 - 20

Recent Qs (Jan) 2022 - 2012

AIIMS June 2020 - 2010

Clinical Quiz Qs

CBME-Based Subjective Qs with
Chapter References

- Written and Compiled by Leading Faculties and Subject Experts of Radiology
- Enriched with Latest Updates up to 2022



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MCQs of
Recent Exams

100+
CBQs

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IBQs &
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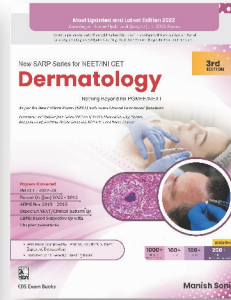
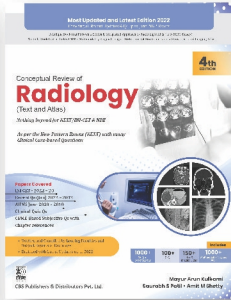
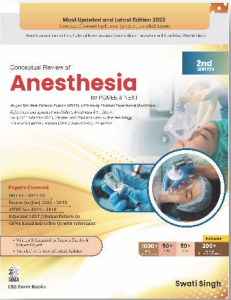
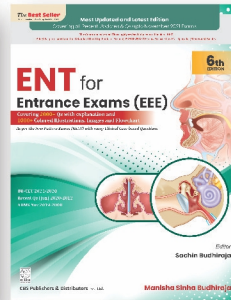
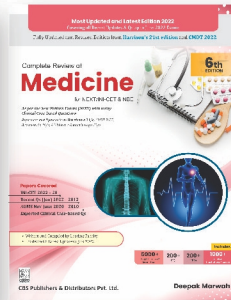
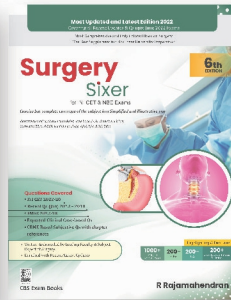
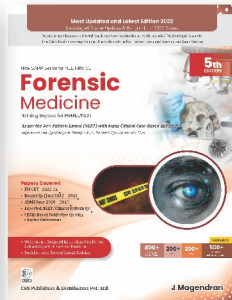
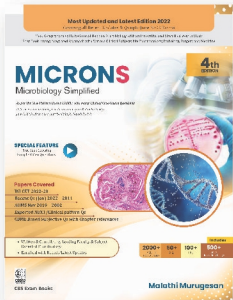
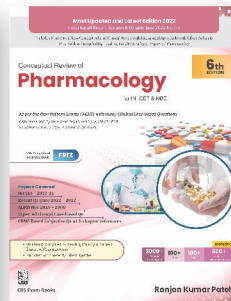
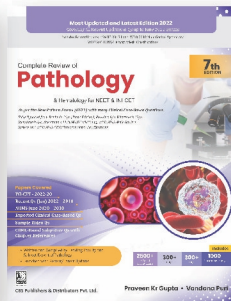
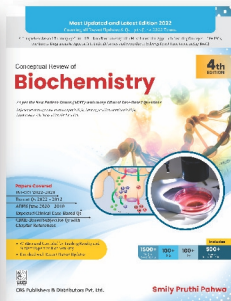
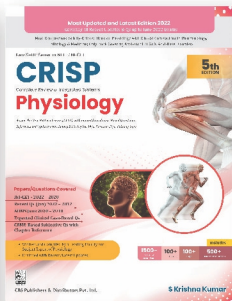
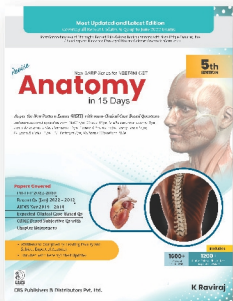
Mayur Arun Kulkarni
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Conceptual Review of

Radiology

(Text and Atlas)

Nothing beyond for NEXT/INI-CET & NBE

*As per the New Pattern Exams (NEXT) with many
Clinical Case-based Questions*



• **Fourth Edition** •

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DISCLAIMER

This book contains questions based on important topics frequently asked in previous years National Level PG Entrance Examinations & State Level Examinations in India. Often repeated topics and sub-topics have been included for students' benefit. We do not claim that these questions are exact or similar to questions asked in any recent examinations in India. If any such similarity is found, it is purely coincidental and by chance.

ISBN: 978-93-94525-09-2

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Fourth Edition: 2023

Third Edition: 2020

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Published by **Satish Kumar Jain** and produced by **Varun Jain** for

CBS Publishers & Distributors Pvt Ltd

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Preface

“Eyes do not see what the Mind does not know!”

We are never taught RADIOLOGY in the undergraduate curriculum, right? And our examiners assume (wrongfully so) that we know everything about all imaging modalities and confront us with X-ray, USG, CT, MRI, PET scan images in these exams... and the result is... well, unwarranted and extreme phobia of this subject! The primary intent of this book is to address this injustice meted out to students. When you read this book, this huge “GAP” between what you are taught and what is expected from you in your exams – WILL NOT EXIST. This is a promise.

IMAGES, the real hero of Radiology, are the assets of this book too. Hence, now you will find this 4th edition focusing more on Images—High quality and Large images—for your quick reference and revision.

What a journey it has been! In this era of Apps & Notes – a book faces an existential crisis today. But where a pessimist sees doom, an optimist notices glitter!

“What best can I do for my students?” I often ponder. In this rapidly changing scenario – the answer though is quite clear. It's the IMAGES my students really need today! They have the videos, also the notes. They have Q-banks too. What they do not have is relevant, clear, spotter images! Well, not any more. Here I present my dream to you. You will find ample, large sized spotter images in this book. The page design has been set such that Images occupy most of the page with minimal text around it. It is a perfect companion for exam preparing students (NEET/NEXT/FMGE). It is also a valuable tool for undergraduate students — a reference guide so to say for Images. Open it, experience it and enjoy it.

Every topic in this 4th edition begins with a recently asked “Clinical Quiz” question with its solution discussed at the end of that topic. Another new highlight of this new edition is high- yield “Clinical Insights” that will cover important topics in other subjects related to a particular diagnosis. In addition to these we have continued with our conceptual approach using the popular “Concept Boxes”, Mnemonics and an Image-Based Approach.

Let us do some Myth-busting about Radiology.

■ **Myth: Radiology is a Short Subject**

Look at the statistics:

	Radiology MCQs	Total MCQs
NEET - PG	12	300
FMGE	10	200

Thus statistically, 12/300 and 10/200 are in favor of Radiology being called a short subject. But this is not true. Just speak to your colleagues and seniors and they will let you know that subjects like Medicine, Surgery, OBG, Pediatrics, Orthopedics and ENT have image-based questions based on radiological investigations.... How can you leave them out? Thus the total number of radiology-related questions in your examinations is now at least 15–20 thus making it a major chunk of questions. Hence, we have made an attempt to make this book as comprehensive as possible with 1000+ original images, illustrations, concept boxes and tips-and-tricks for your preparation.

Fact: Radiology is a major subject and needs to be studied comprehensively considering the current examination pattern and trends.

■ **Myth: Radiology is a Factual Subject**

This is what most of us believe about this subject and hence we are afraid of it. We start dealing with these factual topics and the only way to combat them is to mug them up. This makes the subject very difficult to remember and ultimately daunting and intimidating.

Fact: Radiology is a Conceptual subject with most of the facts based on beautiful Core Concepts. Understanding these Core Concepts would help us remember all the factual topics quite easily.



Conceptual Review of Radiology (*Text and Atlas*)

This is the absolute truth! Believe it or not, almost all factual topics in Radiology are based on “Core Concepts”. The correct way to approach Radiology is to understand these concepts first and then practice them. In this way, Radiology will not only become easy to understand and remember but also fun to study!

A few examples of this unique way of learning Radiology include:

Factual Topic	Underlying Core Concept
• Silhouette Sign in Chest Radiology is Based on	• Differential Radiographic Density Theory
• Radiological Syndromes are Based on	• Law of Radiobiology
• Each Diagnostic Radionuclide Use is Based on	• Physiology of the Radionuclide
• Named Signs and Appearances in Radiology (at least 90% of them) are Based on	• Differential Radiographic Density Theory
• Investigation of Choice/Gold Standard Investigations is Based on	• Basic Understanding of Each Modality and its Physics

Although we speak and focus primarily on the PG Entrance examinations (NEET/NEXT/FMGE), remember that as Doctors we have an entire lifetime of medical practice ahead. This examination is just the first step toward that journey and we hope that even beyond this examination, the book will surely help you in your practice irrespective of the specialty you choose.

Mayur Arun Kulkarni
Saurabh S Patil
Amit M Shetty

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Acknowledgments

“To Improve is to Change, to be Perfect is to Change Often – Winston Churchill”

This book is dedicated to the two little angels in my life Spruha and Hrida. With the completion of the book, I now pledge to spend more time with them and indulge in the little pleasures of parenting. My dear wife Dr. Kavita is my pillar of support. It is impossible being supportive of a husband, who is in work-mode 24 × 7, for 365 days. I wonder how she manages to do it and also excels in her career and parenting alike. Thank you for being a solid lighthouse and making me realize the real priorities in life. I can teach and write and work tirelessly only because she covers up for me on all fronts! My parents have been a constant source of inspiration in my life. Thank you both Aai-Baba for being so supportive. Shardul-Sharmila, Amey-Savita also deserve a special mention for their unconditional support throughout my career. My co-authors Dr Saurabh and Dr Amit – my dear friends as well – are indeed the pillars of this project. Dr Basavraj Biradar has also helped me selflessly in this endeavour. Dr Swapnil Yewalkar, my dear friend and partner at Shree Diagnostics has also supported me throughout this endeavor. I wish my dear friend Dr. Pooja was with me to see this book! May God bless her wherever she is. I thank my colleagues at Marrow & NLC for the wonderful opportunities and love with special mention to Dr Deepu Sebin, Dr Shujad, Dr Rohan Khandelwal, Dr Ashish, Dr Paras, Dr Sara and Dr Aman Setiya.

Mayur Arun Kulkarni

It is a great pleasure to present this 4th edition after the success of previous editions of Conceptual Review of Radiology. The number of Radiology-related questions asked in recent NEET exams and success of students who referred to CRR speaks for itself. The effort we took in shaping this edition based on your inputs, was no mean task either. Lastly, it is the interest and affection shown by PG aspirants that kept us motivated in finishing the book well within time. My best wishes to all students for their future.

Saurabh S Patil

My dear wife Dr Anusha Shetty was always there for support in this super-busy time. My family, mom-dad and my brother Manish have supported me unconditionally throughout this endeavor. I must mention my dear friend Dr Pooja Deshpande – for being a close and special confidante – in testing times.

Amit M Shetty

We extend our special thanks to **Mr Satish Kumar Jain** (Chairman) and **Mr Varun Jain** (Managing Director), M/s CBS Publishers and Distributors Pvt Ltd for their wholehearted support in publication of this book. We have no words to describe the role, efforts, inputs and initiatives undertaken by **Mr Bhupesh Aarora** [Sr. Vice President – Publishing & Marketing (Health Sciences Division)] for helping and motivating us.

Last but not least, we sincerely thank the entire CBS team for bringing out the book with utmost care and attractive presentation. We would like to thank Ms Nitasha Arora (Publishing Head and Content Strategist – PGME&N and Nursing), and Dr Anju Dhir (Product Manager cum Commissioning Editor – Medical) for their editorial support. We would also extend our thanks to Mr Shivendu Bhushan Pandey (Sr. Manager and Team Lead), Mr Ashutosh Pathak (Sr. Proofreader cum Team Coordinator) and all the production team members for devoting laborious hours in designing and typesetting the book.

We would like to acknowledge our ultimate source of inspiration – our Students. It is for them that we can endure all the hectic travellings, the nonstop extensive hours of teaching, the sleep deprivation and all the sacrifices of personal life – so that they get what they deserve in their lives.

This book is for you. Let's rock Radiology – together!



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Contents

Radiology – though a distinct specialty now – is indeed inseparable from the clinical sciences. Hence, we have taken some extra effort and designed this book in a particular manner; grouping together related conditions in a logical order. This topic-wise table of contents will not only help you cruise through this book when you study Radiology, but also when you study your other clinical subjects. Keep this book handy when you study Medicine, Surgery, Pediatrics and OBG and easily find a specific condition in this table – complete your preparation of any topic by going through its imaging findings then-and-there. Welcome to what we call the – *Integrated learning experience!*

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CBME-Based Subjective Questions with Chapter/Pages References*

Competencies	Competency: The student should be able to	For Answer Refer
RADIODIAGNOSIS		
Topic: Radiological Investigations and Radiation Safety		
RD1.1	Define radiation and the interaction of radiation and importance of radiation protection	Page 50–60
RD1.2	Describe the evolution of Radiodiagnosis. Identify various radiological equipments In the current era	Page 51–87
RD1.3	Enumerate indications for various common radiological investigations, choose the most appropriate and cost effective method and interpret findings in common conditions pertaining to disorder of ENT	Page 117
RD1.4	Enumerate indications for various common radiological investigations, choose the most appropriate and cost effective method and interpret findings in common conditions pertaining to disorder in Ob & Gy	Pages 331–350
RD1.5	Enumerate indications for various common radiological investigations, choose the most appropriate and cost effective method and interpret findings in common conditions pertaining to disorder in internal medicine	Pages 102–134
RD1.6	Enumerate indications for various common radiological investigations, choose the most appropriate and cost effective method and interpret findings in common conditions pertaining to disorders in surgery	Pages 167–229
RD1.7	Enumerate indications for various common radiological investigations, choose the most appropriate and cost effective method and interpret findings in common conditions pertaining to disorder in Pediatrics	Pages 151–156
RD1.8	Enumerate indications for various common radiological investigations, choose the most appropriate and cost effective method and interpret findings in common conditions pertaining to common malignancies	Pages 352–356
RD1.9	Describe the role of Interventional Radiology in common clinical conditions	Pages 159–160
RD1.10	Describe the role of Emergency Radiology, miscellaneous & applied aspects, interaction with clinical departments	Pages 167–188
RD1.11	Describe preparation of patient for common imaging procedures	–
RD1.12	Describe the effects of radiation in pregnancy and the methods of prevention/minimization of radiation exposure	Pages 61–62
RD1.13	Describe the components of the PC & PNDT Act and its medicolegal implications	–

*Important competency-based topics covered

Contd...



Conceptual Review of Radiology (*Text and Atlas*)

Competencies	Competency: The student should be able to	For Answer Refer
RADIOTHERAPY		
Topic: Principles of Radiation Oncology (Radiotherapy)		
RT1.1	Describe and discuss definition of radiation, mechanism of action of radiation, types of radiation	Page 363
RT1.2	Describe and discuss interaction of radiation with matter & measurement of radiation	Page 54–56
RT1.3	Enumerate, describe and discuss classification and staging of cancer (AJCC, FIGO etc.)	–
Topic: Radiation Protection		
RT2.1	Describe and discuss radiation protection and personnel monitoring during radiation treatment	Page 60
Topic: Radiobiology and Chemoradiation		
RT3.1	Describe and discuss cell cycle and cell survival curve, principles of Radiobiology	Page 366
RT3.2	Describe and discuss synergism of radiation and chemotherapy	–
Topic: Radiation Treatment Delivery and Outcome		
RT4.1	Describe and discuss teletherapy machine (Co60/LINAC)	Page 367
RT4.2	Enumerate, describe and discuss types of treatment plan, basic workflow of 2D/3DCRT/IMRT/IGRT	Page 369
RT4.3	Describe and discuss Brachytherapy machine (remote after loading)	Page 368
RT4.4	Describe and discuss different radioactive isotopes and their use in cancer patients	Page 364
RT4.5	Describe and discuss role of radiation in management of common malignancies in India (region specific)	Page 374
RT4.6	Describe and discuss radiotherapy for benign disease	–
RT4.7	Counsel patients regarding acute and late effects of radiation and supportive care	Page 58
RT4.8	Describe oncological emergencies and palliative care	Page 371
RT4.9	Display empathy in the care of patients with cancer	–
Topic: Cancer Prevention and Registries		
RT5.1	Describe and discuss cancer prevention, screening, vaccination, cancer registry	–

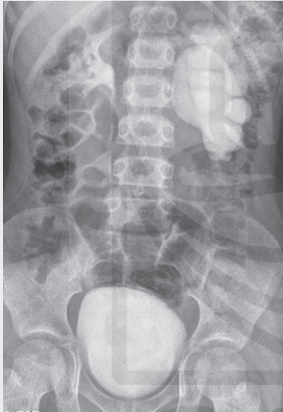


3. Baby presented with pain in the abdomen and mass felt. Based on the image shown here, what is the likely diagnosis? (NEET PG 2022 Pattern)

- A. Intussusception
- B. Volvulus
- C. Duodenal atresia
- D. Intestinal obstruction

3. Ans. (A) Intussusception

The barium enema shows a typical Claw sign – suggestive of Intussusception. This sign is seen on a barium enema study when the contrast in the intussusciptions outlines the intussusceptum and creates a claw-like shape. A coiled spring appearance may also be seen.



4. A patient presents with pain in abdomen. A delayed phase IVH image is shown here. What is the likely diagnosis? (NEET PG 2022 Pattern)

- A. Staghorn
- B. Renal cyst
- C. Putty kidney
- D. PUJ obstruction

4. Ans. (D) PUJ obstruction

The IVU image shows a markedly dilated/balloon left renal pelvis with an abrupt cut-off at the left pelviureteric junction. The left ureter is not visualized. Also, the calyces of the left kidney are dilated – suggest hydronephrosis. These findings are suggestive of a Pelviureteric junction obstruction.



5. A 30-year-old patient presents with progressive difficulty in swallowing more for liquids than solids for 8 months. A barium swallow was done and is shown in the image here. What other investigations should be done to confirm the diagnosis in this patient? (INI-CET May 2022 Pattern)

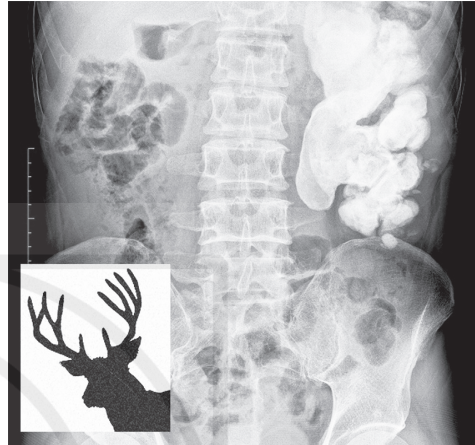
- A. UGIE + Manometry
- B. UGIE + CECT
- C. UGIE + PET
- D. UGIE + 24-hour pH monitoring



GU TRACT IMAGING



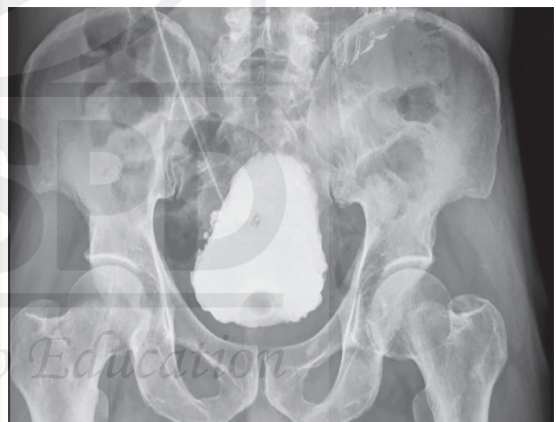
27. Cobra Head Sign/Adder Head Sign^Q (Recent Pattern Jan 2019)
 Seen on intravenous pyelogram (IVP) in Ureterocele^Q – the dilated ureter at level of vesicoureteric junction (VUJ) protrudes into the bladder and is outlined like a cobra head. Similar appearance can be identified on ultrasonography (USG).



29. Staghorn Calculus
 Large radiopaque shadow resembling horns of a stag seen on kidney, ureter, and bladder (KUB) radiograph. This appearance is seen in the struvite stones which originate in the renal pelvis and gradually extend into two or more calyces. These patients typically have history of recurrent urinary tract infection (UTI).



28. Keyhole Sign
 Seen on oblique Micturating cystourethrography film where there is dilated posterior urethra (black arrow) as a result of a slit-like Posterior urethral valve^Q (white arrow). PU valves when seen on antenatal ultrasound have a spinning top appearance^Q. It is most common cause of bladder outlet obstruction in neonates^Q and exclusively seen in males^Q.



30. Pine Cone Bladder/Fir Tree/Christmas Tree Bladder
 Appearance on IVU seen in Neurogenic bladder^Q where the inverted triangular-shaped bladder with the multiple small diverticula resembles a fir tree with its leaves.



X-rays



CLINICAL QUIZ

1. Laurel and Hardy were brought in for a Chest radiograph. The technician did Laurel's radiograph using exposure factors as 80 kV and 6 mAs. Considering Hardy's body habitus which of the following would be the most appropriate change in exposure factors that is required to be done?
- A. Decrease kV, Decrease mAs
 - B. Increase kV, Increase mAs
 - C. Decrease kV, Increase mAs
 - D. Increase kV, Decrease mAs



X-RAY BASICS

Radiation Symbols

**INTERNATIONAL RADIATION SYMBOL
"THE TREFOIL"**



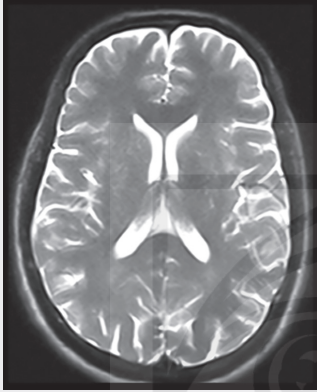
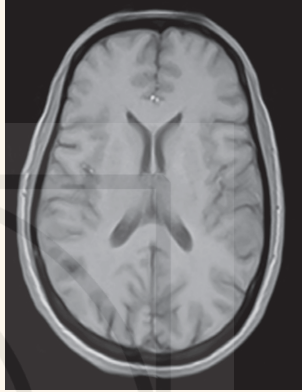
**HIGH LEVEL SEALED SOURCE IONIZING
RADIATION SYMBOL
IAEA & ISO - 2007**





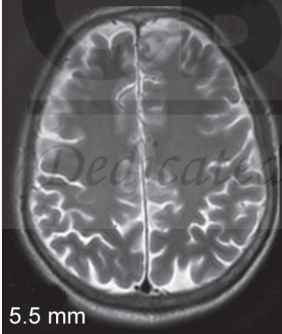
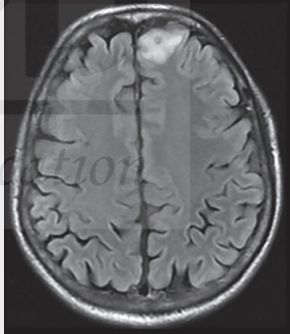
Clinical Insights

The T2 FLAIR Sequence

T2 Weighted (T2W)	T2 Fluid Attenuated Inversion Recovery ² (FLAIR) ²
	
CSF/Water: Hyperintense	CSF/Water: Hypointense—FLUID signal is attenuated ² —hence the name!
Gray-White matter appearance (Opposite to their names) <ul style="list-style-type: none"> • Gray matter—is hyperintense • White matter—is hypointense 	Gray-White matter appearance (Opposite to their names) <ul style="list-style-type: none"> • Gray matter—is hyperintense • White matter—is hypointense
Better for depiction of pathology	Can detect even the smallest of lesions

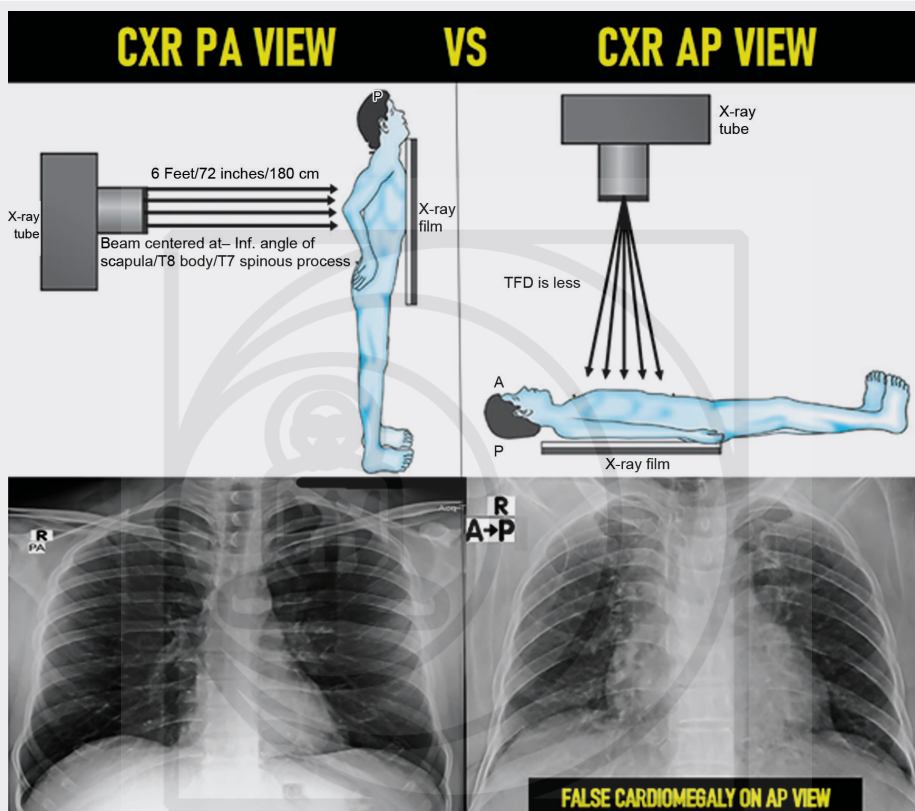
Why is T2-FLAIR needed?

Almost all abnormalities in the brain appear bright on T2W images. But CSF also appears bright on T2W images. This bright background (of CSF) makes the bright spot in the brain (the actual abnormality) very inconspicuous. But in FLAIR the CSF signal intensity is deliberately suppressed. So now against a dark background of CSF (because it is FLAIR) the abnormality in the brain is very well appreciated. Look at the following example:

	T2W	FLAIR
		
Lesion	Hyperintense (look at the left frontal region)	Hyperintense
CSF Background	Hyperintense	Hypointense
Lesion prominence	Not good	Very good. FLAIR increases the conspicuity of the lesion (like movie screen in a dark theatre hall!!)



CHEST RADIOGRAPH PROJECTIONS/VIEWS



Lateral Decubitus view

- Best X-ray projection for detection of minimal pleural effusion^Q

Lordotic View/ Apicogram

- Demonstration of lung apices^Q – as it minimized overlap from clavicles/Pancoast tumor^Q – Also termed as an APICOGRAM^Q
- Better for middle lobe pathologies^Q (RML and Lingular segment)/Interlobar pleural effusions^Q

Lordotic Grid technique

For evaluation of dense parenchymal lesions^Q/calcified lesions/bone lesions

Paired Inspiratory and Expiratory views

- Diaphragmatic movement in palsy
- Foreign body aspiration
- Air trapping

Right posterior Oblique

Left back of patient close to the cassette.

- Right side rib fractures/lesions
- Shows the maximum area of right lung field

Left posterior Oblique

Cassette close to the right back of patient

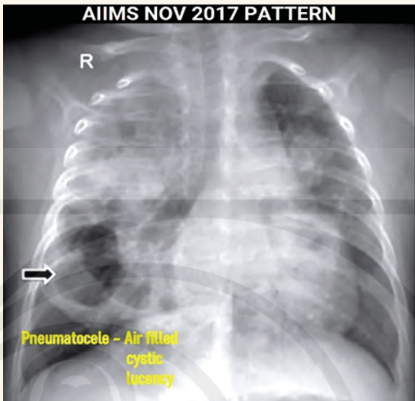
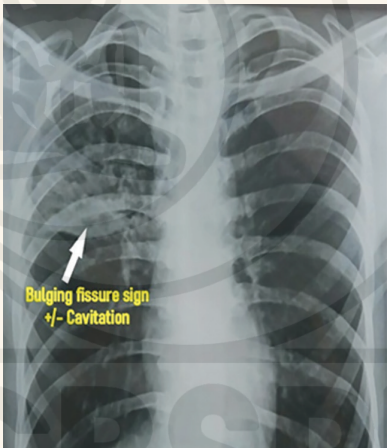

- Left side rib fractures/lesions
- Left Posterior Obliques (LPO) shows the left lung field

Contd...



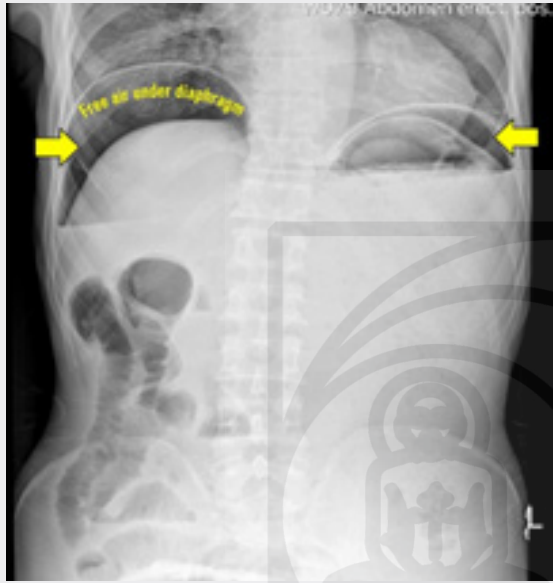
Clinical integrated approach to respiratory tract infections

Let's integrate the Clinical + Radiological aspects of various Infections and have some fun!!

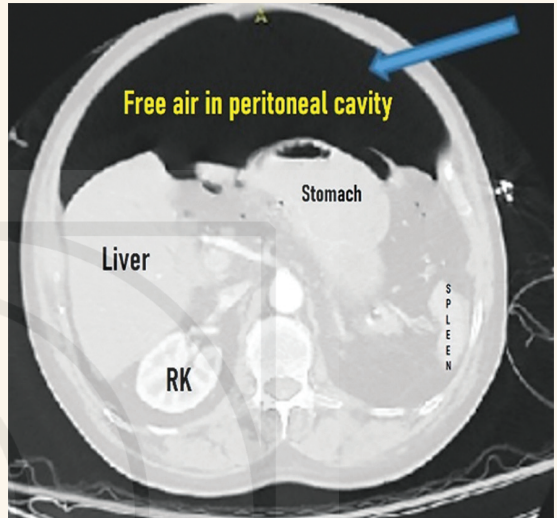
Clinical History	Imaging Findings	Diagnosis
<ul style="list-style-type: none"> • 12 yr Male • Fever + Cough with expectoration • On Rx with Antibiotics 	<p>AIIMS NOV 2017 PATTERN</p> 	<p>Staphylococcal pneumonia^Q</p>
<ul style="list-style-type: none"> • Chronic alcoholic/ Debilitated patient • Fever + Cough with expectoration + Breathlessness 		<p>Klebsiella pneumonia^Q</p>
<ul style="list-style-type: none"> • Low grade fever, dry cough • More constitutional symptoms – Headache, Myalgia 		<p>Atypical/Mycoplasma pneumonia^Q</p>



PNEUMOPERITONEUM



An X-ray Abdomen erect showing lucency under both domes of diaphragm—suggestive of Pneumoperitoneum/ Perforative peritonitis



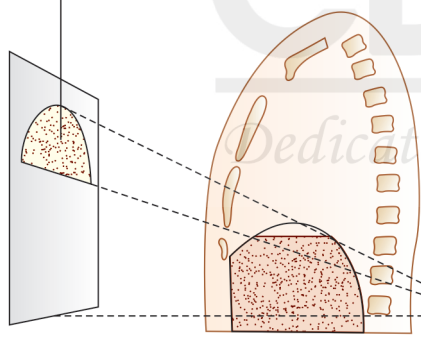
A CT Abdomen – Lung window image – showing large amount of free extraperitoneal air – suggestive of Pneumoperitoneum

Pneumoperitoneum Clinchers

- Most common cause in Adults – Bowel perforation^Q
- MC cause in Neonates – Necrotizing enterocolitis^Q
- Best X-ray projection – X-ray Chest erect^Q
- IOC overall – CT Abdomen^Q

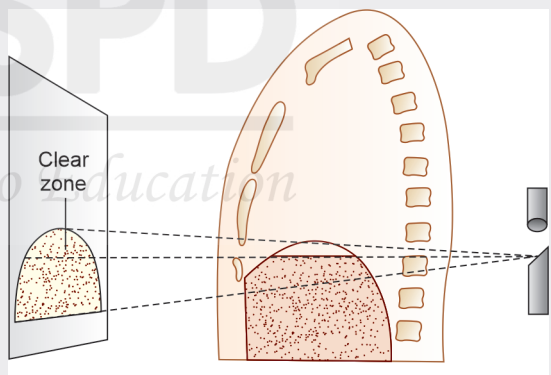
Erect Abdomen X-ray

Homogeneous opacity



Tube position too low
Pneumoperitoneum not seen

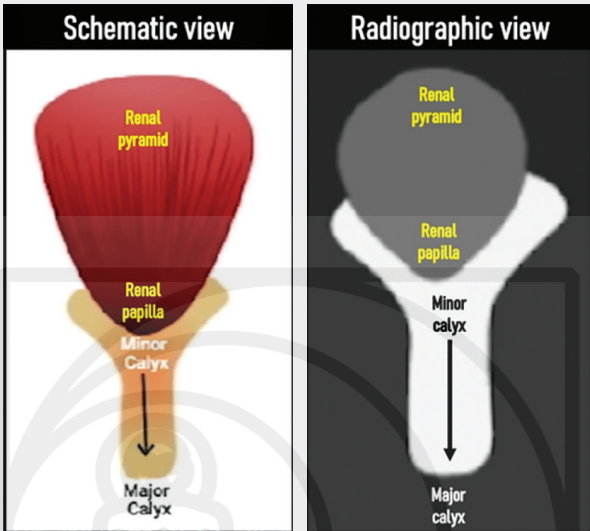
Erect Chest X-ray



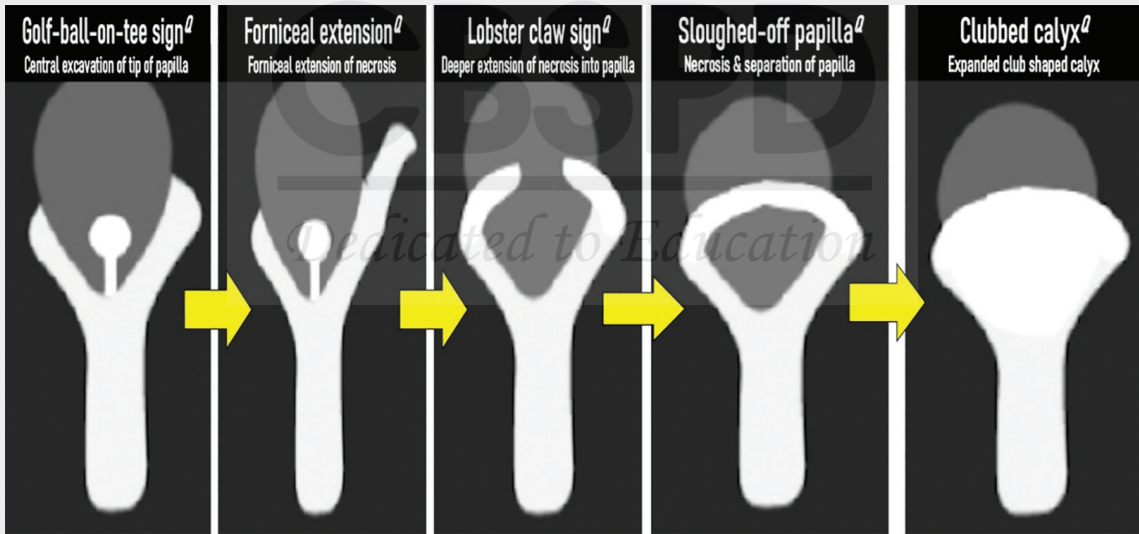
Tube in good position
Pneumoperitoneum well shown



Renal Papillary Necrosis



- Renal papilla is the tip of the renal pyramid. It is naturally prone to ischemic necrosis.
- Causes of papillary necrosis
 - P-Pyelonephritis
 - O-Obstruction
 - S-Sickle cell disease
 - T-TB
 - C-Cirrhosis
 - A-Analgesic abuse
 - R-Renal vein thrombosis
 - D-Diabetes mellitus
 - S-Systemic vasculitis



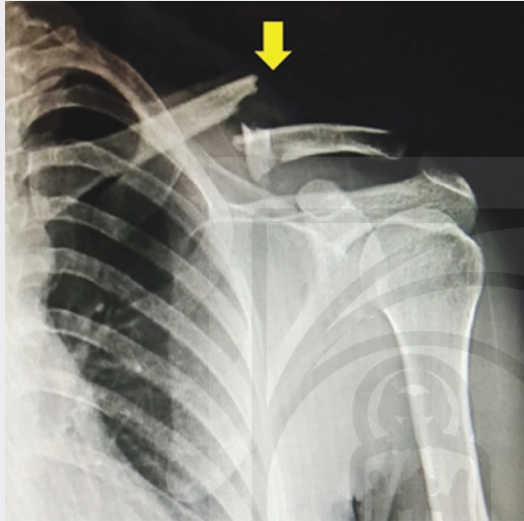
Renal Abnormalities and Miscellaneous

Contd...



Shoulder and Upper Limb Injuries

Clavicle Fracture

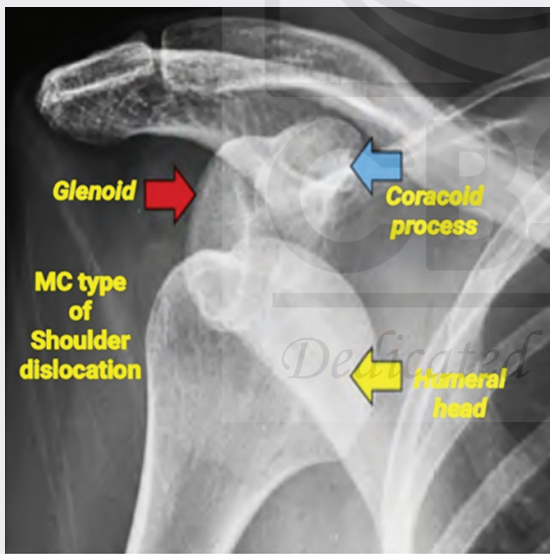


Altman classification used

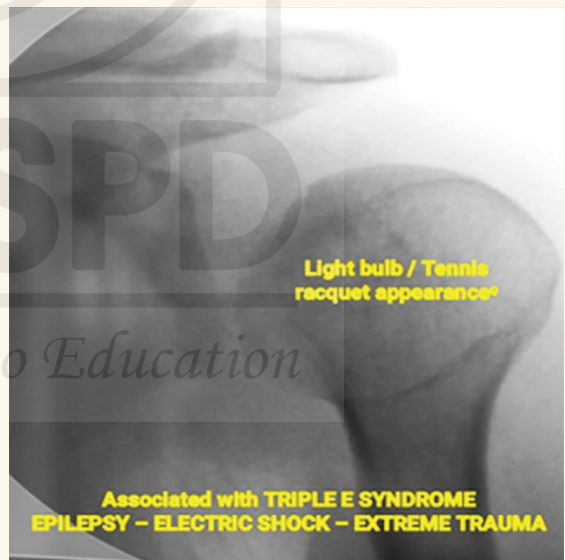
Acromioclavicular Joint Dislocation



Anterior/Subcoracoid Shoulder Dislocation

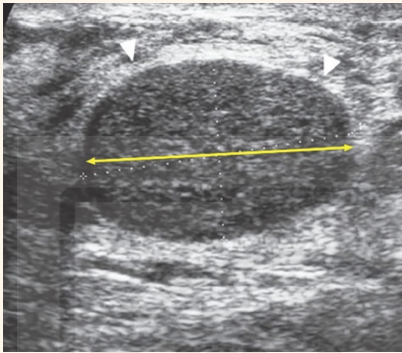
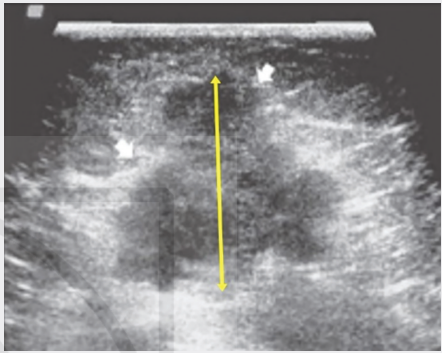
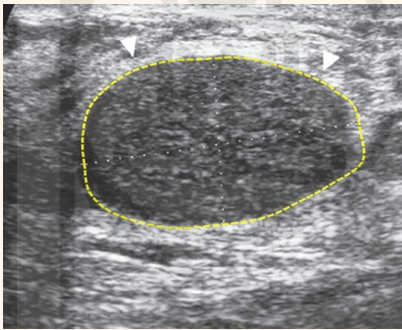
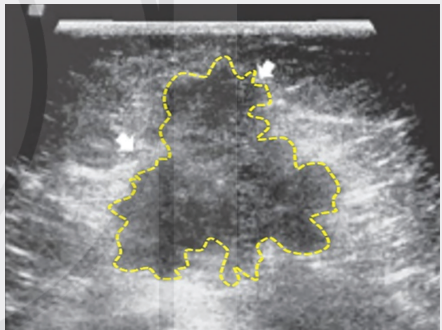
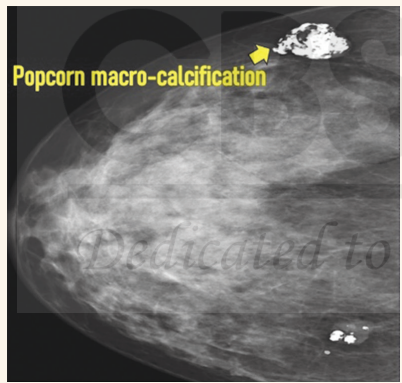
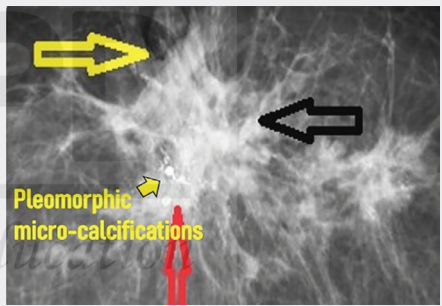


Posterior Shoulder Dislocation (Fluoroscopic Spot Film)





BENIGN VS MALIGNANT LESIONS ON MAMMOGRAPHY

Feature	Benign Lesions	Malignant Lesions
Shape	 <p style="text-align: center;">Oval – Wider than Taller</p>	 <p style="text-align: center;">Irregular – Taller than wider</p>
Margins	 <p style="text-align: center;">Smooth, No lobulations/spiculations</p>	 <p style="text-align: center;">Irregular with lobulations and spiculations</p>
Calcifications	 <p style="text-align: center;">Macrocalcifications Typical Popcorn calcifications are seen in Involuting fibro-adenoma</p>	 <p style="text-align: center;">Pleomorphic microcalcifications</p>
Architectural distortion	Absent	Present
Echogenic halo	Absent	Present

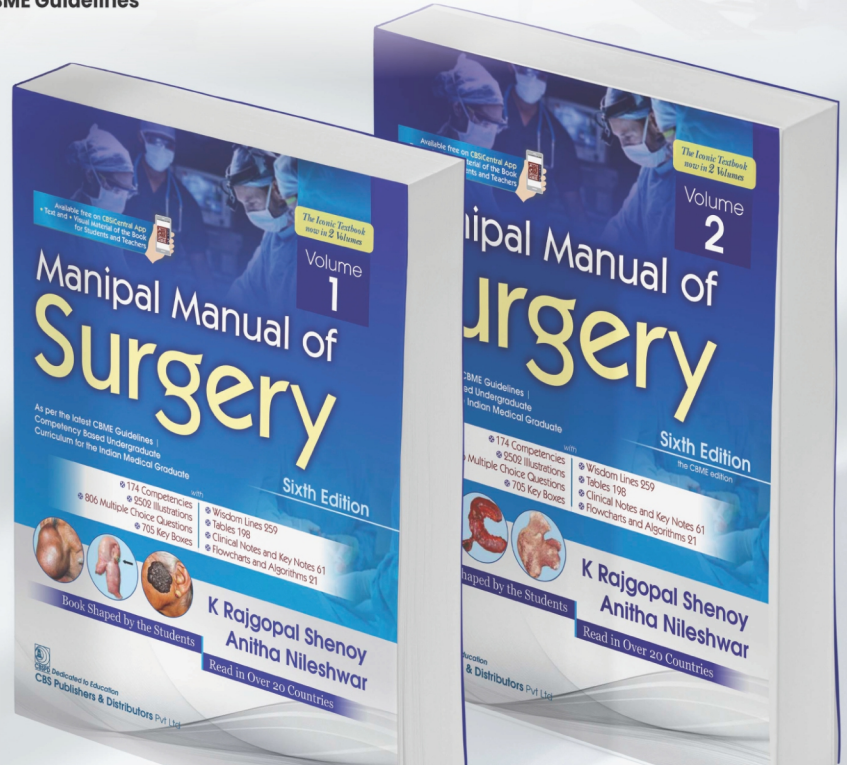


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Mayur Arun Kulkarni (MD, DNB Radiodiagnosis) or Dr MAK as he is fondly called by his students, is currently the Director of Shree Diagnostics, Pune, Maharashtra. Dr MAK is a popular name on the PG Entrance teaching landscape. His lectures on Marrow-Edition 6 are blockbusters today. He is the pioneer of RAD-IMAGINE Animations – Using for the first time Interactive and Original Animations in his lectures that make students fall in love with his teaching. His Interpretation Modules for CXR/USG/CT/MRI are also extremely popular. He completed his MD Radiodiagnosis from the prestigious B J Govt. Medical College, Pune and then DNB Radiology from Maulana Azad Medical College (MAMC), Delhi. He is known across the Indian cities for his concept-oriented and enthralling Radiology sessions. While teaching for more than 10 years, he has touched the lives of almost 25,000 students, introducing them to the world of Radiology and helping them not just for the entrance examinations, but also for the entire life of clinical practice ahead. Students, particularly remember him for his SMART-WORK Strategies—Mnemonic Secret, Harrison Dilemma, Volatility Conundrum and many such novel tips & tricks. Apart from his tenure as an Assistant Professor at B J Medical College, Pune, he has undergone specialized training in Neurovascular Ultrasound at Cerebrovascular and Vasculitis Research Foundation, Chennai, Tamil Nadu, and has contributed several research papers and review articles to the Journals of National and International repute. The author has also been involved in compilation of several textbooks for PG aspirants and creation of grand tests and subject wise tests for PG aspirants for the past 10 years.

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Students' Reviews

Bipasha Kumar

School of Medical Sciences and Research, Sharda University
Greater Noida, Uttar Pradesh

I loved the image-based questions. Radiology is all about learning from images and real-life scenarios. In the pandemic situation, when we weren't exposed to clinical scenarios, image-based questions really helped.



Prasanth R.

Stanley Medical College, Chennai

This book is known for conceptual way of explaining the topics. This book makes fact-based topic easy to read in a conceptual way. The approach of the author and technique of explaining every topic both are quite impressive.



Niki

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Amazon Customer

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Ratish

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Dr Ankur Saikia

Great book, a must study book for PG exam. Topics explained in detailed manner, timely delivered. Nicely packed.



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ISBN: 978-93-94525-09-2



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