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ENVIRONMENT AND HEALTH: RADIOLOGIST'S PERSPECTIVE

Dr. DEEP N SRIVASTAVA MD, MBA, FAMS, FICR
PROFESSOR
DEPARTMENT OF RADIODIAGNOSIS
AIIMS, NEW DELHI

ENVIRONMENTAL vs POLLUTION DISEASES

ENVIRONMENTAL DISEASES (Direct result of environment)

- Exposure to toxic chemicals
- Substance abuse
- Physical factors (UV radiation)
- Genetic predisposition

POLLUTION DISEASES (Exposure to toxins)

- Exposure to toxins in air, water & soil

- So all pollution related diseases are Environmental diseases, but
- Not all Environmental diseases are Pollution related diseases.

Commissions from the Lancet journals View all Commissions

The Lancet Commission on pollution and health

Published: October 19, 2017

Executive Summary

For decades, pollution and its harmful effects on people's health, the environment, and the planet have been neglected both by Governments and the international development agenda. Yet, pollution is the largest environmental cause of disease and death in the world today, responsible for an estimated 9 million premature deaths.

The Lancet Commission on pollution and health addresses the full health and economic costs of air, water, and soil pollution. Through analyses of existing and emerging data, the Commission reveals pollution's severe and underreported contribution to the Global Burden of Disease. It uncovers the economic costs of pollution to low-income and middle-income countries. The Commission will inform key decision makers around the world about the burden that pollution places on health and economic development, and about available cost-effective pollution control solutions and strategies.

Infographic

View the infographic on the Commission. Used with permission from the Mount Sinai Health System.

In 2015, diseases caused by pollution were responsible for

9 million premature deaths.
That is 16 percent of all global deaths.

3 x

15 x

Exposures to contaminated air, water and soil kill more people than a high-sodium diet, obesity, alcohol, road accidents, or child and maternal malnutrition. They are also responsible for three times as many deaths as AIDS, tuberculosis, and malaria combined, and for nearly 15 times as many deaths as war and all forms of violence.

Air pollution and climate change are closely linked and share common solutions.
Fossil fuel combustion in higher-income countries and the burning of biomass in lower-income countries accounts for 85 percent of airborne particulate pollution.

Major emitters of carbon dioxide are coal-fired power plants, chemical producers, mining operations, and vehicles. Accelerating the switch to cleaner sources of energy will reduce air pollution and improve human and planetary health.

The cost of inaction is high, while solutions yield enormous economic gains.

Welfare losses due to pollution are estimated at **$4.6 trillion per year — 6.2 percent of global economic output.** In the United States, investment in pollution control has returned $200 billion each year since 1980 ($6 trillion total). The claim that pollution control stifles economic growth and that poor countries must pollute to grow is false.

Pollution is neglected by funding agencies worldwide.

We can all help to make a difference.

Governments can integrate pollution challenges and control strategies into planning processes. Ask for support from development assistance agencies. Design and implement programs that reduce pollution, and save lives. End government subsidies and tax breaks for polluting industries.

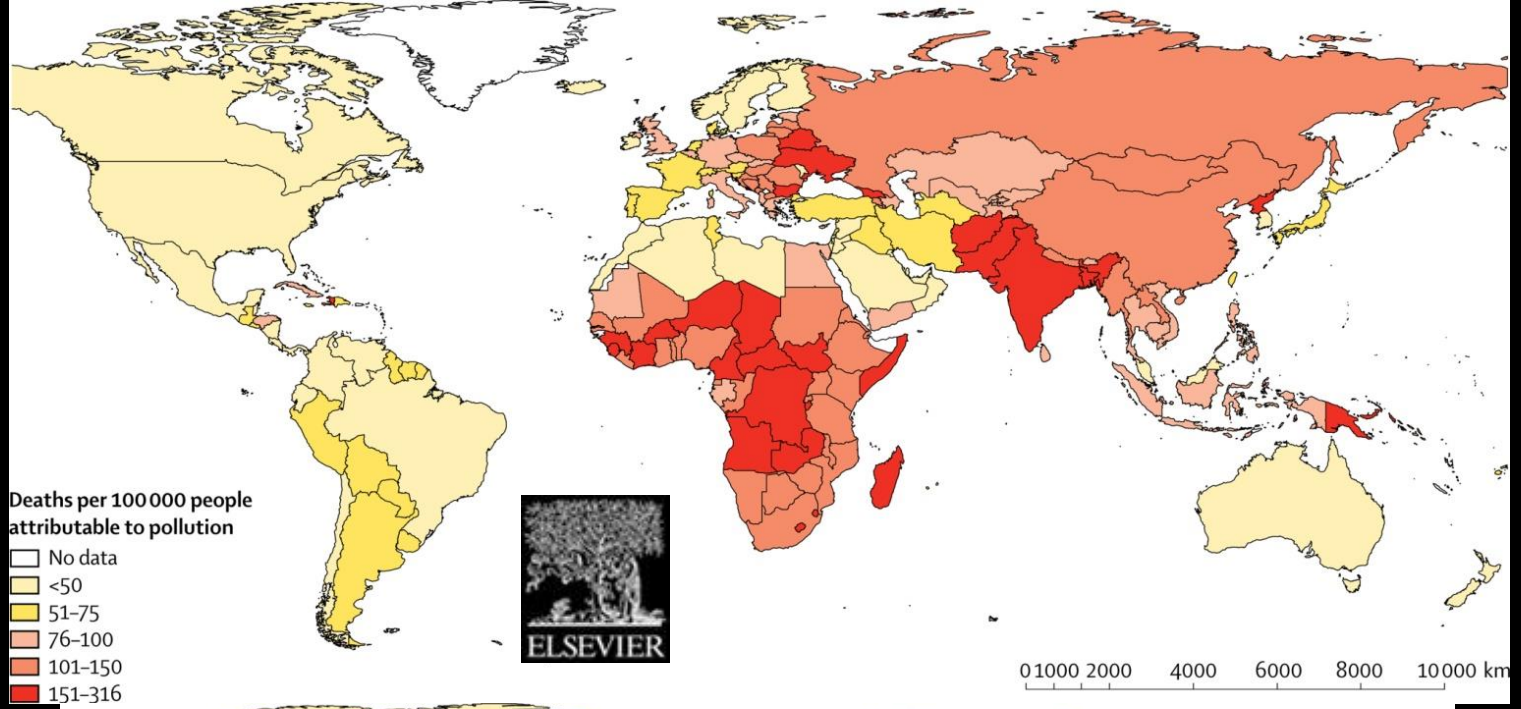
International donors, foundations, health professionals, and individuals should prioritize funding for pollution planning, interventions, and research.

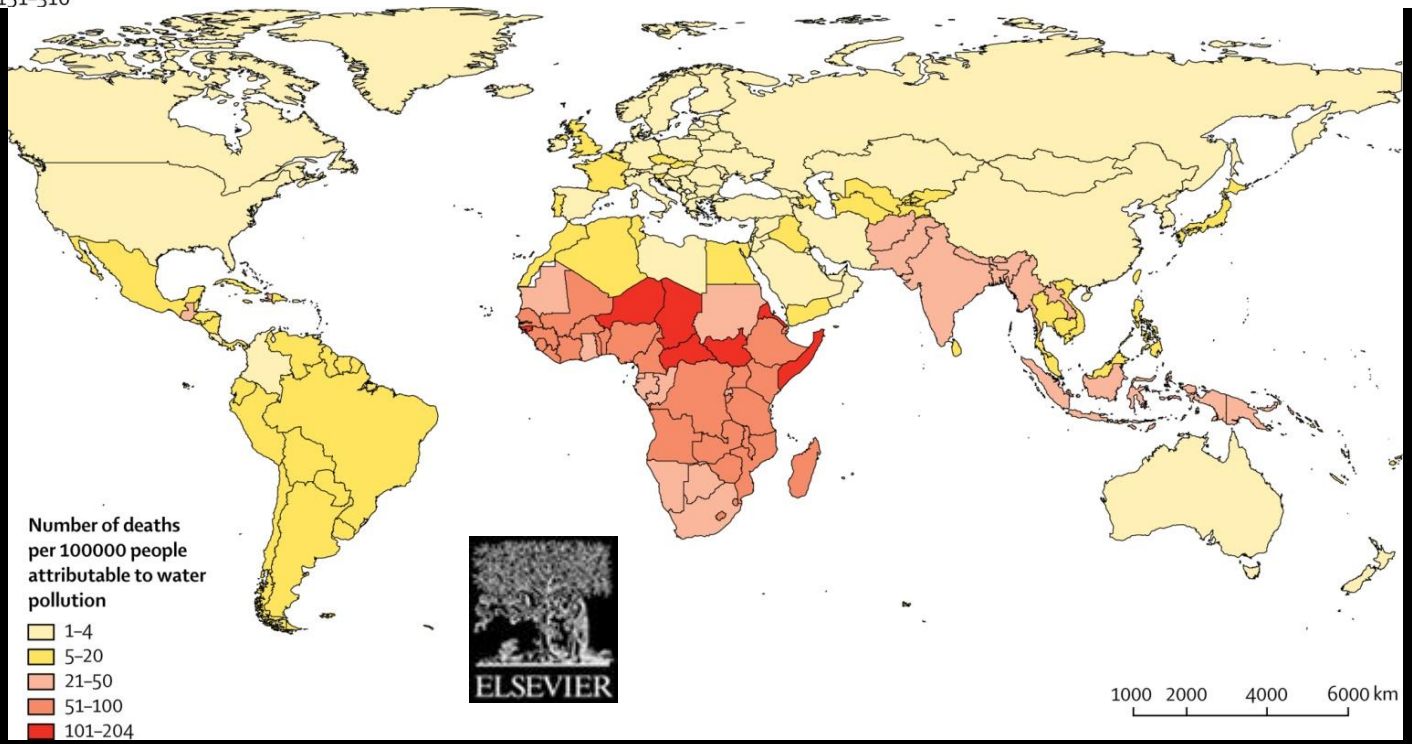
People affected by pollution can review data related to toxic exposures in their neighborhood and connect with help by visiting **www.pollution.org**

Icahn School of Medicine at Mount Sinai

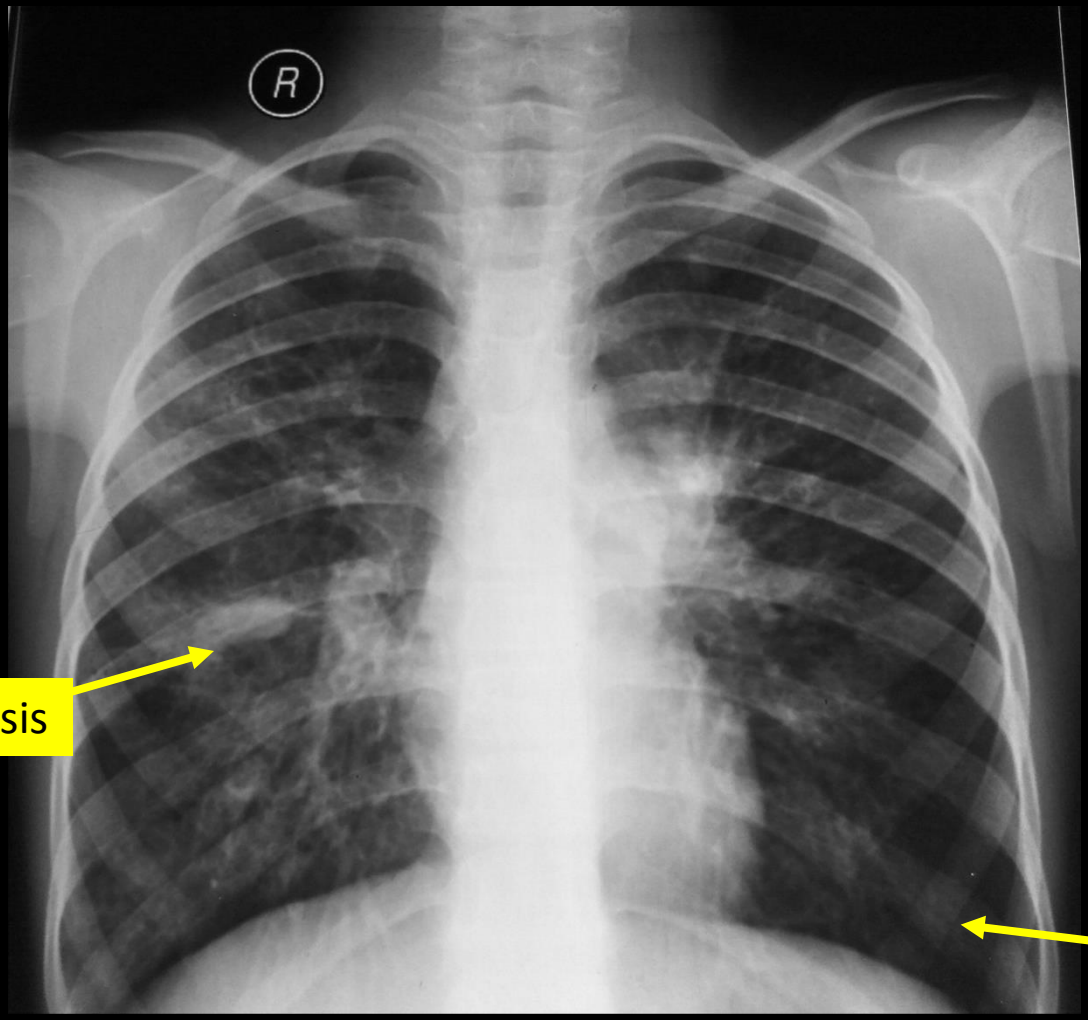
THE LANCET

GAHP GLOBAL ALLIANCE ON HEALTH AND POLLUTION


Deaths per 100 000 people attributable to pollution
No data
<50
51–75
76–100
101–150
151–316
ELSEVIER
0 1000 2000 4000 6000 8000 10 000 km


Number of deaths per 100000 people attributable to water pollution
1–4
5–20
21–50
51–100
101–204
ELSEVIER
1000 2000 4000 6000 km

COMMON DISEASES CAUSED BY CHANGES IN ENVIRONMENT (AIR POLLUTION)

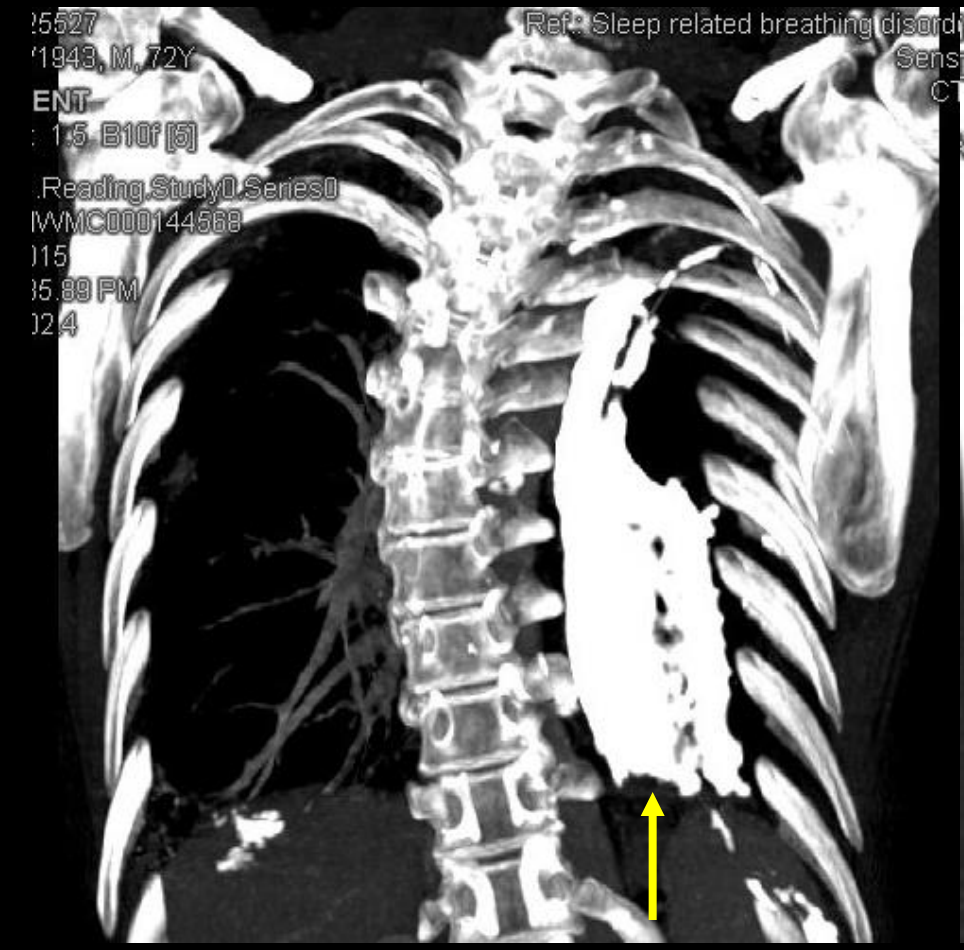


Lung atelectasis

Air trapping

Poor air quality can precipitate or worsen asthma and chronic breathing problems

COMMON DISEASES CAUSED BY CHANGES IN ENVIRONMENT (AIR POLLUTION)

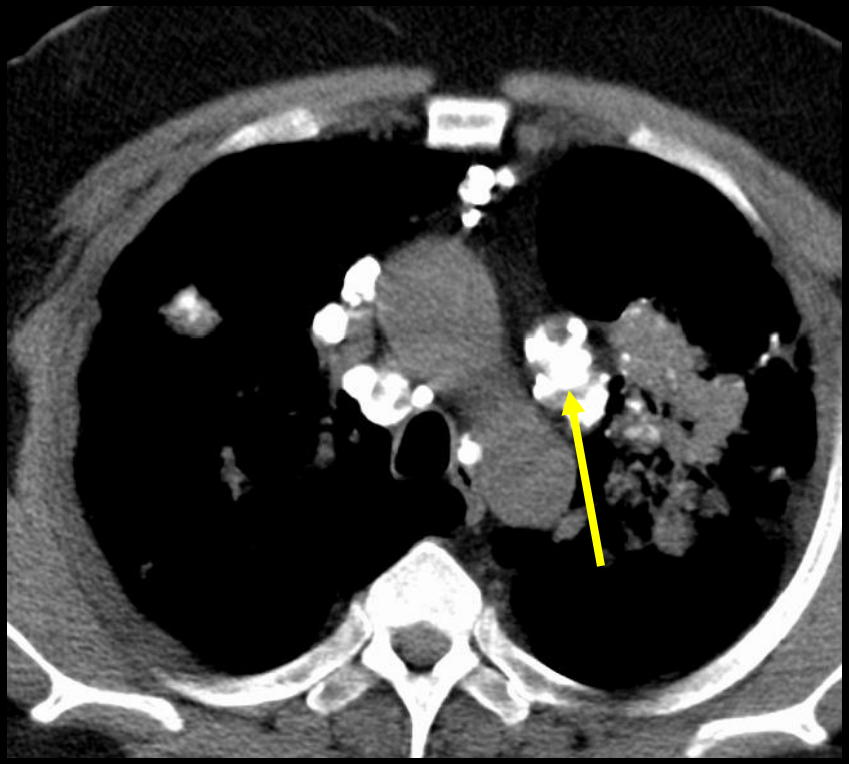


Pleural calcification

Chronic lung disease (fibrosis)

People working in asbestos factory can have lung disease due to inhalation of asbestos (Asbestosis)

COMMON DISEASES CAUSED BY CHANGES IN ENVIRONMENT (AIR POLLUTION)



Lymph node calcification

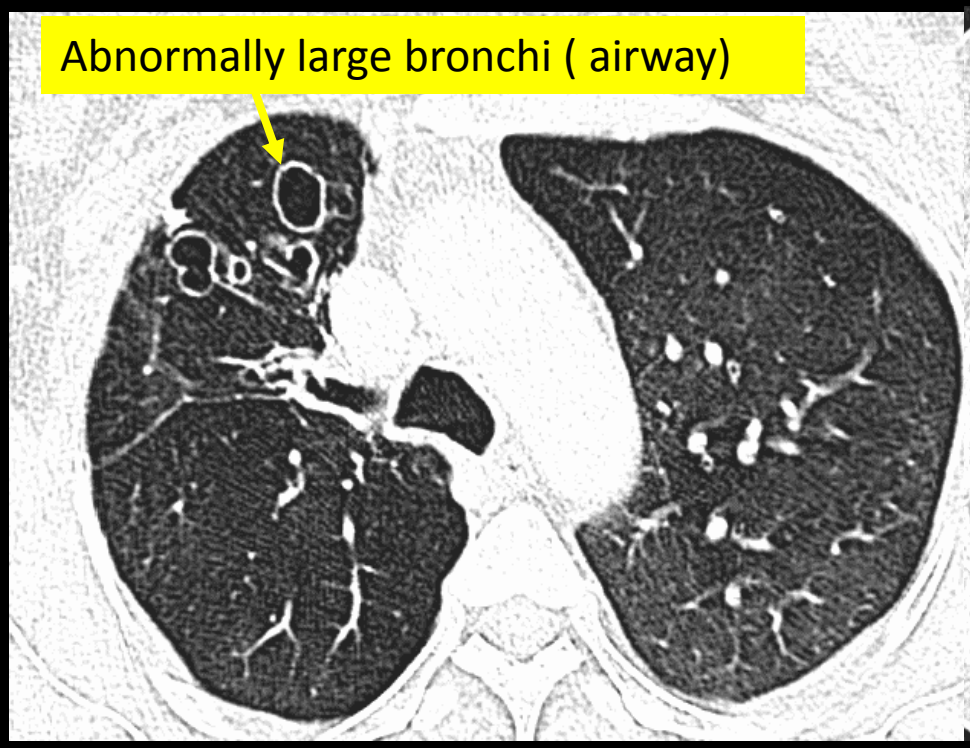
Chronic lung disease (fibrosis)

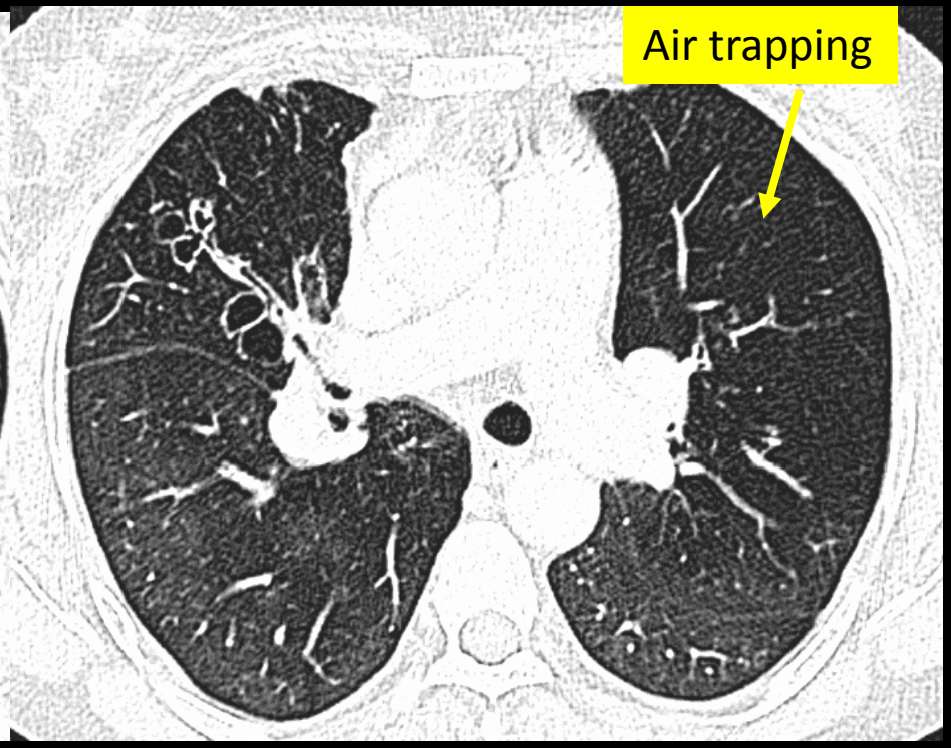
People working in sand blasting or mining can have lung disease due to inhalation of silica (Silicosis)

COMMON DISEASES CAUSED BY CHANGES IN ENVIRONMENT (AIR POLLUTION)

Fungi in cotton dust can cause fever and difficulty in breathing (Byssinosis)

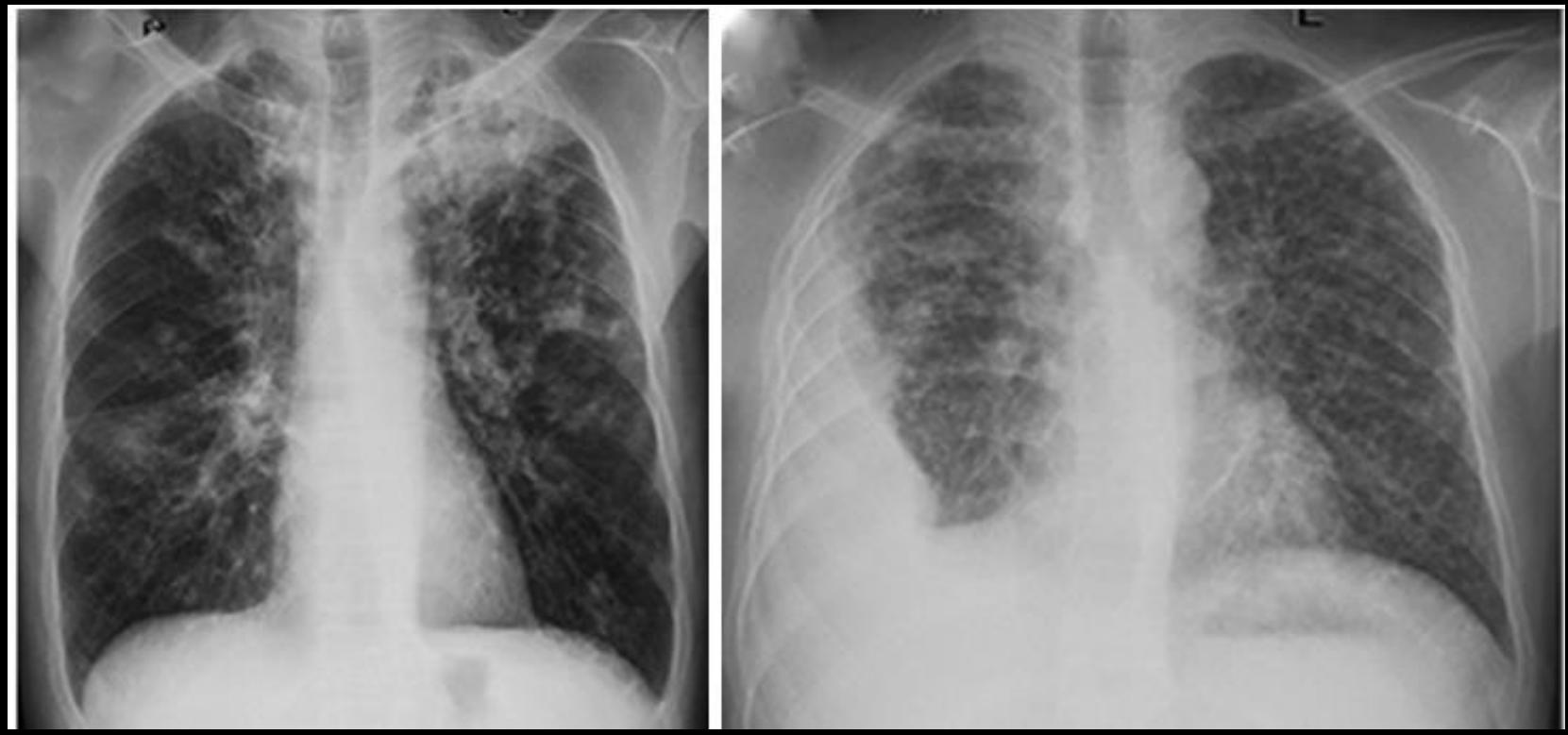
COMMON DISEASES CAUSED BY CHANGES IN ENVIRONMENT (AIR POLLUTION)





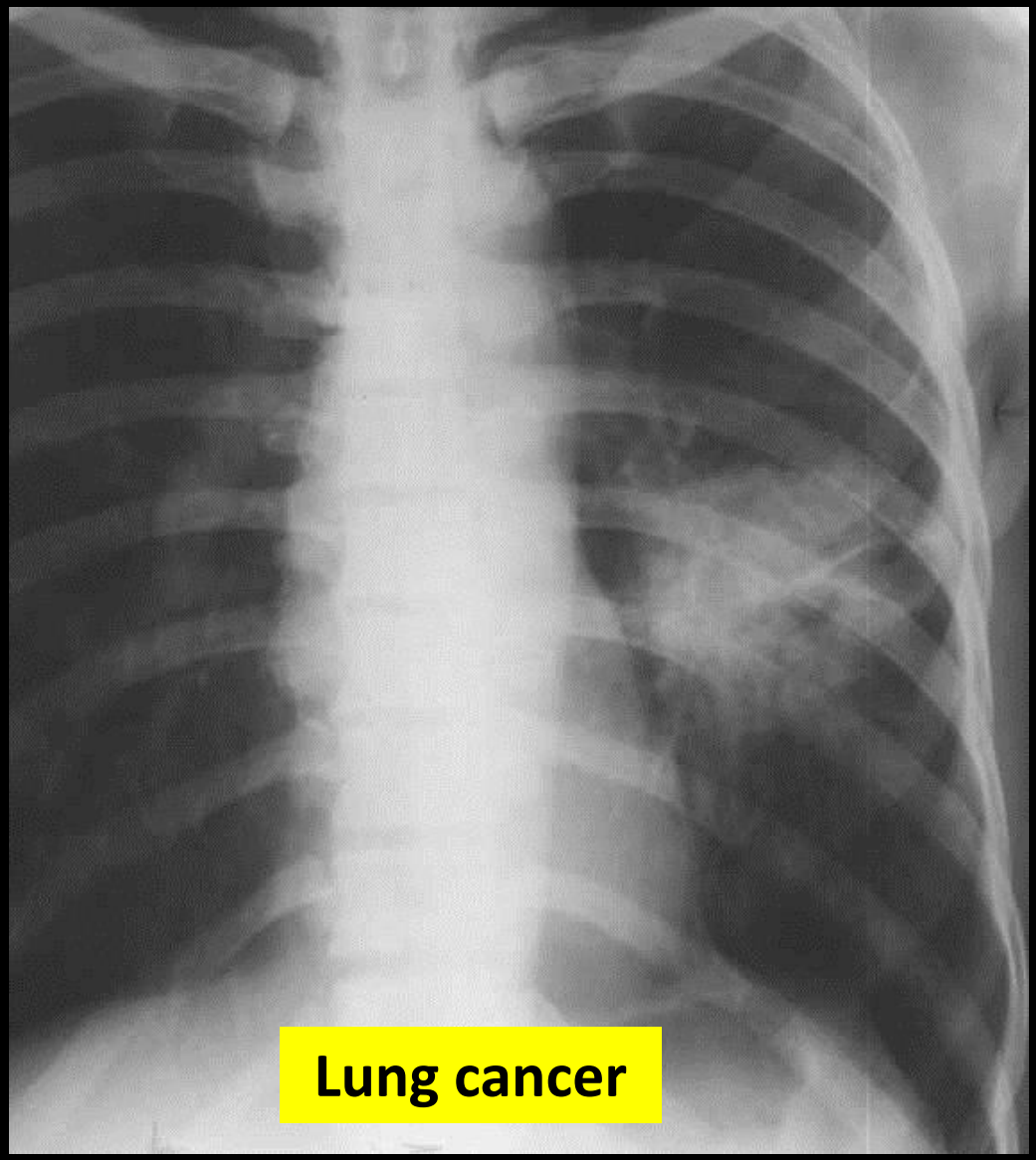
Cooking in ‘chullah’ within a confined space can cause chronic lung disease.

COMMON DISEASES CAUSED BY CHANGES IN ENVIRONMENT (AIR POLLUTION)



Tuberculosis

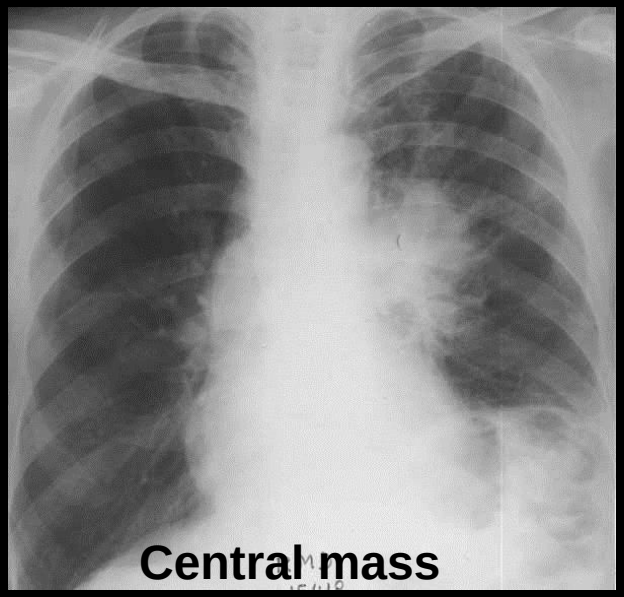
COMMON DISEASES CAUSED BY CHANGES IN ENVIRONMENT (AIR POLLUTION)



Lung cancer

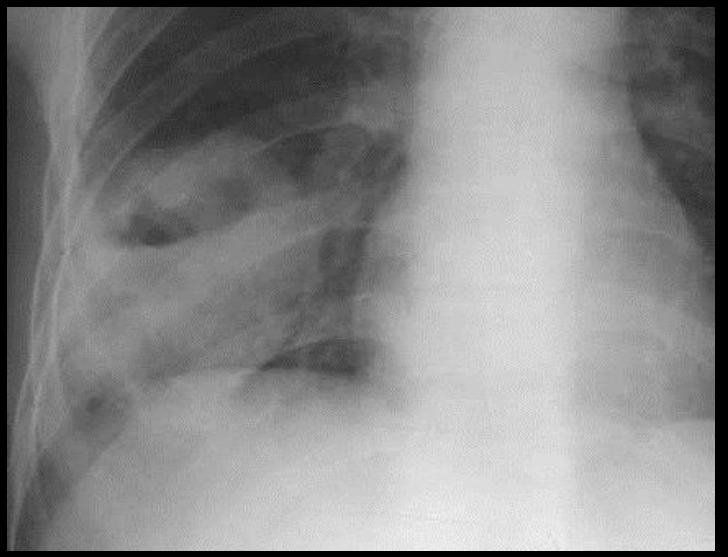
Bronchietasis

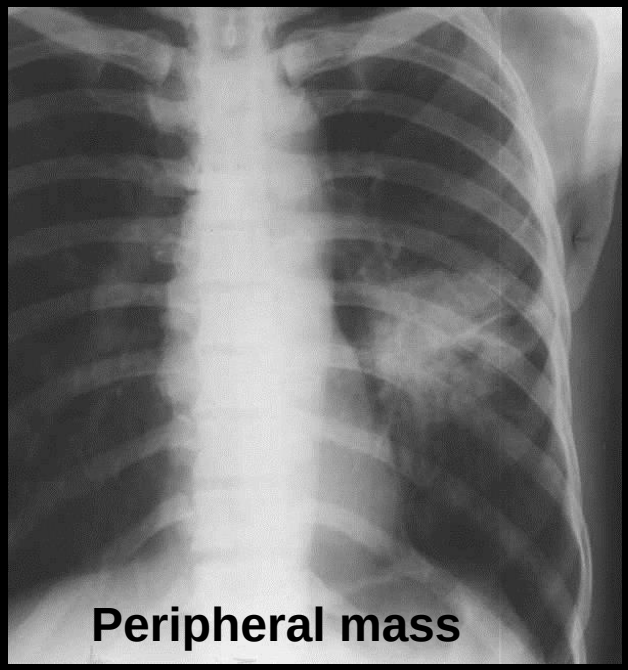
LUNG CANCER

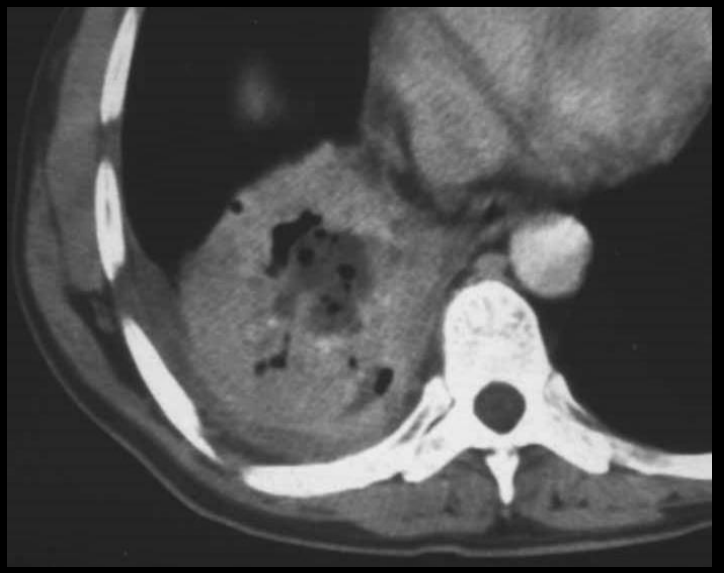


ROLE OF RADIOLOGIST

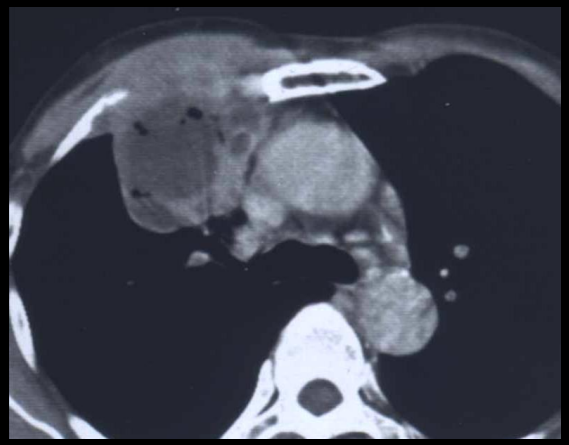
- DIAGNOSIS
- STAGING
- MANAGEMENT

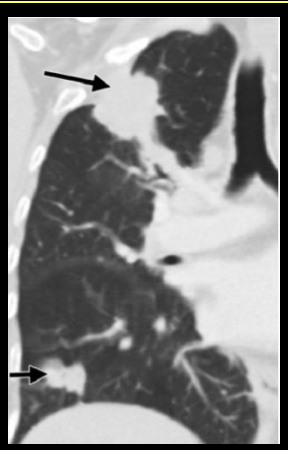


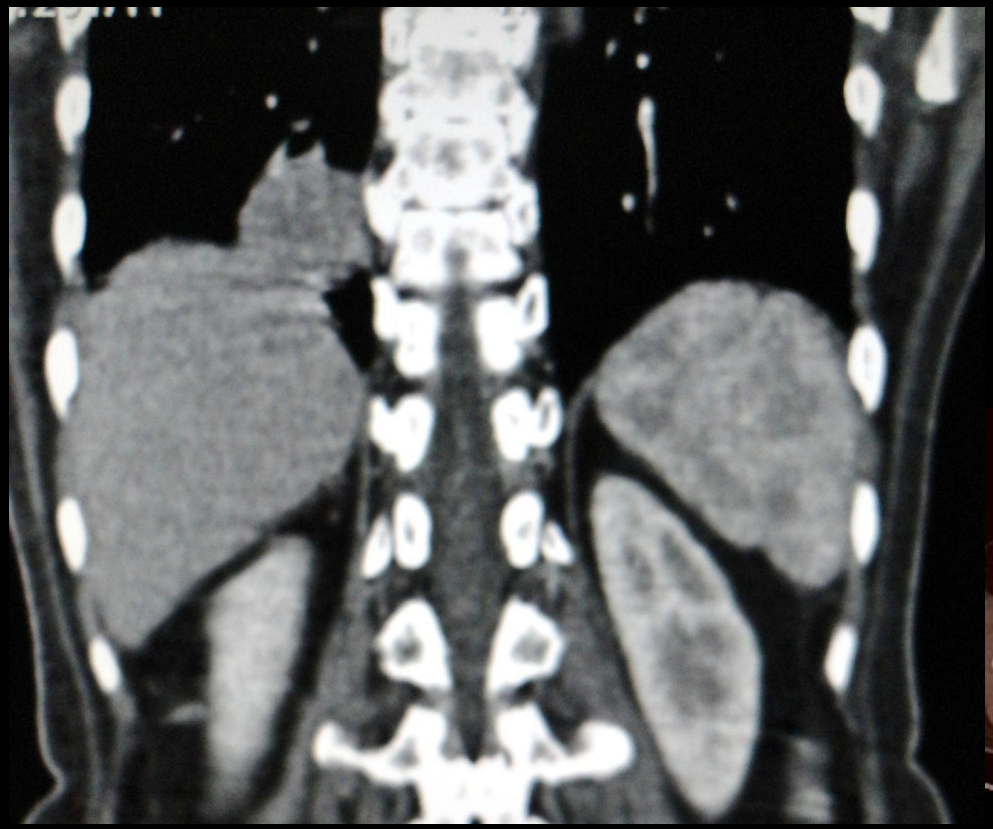


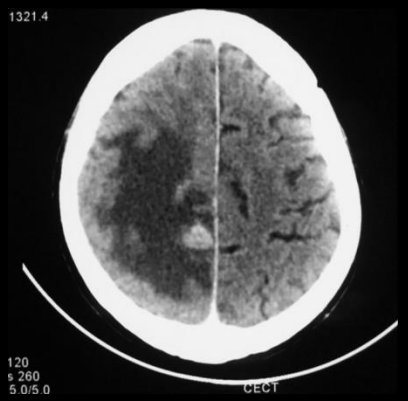


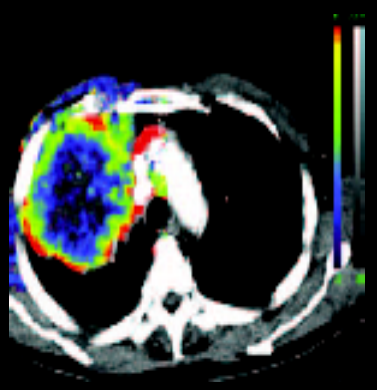
LUNG CANCER





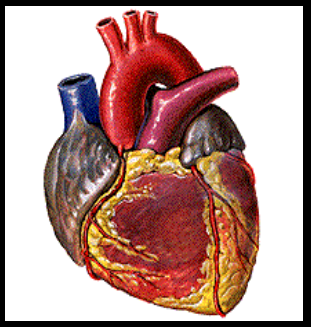






LUNG DISEASES : Pulmonary embolism

HEART DISEASES



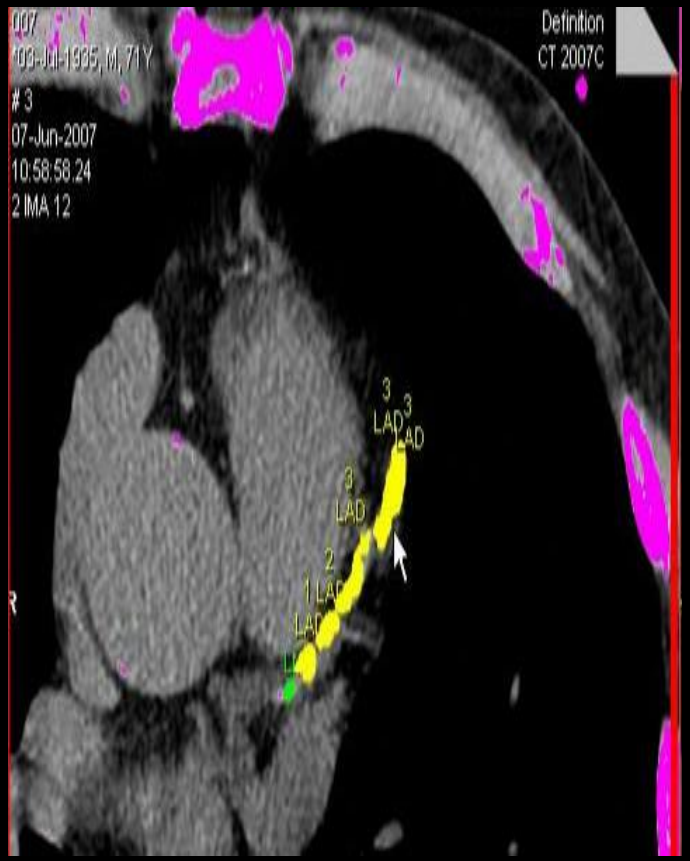
IMAGING OF CAD

CORONARY CALCIUM SCORING

CORONARY PLAQUE IMAGING

CT CORONARY ANGIOGRAPHY

ACUTE CHEST PAIN EVALUATION (TRIPLE RULE OUT)



Threshold = 130 HU
(103.2 mg/cm³ CaHA)

Artery	Number of Lesions (1)	Volume [mm³] (3)	Equiv. Mass [mg CaHA] (4)	Calcium Score (2)
LM	1	81.5	16.46	93.7
LAD	4	418.3	110.40	507.7
CX	1	18.7	4.13	23.3
RCA	4	178.2	36.67	199.5
Total	10	696.7	167.66	824.3

(1) Lesion is volume based
(2) Equivalent Agatston score
(3) Isotropic interpolated volume
(4) Calibration Factor: 0.794

HEART DISEASES

IMAGING OF CAD

CORONARY CALCIUM SCORING

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ACUTE CHEST PAIN EVALUATION

(TRIPLE RULE OUT- Aorta/PA/CAD)

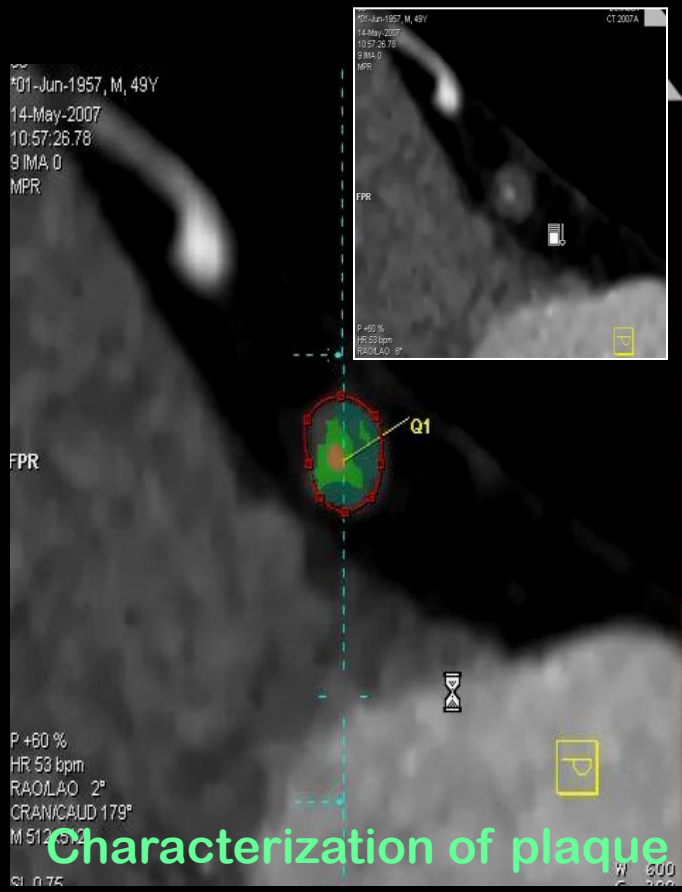
TYPES OF PLAQUE

- Lipid-rich plaques
- Intermediate plaques
- Calcified plaques

Lipid plaques more vulnerable than calcified plaques

Non calcified plaque

Mixed plaque



Characterization of plaque

HEART DISEASES

IMAGING OF CAD

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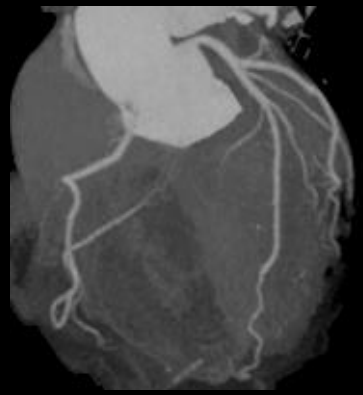
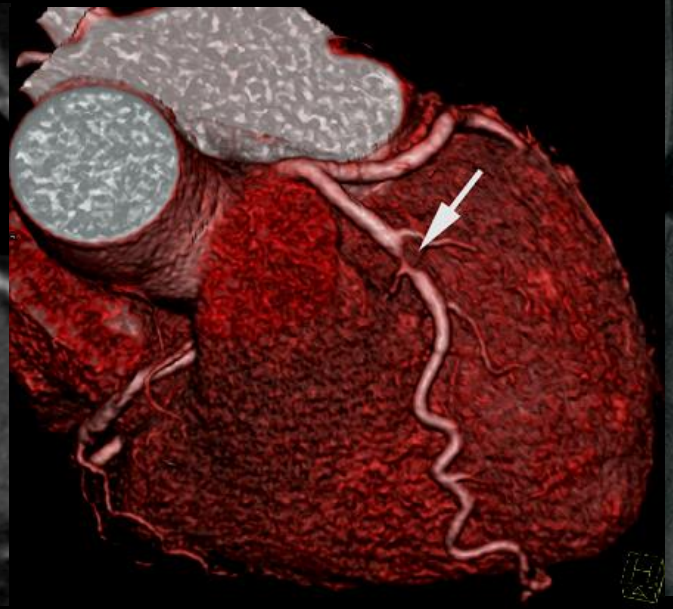
ACUTE CHEST PAIN EVALUATION (TRIPLE RULE OUT)

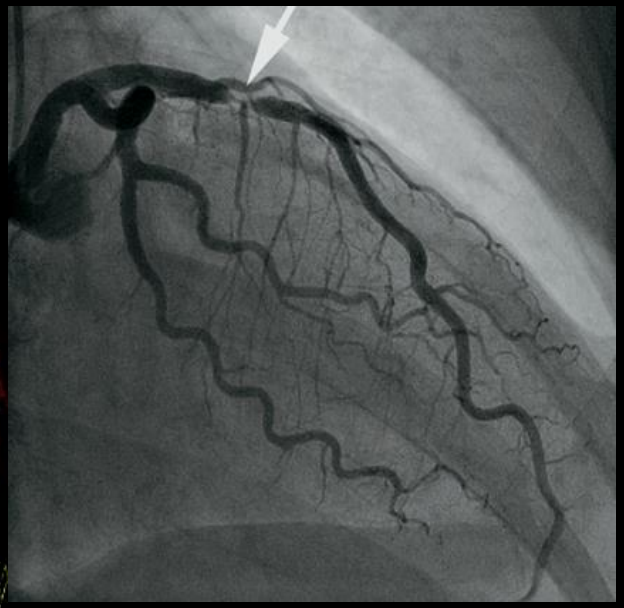
Volume rendering

Maximum Intensity Projection(MIP)



Coronary artery stenosis





HEART DISEASES

IMAGING OF CAD

CORONARY CALCIUM SCORING
CORONARY PLAQUE IMAGING
CT CORONARY ANGIOGRAPHY
ACUTE CHEST PAIN EVALUATION
(TRIPLE RULE OUT)

Rules out

- Acute coronary syndrome
- Aortic dissection
- Pulmonary embolism

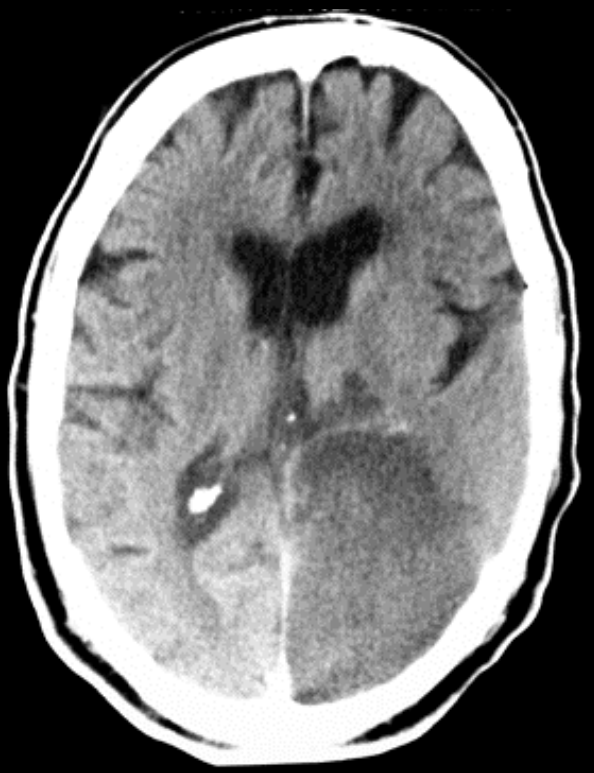
Pulmonary embolism

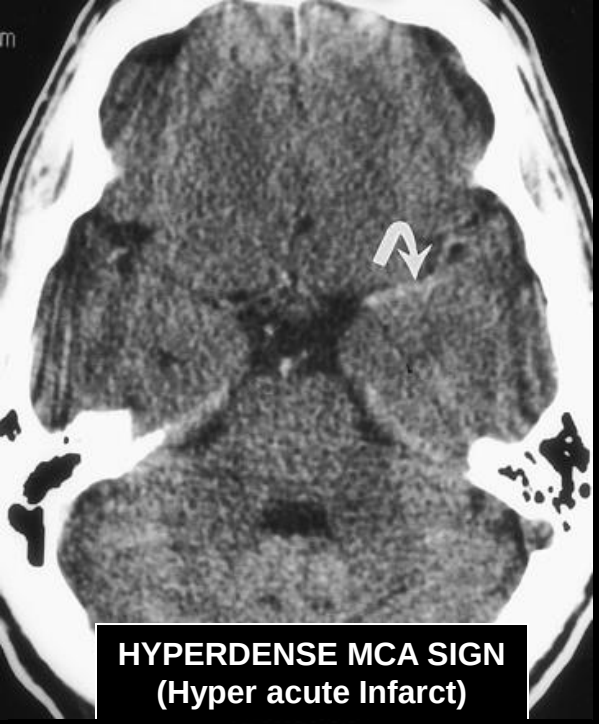
Aortic dissection

STROKE / CVA

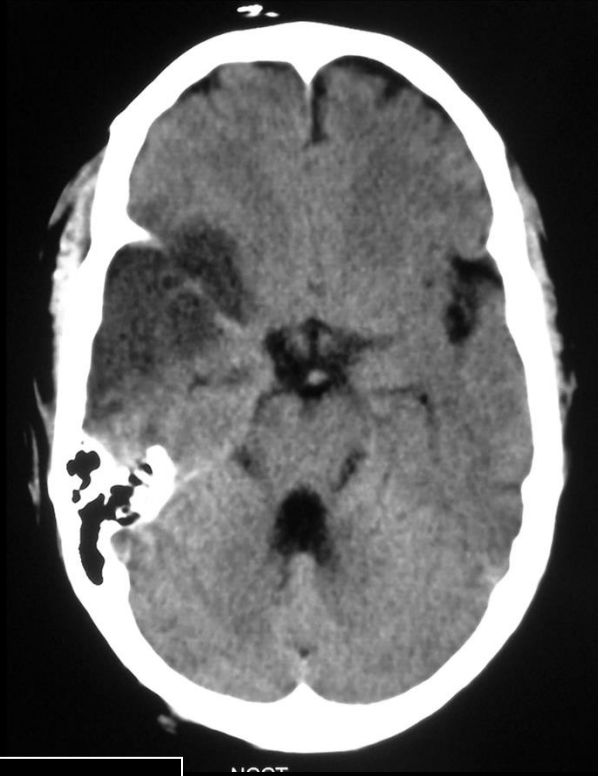
ROLE OF IMAGING

- ACCURATE & RAPID DIAGNOSIS
- CAUSE : Arterial / Venous
- INTERVENTIONAL TREATMENT
- COMPLICATIONS (HAEMORRHAGIC)



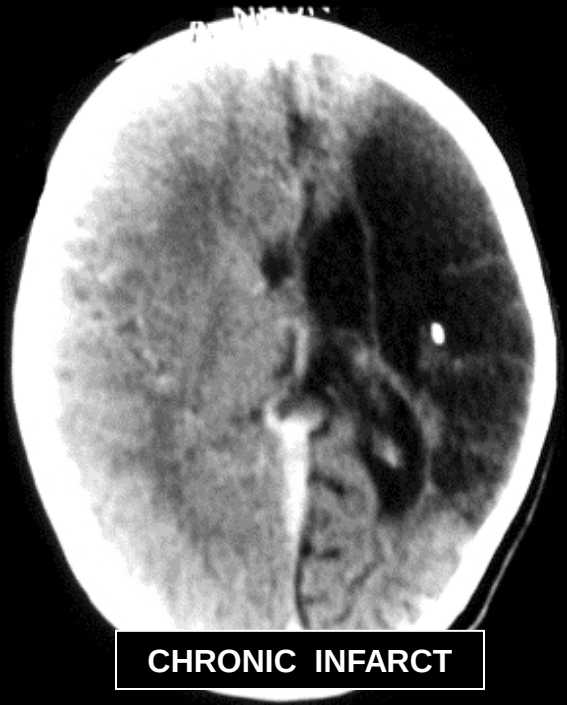


HYPERDENSE MCA SIGN
(Hyper acute Infarct)

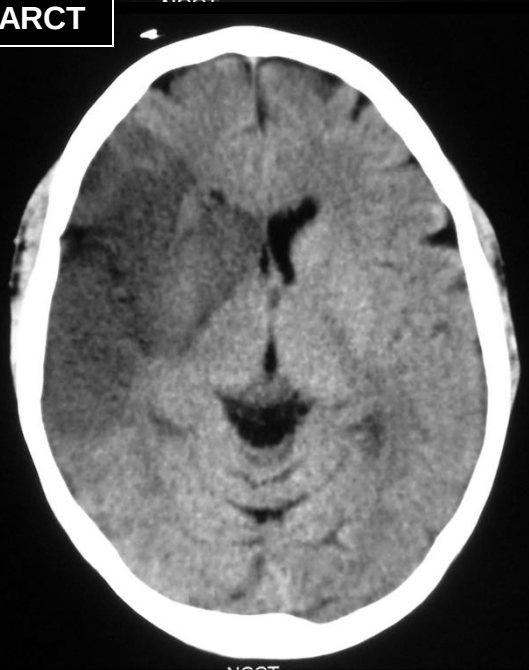


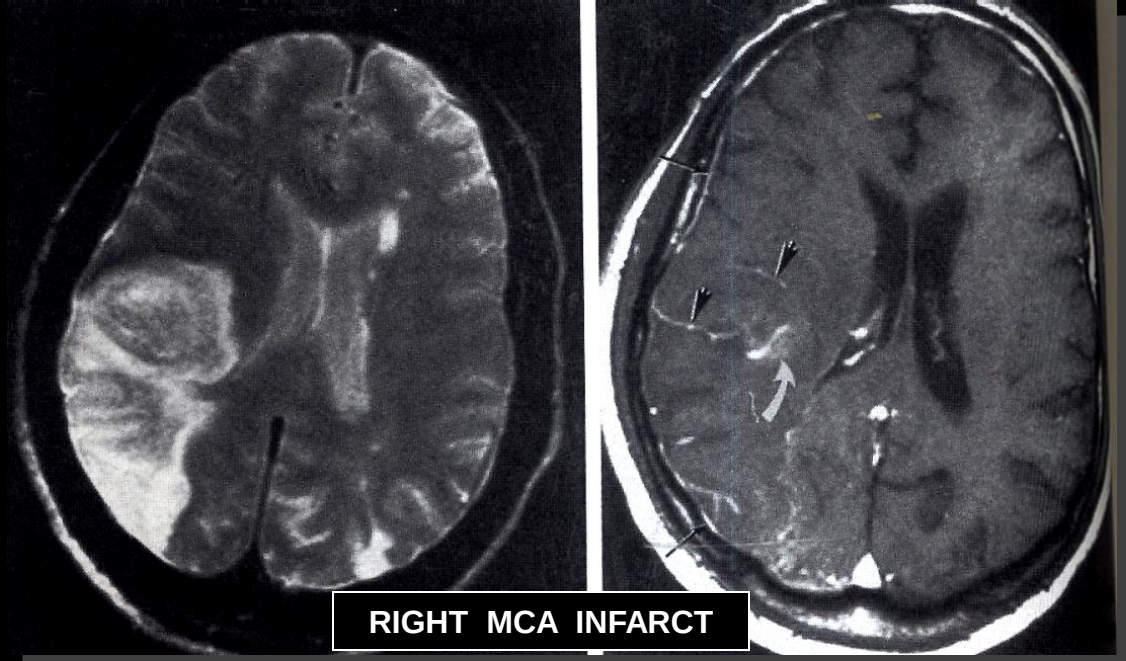
ACUTE INFARCT

LACUNAR INFARCT

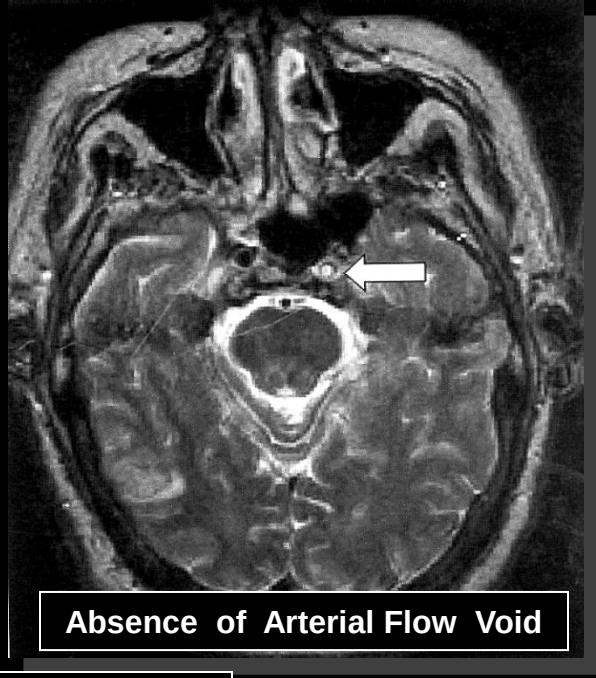


CHRONIC INFARCT



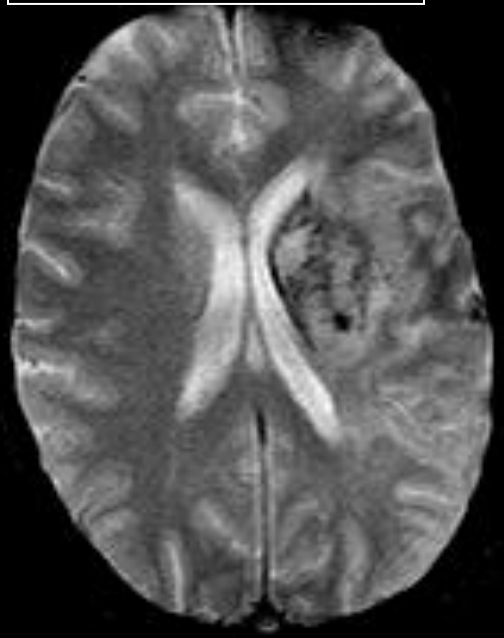


RIGHT MCA INFARCT

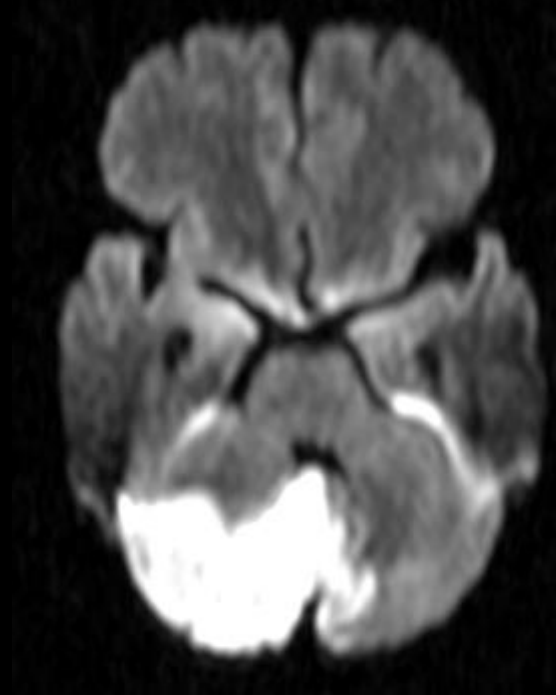


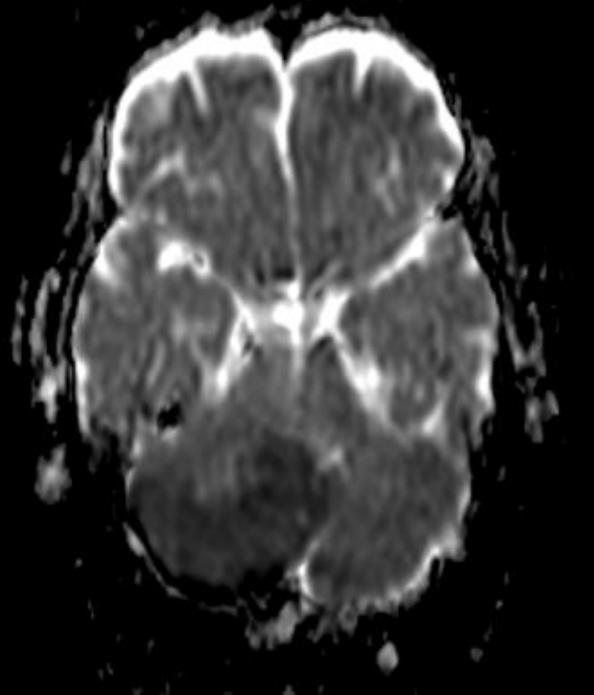
Absence of Arterial Flow Void

HAEMORRHAGIC RIGHT MCA INFARCT



RIGHT PICA INFARCT : DWI - ADC



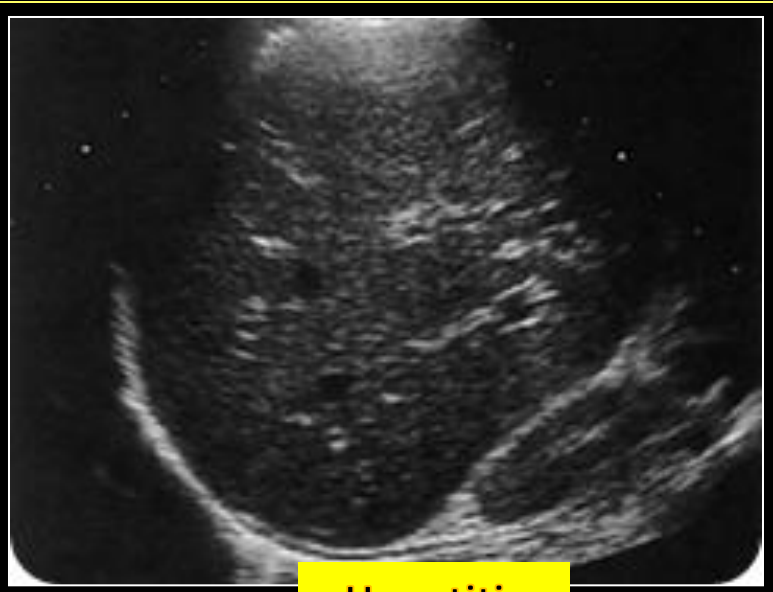


COMMON DISEASES CAUSED BY CHANGES IN ENVIRONMENT (WATER POLLUTION)

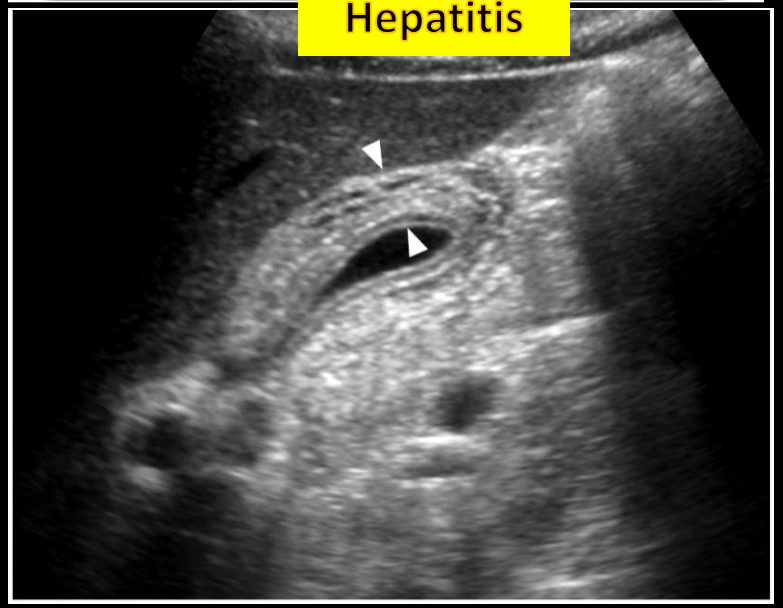
Excess amount of fluorine in drinking water can cause a crippling disease ‘Fluorosis’
The bones become weak, teeth are discoloured and have cavities

COMMON DISEASES CAUSED BY CHANGES IN ENVIRONMENT (WATER POLLUTION)

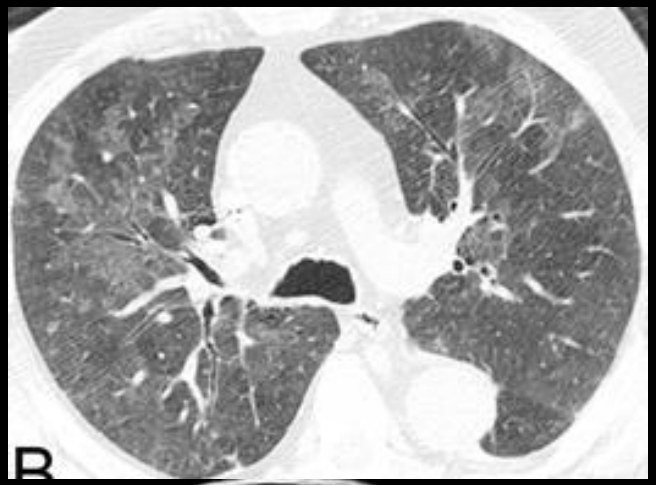
Typhoid affecting small intestine

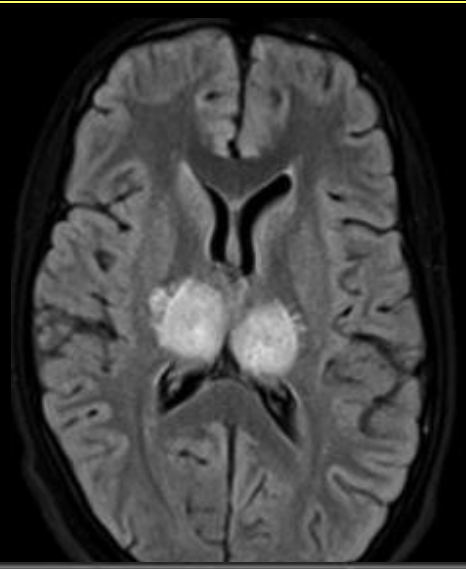


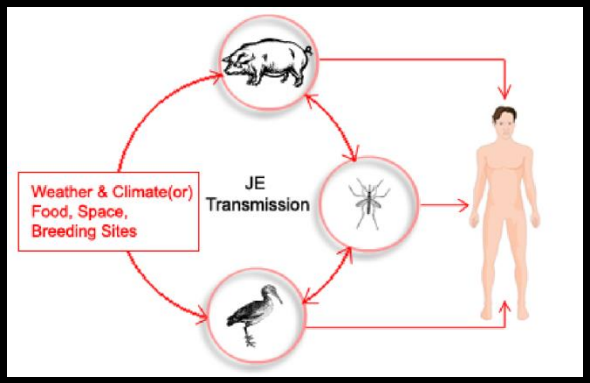
Hepatitis



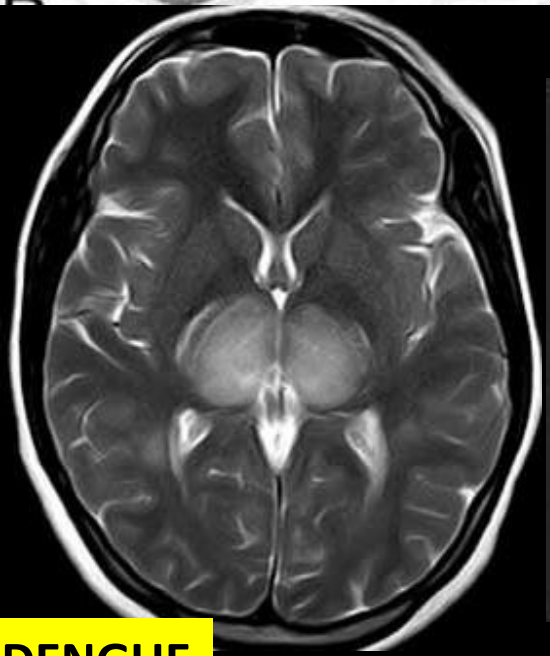
COMMON DISEASES CAUSED BY CHANGES IN ENVIRONMENT (VECTOR BORNE DISEASES)



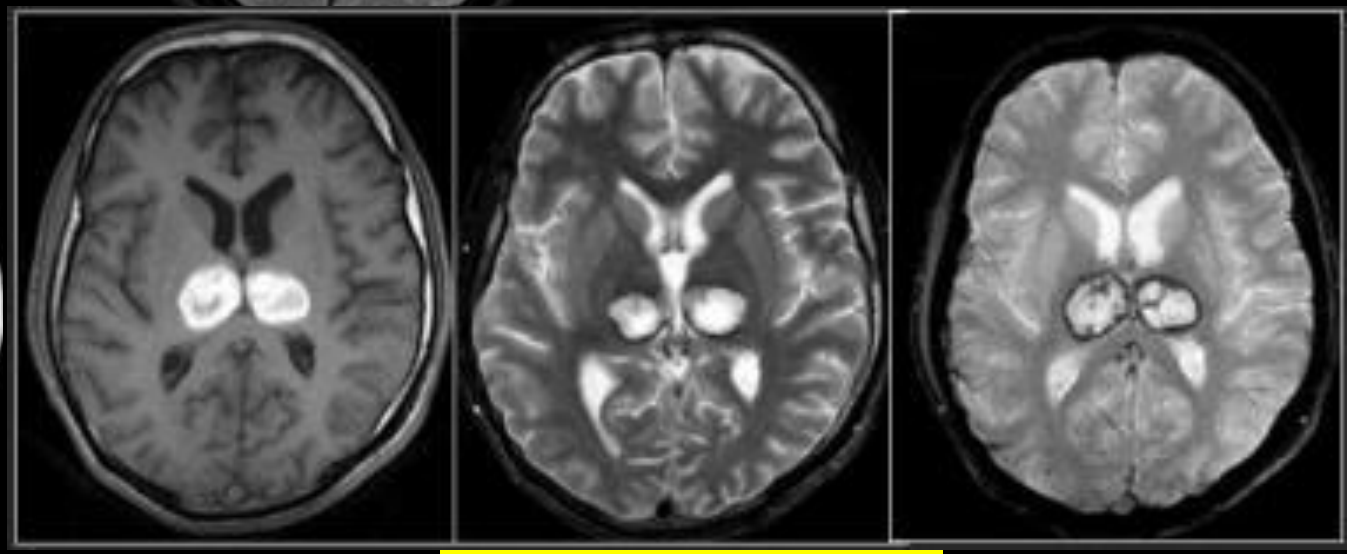




JAPANESE ENCEPHALITIS

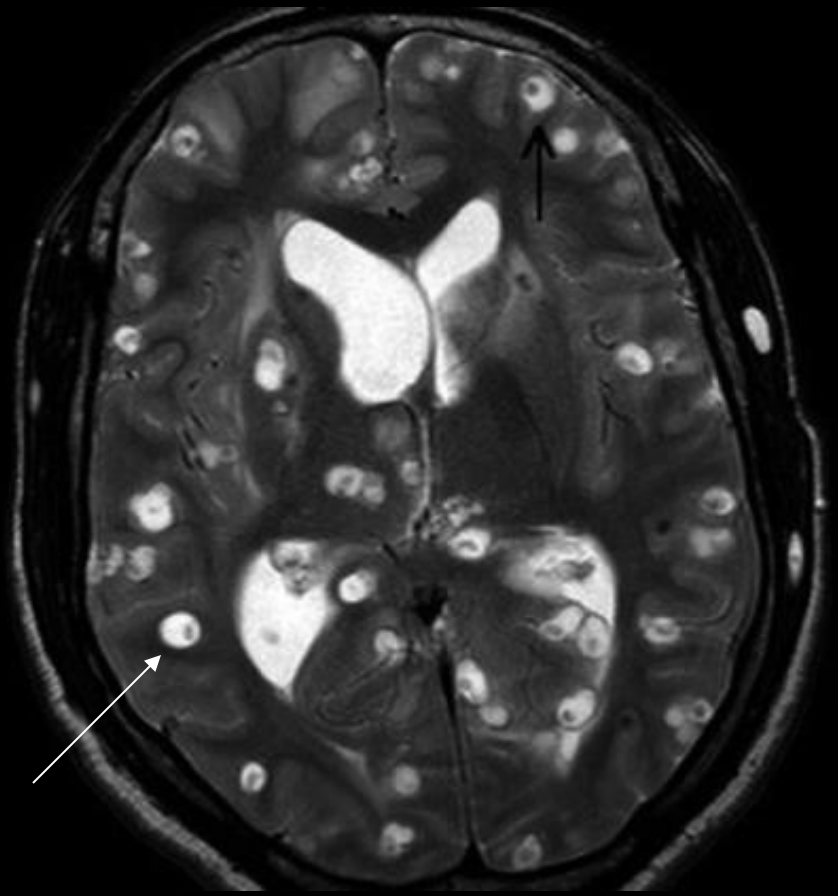


DENGUE



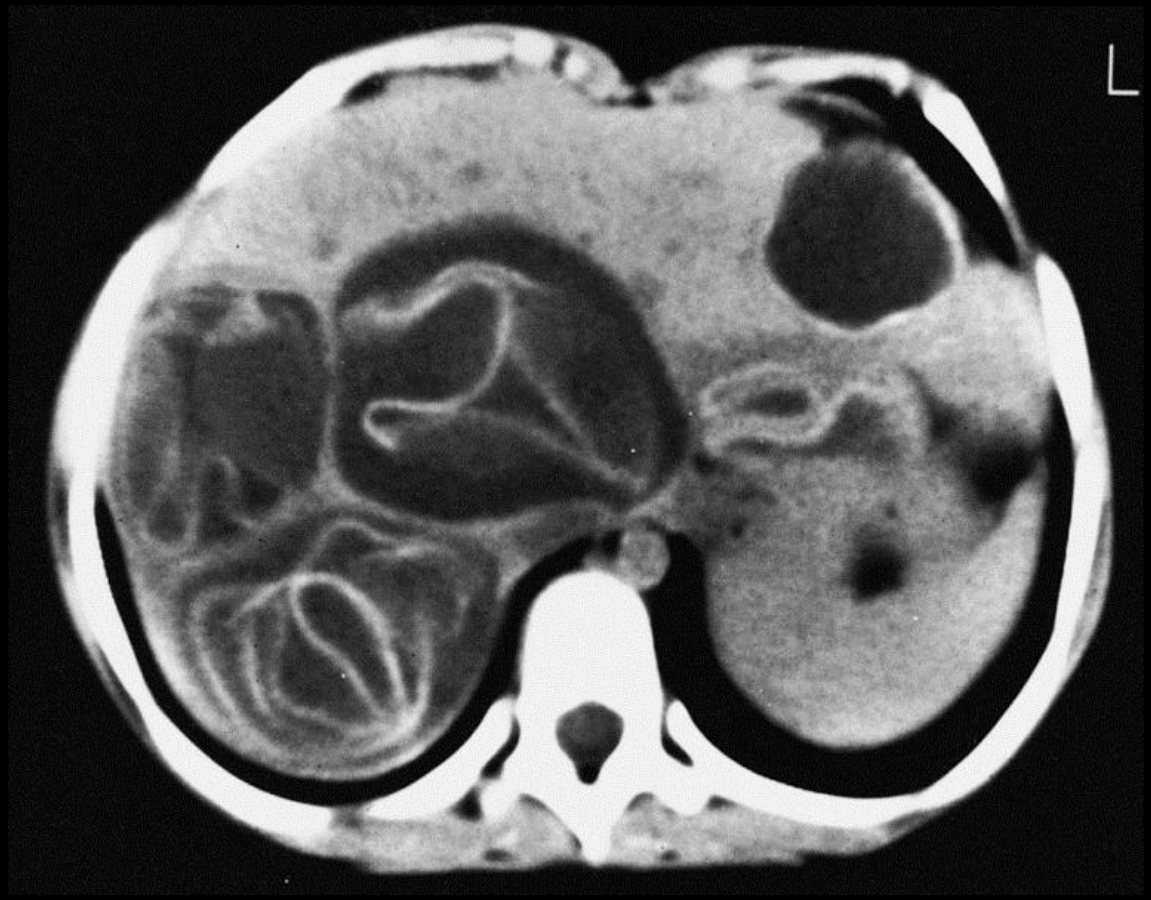
CEREBRAL MALARIA

COMMON DISEASES CAUSED BY CHANGES IN ENVIRONMENT (VECTOR BORNE DISEASES)



CYSTICEROSIS is a disease caused by pork tapeworm infection
The worms can infect muscles, eye, brain and can cause epilepsy

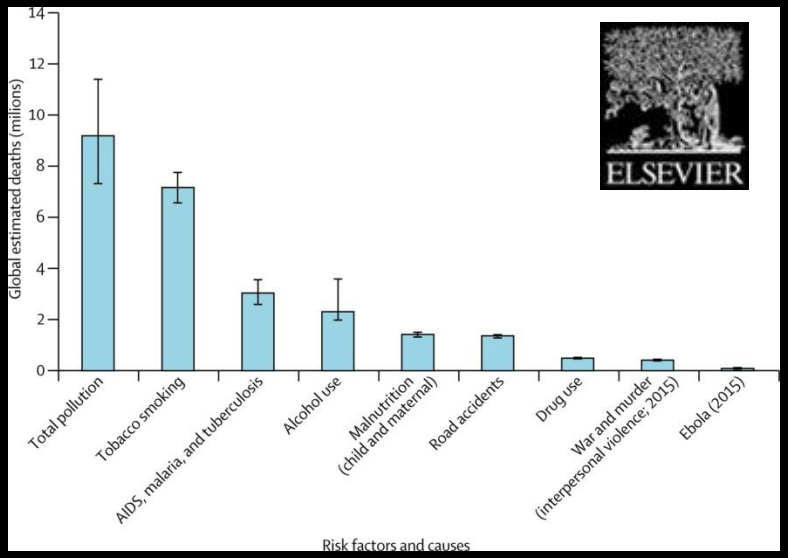
COMMON DISEASES CAUSED BY CHANGES IN ENVIRONMENT (VECTOR BORNE DISEASES)



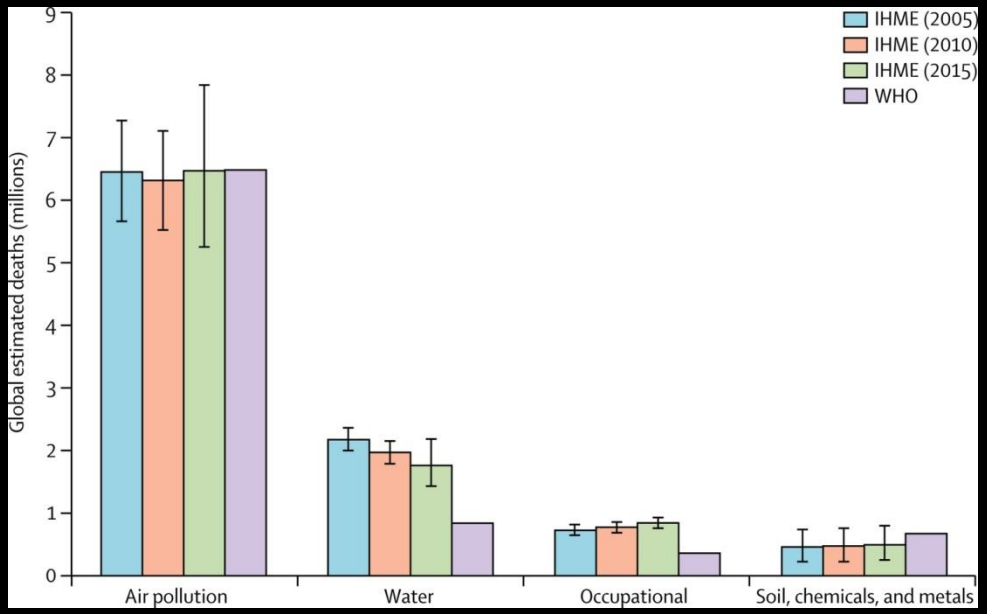
HYDATID disease is caused by dog tapeworm infection
The disease can infect lungs, liver and almost anywhere in the abdomen

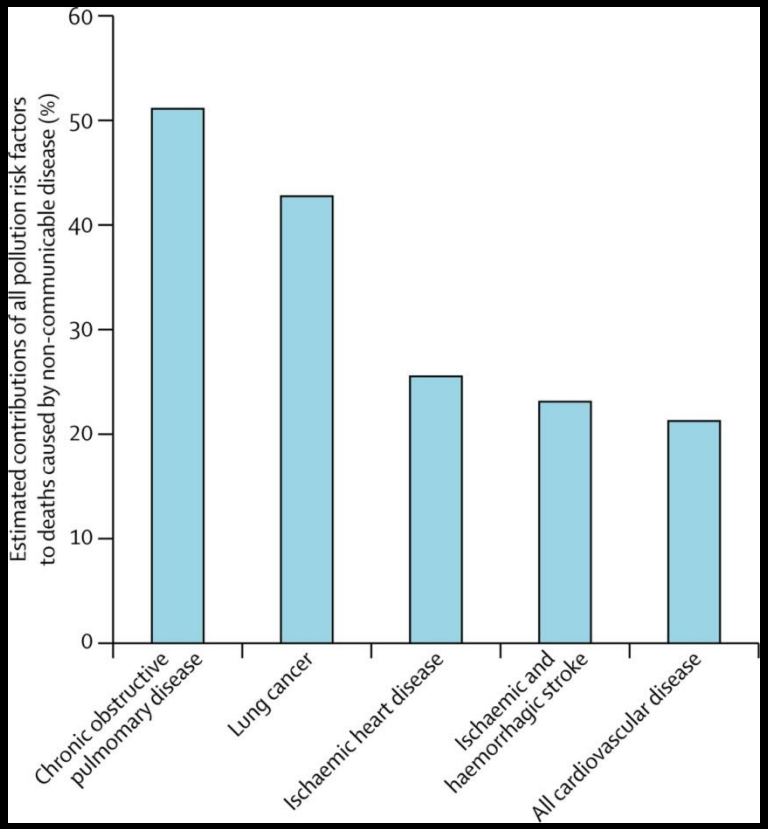
COMMON DISEASES CAUSED BY CHANGES IN ENVIRONMENT (VECTOR BORNE DISEASES)

Worm infestation (ASCARIASIS)



SUMMARY





ROLE OF RADIOLOGIST

- DIAGNOSIS
- STAGING
- MANAGEMENT

THANKS