

INTERNET NEWS

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gabra May Significantly Cut Alzheimer's Risk Study Finds

prescription medication shows potential as a treatment for dementia.

By [Don Rauf](#)

Reviewed: December 9, 2021



ildenafil is currently sold as Viagra to treat erectile dysfunction and as Revatio to improve the ability to exercise in adults with pulmonary arterial hypertension. John Greim/Getty Images

analysis of a large insurance-record database of more than seven million Americans has found that Viagra may reduce the risk of Alzheimer's dementia by almost 70 percent

the study, published in the journal *Nature Aging* this month, a team of researchers from Cleveland Clinic in Ohio relied on computational methodology to identify drugs approved by the U.S. Food and Drug Administration (FDA) that could be used as potential therapies for Alzheimer's disease.

Scientists looked for medications that target amyloid plaques and tau tangles, which are believed to be responsible for the brain damage associated with *Alzheimer's disease*. Because the interplay between these two molecules is a greater contributor to Alzheimer's than either amyloid or tau by itself, the investigators further narrowed their focus to pinpoint therapies that attack both.

Sildenafil, which has been shown to significantly improve cognition and memory in clinical models, presented as the best drug candidate," said the study team's leader, *Feixiong Cheng, PhD*, of Cleveland Clinic's *Genomic Medicine Institute*.

MedlinePlus, the drug is a common prescription medication, currently sold as *Viagra* to treat *erectile dysfunction* and as *Revatio* to improve the ability to exercise in adults with pulmonary arterial *hypertension* (high blood pressure in the vessels carrying blood to the lungs, causing *shortness of breath*, dizziness, and tiredness).

A systematic review published in April 2020 in the *Journal of Alzheimer's Disease Reports* looked at research evaluating *sildenafil* in relation to Alzheimer's and found the medication to be linked with increased neurogenesis (growth and development of nerve cells) and decreased inflammation.

type of benefit makes sense, according [Len Horovitz, MD](#), an internist and coronary specialist with Lenox Hill Hospital in New York City, because sildenafil improves blood flow.

But neurologists will tell you that one of the most important things in Alzheimer's is exercise, because exercise increases blood flow," says Dr. Horovitz, who was not involved in the study. "Anything that increases blood flow will have a beneficial effect on brain function. It wouldn't surprise me if this is going to be a promising treatment — although whether it offers prevention, it's hard to say."

Results from this study suggested that prevention might indeed be an outcome. In the analysis of insurance claims data for 7.23 million individuals, Cheng and his collaborators found that sildenafil users were 69 percent less likely to develop Alzheimer's disease than non-sildenafil users after six years of follow-up.

Looking at sildenafil in relation to other meds being explored as potential Alzheimer's treatments, the study authors discovered that Viagra/Revatio provided a 55 percent reduced risk of the disease compared with [losartan](#), 63 percent compared with [metformin](#), 65 percent compared with [diltiazem](#), and 64 percent compared with [glimepiride](#).

Cheng highlighted that sildenafil reduced the likelihood of Alzheimer's in individuals with [coronary artery disease](#), hypertension, and type 2 diabetes (all of which are comorbidities significantly associated with risk of dementia) as well as in those without these conditions.

the study established a link between the drug and preventing Alzheimer's, the researchers stressed that this investigation did not prove that sildenafil actually offers protection or benefit in this regard.

In separate research examining brain cells from Alzheimer's patients, Cheng and his collaborators found that sildenafil increased brain cell growth and decreased hyperphosphorylation of tau proteins (a process that leads to neurofibrillary tangles). The results gave scientists some biological insights into how the drug may protect the brain.

As many as 5.8 million Americans are living with Alzheimer's disease, and the number of people older than 65 with the disease doubles every five years, according to the Centers for Disease Control and Prevention (CDC). While the Alzheimer's Association lists several treatments that may slow disease progression, no cure exists.

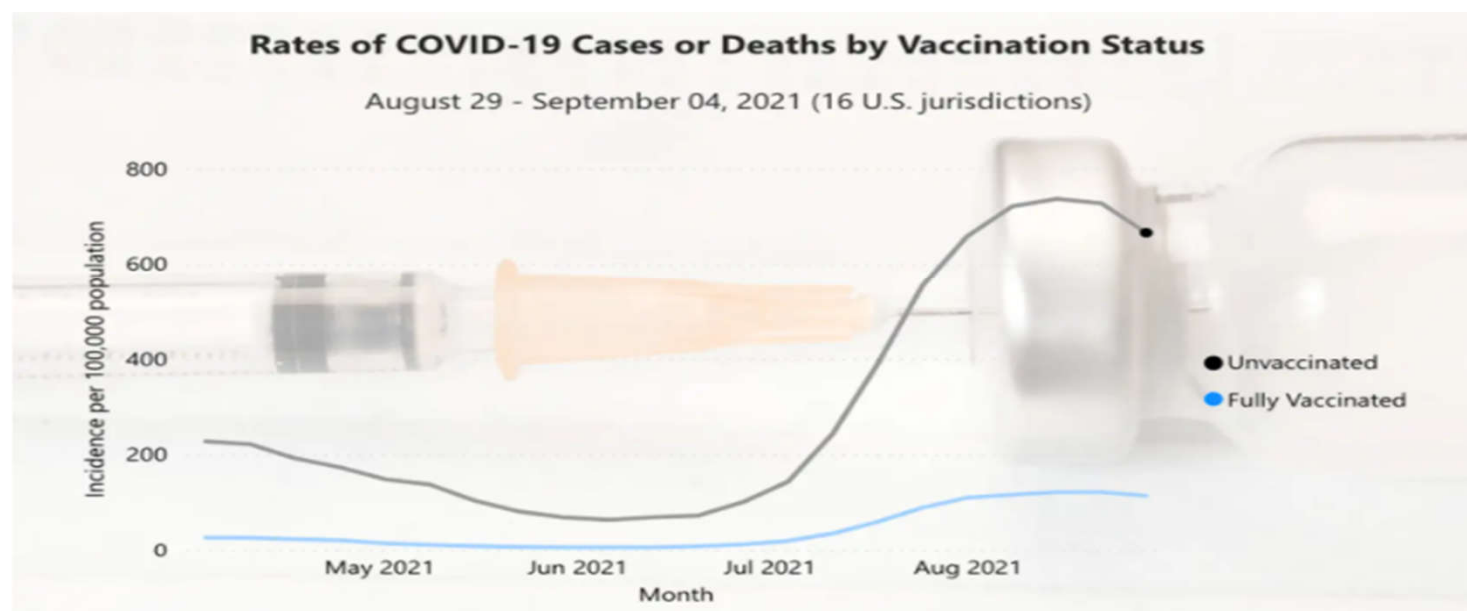
More than ever before, Alzheimer's researchers understand that a variety of approaches are needed — most likely used in combination — for effective treatment of the disease," says Claire Sexton, DPhil, the director of scientific programs and outreach for the Alzheimer's Association. "Scientists are more extensively testing the potential benefits of drugs approved for other diseases for the treatment of dementia. Repurposing existing drugs for new uses can speed up the research process ... and review by the U.S. Food and Drug Administration."

Special Reports > Exclusives

CDC Now Reports COVID Cases and Deaths by Vax Sta

— New tool also reveals numeric differences between vaccines

by Sophie Putka, Enterprise & Investigative Writer, MedPage Today October 19, 2021



The CDC has begun to provide weekly data on [COVID-19 cases and deaths by vaccination status](#), illustrating the stark differences between those who have received the shots and those who haven't -- and even revealing some differences between vaccines.

s can parse the data by vaccine product, and while the unvaccinated have the highest rates of cases and deaths, there's a numeric divergence for the three vaccine lines as well.

Deaths among the unvaccinated peaked the week starting August 8, at 13.23 per 100,000 population, while deaths among those who had been vaccinated with any of the three products remained under four per 100,000 that week. For the fully vaccinated, deaths were numerically highest among Johnson & Johnson recipients at 1.14 per 100,000, followed by Pfizer at 1.43, and Moderna at 0.73.

Cases were similarly highest among the unvaccinated, peaking at about 736 per 100,000 for the week starting August 15. Again, there were numeric differences between vaccine groups, with Johnson & Johnson being the highest (172), followed by Pfizer (135), and Moderna (86).

Despite those differences, the overall message is clear: the unvaccinated were at a much greater risk of being infected with and dying from COVID-19.

The latest data from August 29-September 4 show that less than one vaccinated person per 100,000 had died the previous week compared with more than nine unvaccinated people per 100,000. Overall, in August, according to the tool, unvaccinated people were 6.1 times more likely than fully vaccinated people to be positive for COVID-19 and 11.3 times more likely to die from it.

"The vaccines are extremely effective, and showing the data are key," said Leana S. Chaitin, MD, MSc, an emergency physician and professor of health policy and management at George Washington University. "This tool continues to emphasize the key point that vaccines prevent infections and, critically, dramatically reduce hospitalizations and deaths from COVID-19."

ers can also search by age group, and differences among those between the vaccinated and unvaccinated.

CDC press officer told *MedPage Today* in an email that the "purpose of the new page is to provide information to the public on rates of cases and deaths among fully vaccinated and unvaccinated people." The data "show that more people who are unvaccinated have severe outcomes due to COVID-19 versus people who are fully vaccinated." Similar data had appeared in the CDC's *Morbidity and Mortality Weekly Report* from September 17, the press officer added.

The numbers are not, so far, being updated in real time. "A reporting lag of at least a month is needed to allow sufficient time for accurate reporting of COVID-19 associated deaths," the press officer wrote. However, the CDC has [case, death, and vaccination data](#) as current as 1 day ago on various pages under their data tracker. The data come from 16 state health departments, representing 30% of the U.S. population. The CDC will update the numbers as more jurisdictions participate.

The CDC's extra efforts to encourage vaccination come at a particularly trying time for public health officials, as they battle vaccination rates that were [lower than expected](#), and the [lowest of the G7 nations](#).

What will the new official stats make a big impact? Not likely, said Paul Offit, MD, director of the Vaccine Education Center at Children's Hospital of Philadelphia. While he agreed that it's a useful tool, "at this point, quite frankly, I don't know how much more information people need that the vaccine is a way to keep you from being hospitalized or dying."

"I'd like to know what percentage of people in the United States have heard of COVID," Offit said, "much less what their recommendations are regarding masking and vaccinating."

The tool appeared on the CDC website the week of October 15, and a link to it can be found via the CDC's [COVID Data Tracker](#).



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🔍 RSNA 2021 Digital X-Ray Preview

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AI captures bone mineral density data from hip x-rays

by [Mark L. Ridley](#), AuntMinnie.com staff writer

Monday, November 28 | 1:00 p.m.-2:00 p.m. | SSMK03-1 | Room TBA

In this talk, researchers will show how bone mineral density data can be obtained from hip radiographs by an artificial intelligence (AI) algorithm.

ough dual-energy x-ray absorptiometry (DEXA) studies and extremity exams. To utilize a small amount of radiation, DEXA provides no additional diagnostic information. As a result, the research team from Thomas Jefferson University led by senior Dr. Simukayi Mutasa sought to utilize convolutional neural networks (CNNs) to obtain bone mineral density from diagnostic imaging studies performed for other purposes, beginning with hip radiographs.

The team first gathered a dataset of over 4,400 patients over the age of 25 who had received a DEXA exam and a hip or pelvic radiograph within a year. A script was then applied to extract quantitative labels -- the average of the hip, L-spine, femoral neck, and forearm when available -- as well as qualitative labels indicating normal bone density, osteopenia, or osteoporosis.

The researchers then manually annotated a bounding box of Ward's triangle on the anteroposterior view for each radiograph. These annotations were subsequently used to train a CNN to isolate the Ward's triangle on radiographs. Next, a second CNN was developed to classify the hip images as either normal, containing osteoporosis, containing osteopenia, or not containing the hip.

In preliminary validation, the CNN produced classification accuracy of 81.2%, sensitivity of 83.8%, specificity of 77.2%, and an area under the curve (AUC) of 0.89.

"This deep-learning system, when applied to extremity radiographs such as the hip, can diagnose abnormalities in bone mineral density similar to a DEXA scan," the authors wrote.



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Researchers test x-ray prototype

Morton, AuntMinnie.com staff writer

Monday, November 29 | 1:30 p.m.-2:30 p.m. | SSPH04-5 | Room TBA

Dr. Ran Zhang, PhD, will present a prototype developed by a group of physicists at the University of Wisconsin-Madison of a low-dose, contrast chest x-ray system that can provide three mutually complementary views from a single acquisition. The new system is fast and eventually could be used for diagnosing and screening for lung cancer, the team suggests.

SCIENTIFIC REPORTS

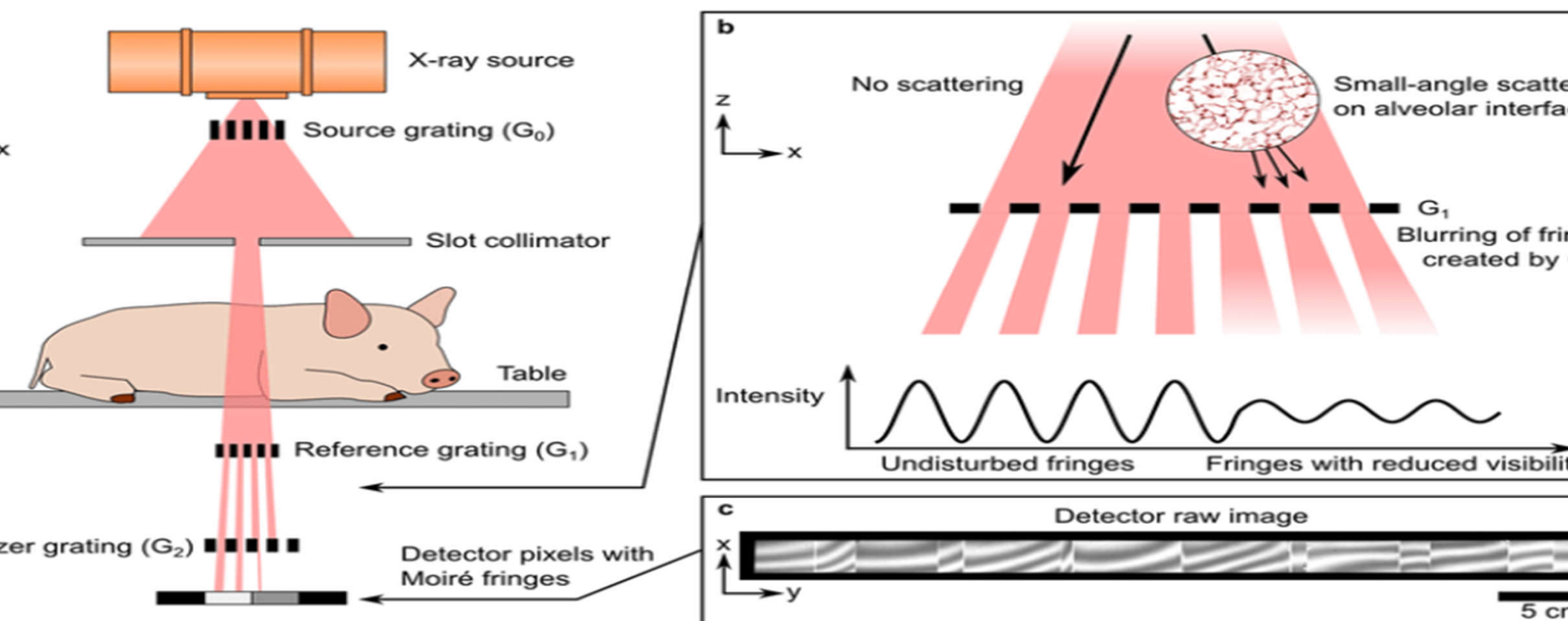


OPEN

In-vivo X-ray Dark-Field Chest Radiography of a Pig

chest radiography is an inexpensive and broadly available tool for initial assessment of the lung in clinical routine, but typically lacks diagnostic sensitivity for detection of pulmonary diseases in early stages. Recent X-ray dark-field (XDF) imaging studies on mice have shown significant improvements in imaging-based lung diagnostics. Especially in the case of early diagnosis of chronic obstructive pulmonary disease (COPD), XDF imaging clearly outperforms conventional radiography. However, a translation of this technique towards the investigation of larger mammals and finally humans has not yet been achieved. In this letter, we present the first *in-vivo* XDF full-field chest radiographs ($32 \times 35 \text{ cm}^2$) of a living pig, acquired with clinically compatible parameters (40 s scan time, 0.8 mAs , 80 kVp , $80 \text{ }\mu\text{Sv}$ dose). For imaging, we developed a novel high-energy XDF system that overcomes the limitations of currently established setups. Our XDF radiographs yield sufficiently high image quality for reliable radiographic evaluation of the lungs. We consider this a milestone in the bench-to-bedside translation of XDF imaging and expect XDF imaging to become an invaluable tool in clinical practice, as a general chest X-ray modality and as a dedicated tool for high-risk patients affected by smoking, industrial work and indoor cooking.

The lung consists of several hundred million air-tissue interfaces (formed by alveoli walls) that provide sufficient surface area for gas exchange for breathing. As clinically used conventional attenuation-based radiography of the lung cannot resolve these microstructures, its diagnostic window is mostly restricted to indirect signs caused by late-stage pathologies. In contrast, XDF radiography¹ is sensitive to the pulmonary micromorphology itself, as the aforementioned interfaces cause significant ultra-small-angle X-ray scattering and a corresponding XDF signal. Recent small-animal studies demonstrated that XDF imaging enhances pulmonary diagnosis, e.g. for the early detection and staging of COPD²⁻⁴, pulmonary fibrosis⁵, pneumothoraces⁶ and neonatal lung injury associated with mechanical ventilation⁷. Furthermore, the assessment of pulmonary carcinoma, edema, as well as pneumonia may significantly benefit from XDF imaging. These pathologies are characterized by a destruction (as in the case of COPD) or densification (by fibrotic or tumorous tissue) of the natural alveolar structure as the disease progresses. The loss of air-tissue interfaces consequently results in a reduction of the XDF signal compared to the reference signal of healthy lung tissue. Hence, variations in the XDF lung pattern can indicate pathological changes. The combination of XDF with conventional imaging can be used for differential diagnosis⁸.



field X-ray dark-field (XDF) chest radiography scanner. (a) Schematic of the prototype. A coarse array of fringes serves as a reference pattern created by a slight mismatch between the G_1 and G_2 grating. The position of the sample on the Moiré fringe is used to calculate the XDF images. (b) In case of the lung, millio-cron-sized alveoli (more precisely their air-tissue interfaces) scatter the X-rays, causing a blurring and frequent decrease of the G_1 fringe visibility. (c) Raw detector image with the reference Moiré fringe pattern that the vertical strikes arise from stitching together the borders of neighboring grating tiles and that the scale bar corresponds to the dimensions in the detector plane.

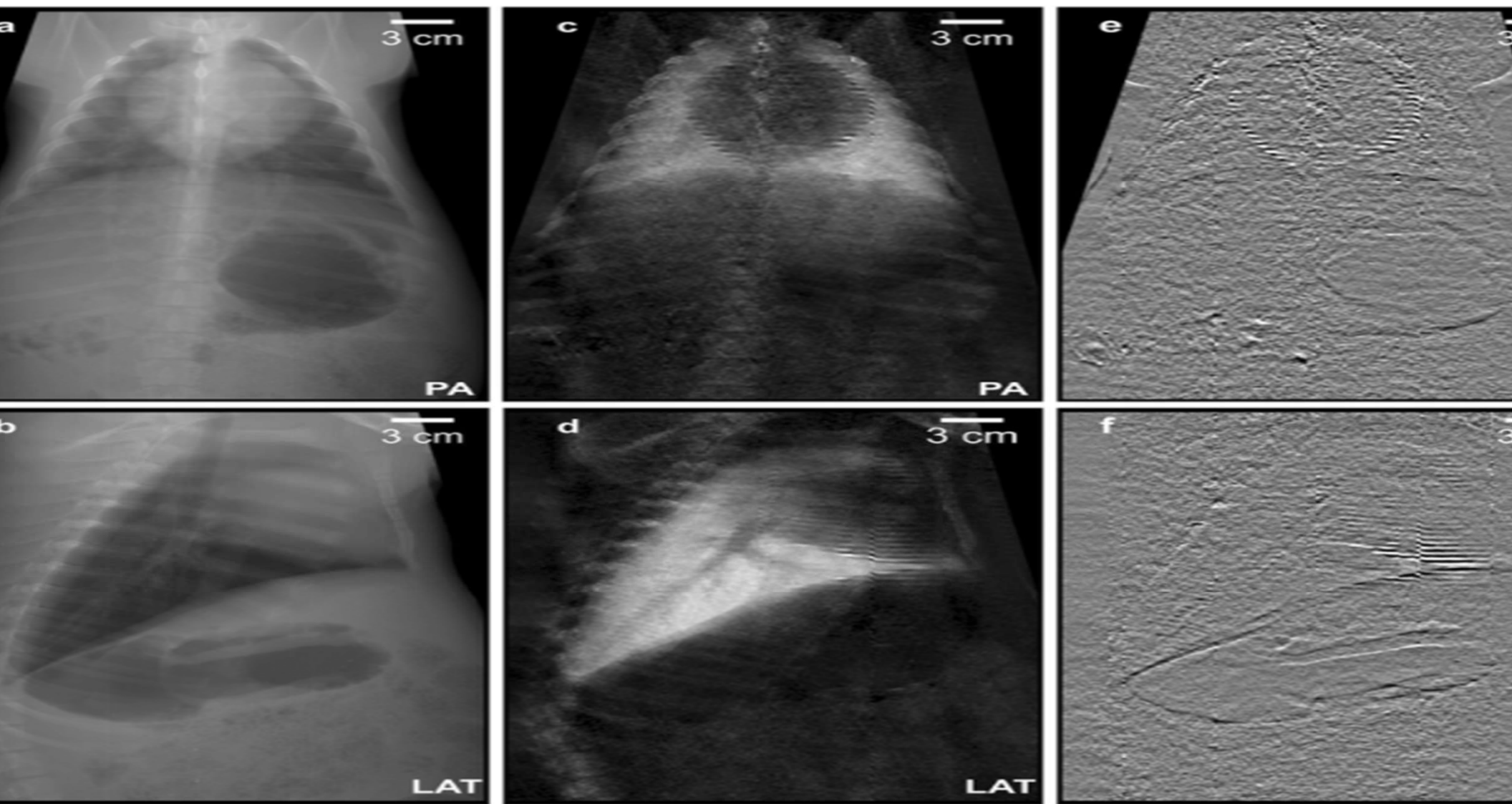
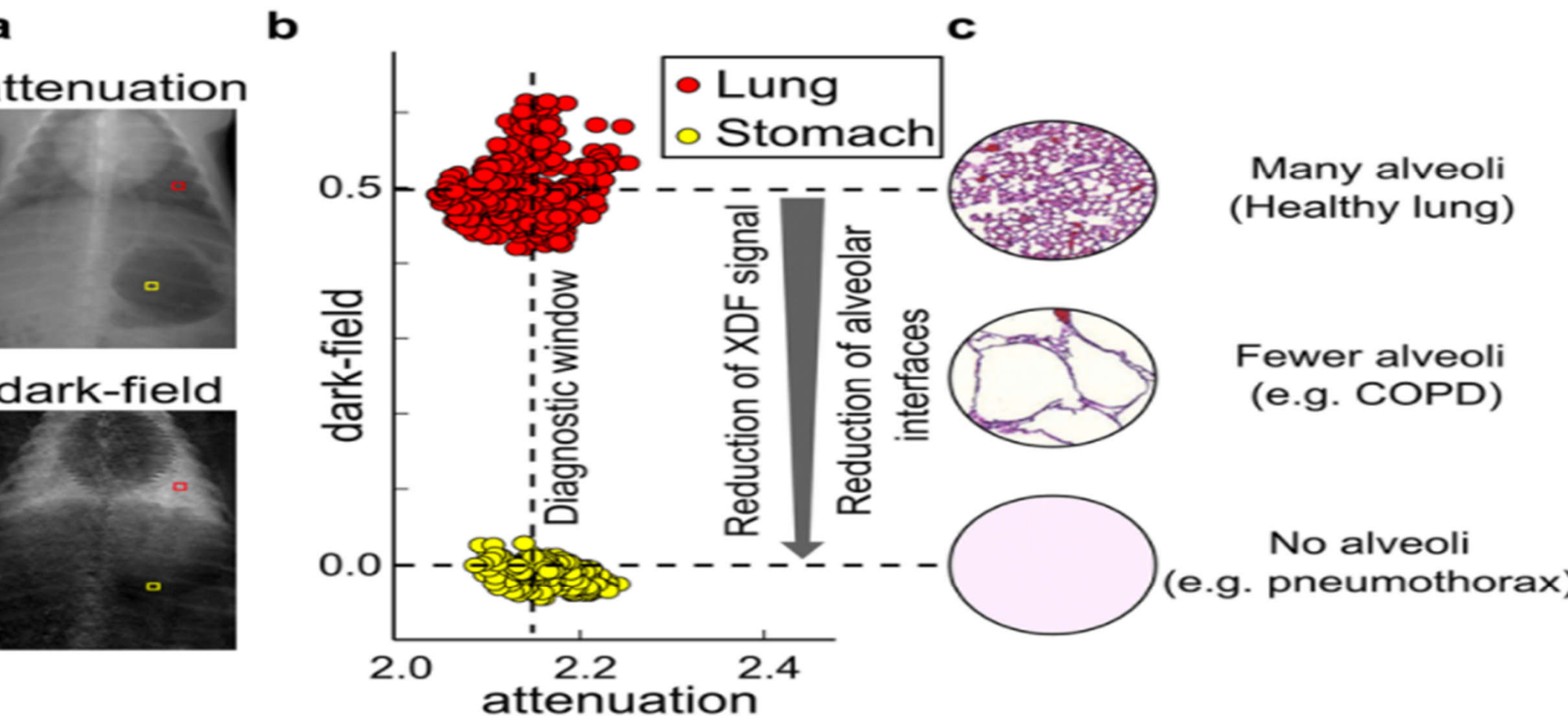


Figure 1: In-vivo porcine multi-contrast chest radiographs. Attenuation (a,b), X-ray dark-field (c,d) and differential phase contrast (e,f) chest radiographs of a healthy, living pig in posteroanterior (PA) (top row) and lateral (LAT) view (bottom row). Both scans were conducted using imaging parameters compliant with animal care, namely 40 seconds total scan time and a radiation dose of approximately 80 μ Sv. In particular the XDF radiographs (c,d) allow for an easy and unambiguous assessment of the pig lung, since overlying structures (e.g. fat) present negligible scattering, and the XDF signal strength is correlated to the number of alveolar interfaces. Please note that images a-d are displayed as the neg. natural logarithm of relative transmission and visibility loss respectively.



potential of XDF imaging. (a) Two regions of interest with similar attenuation signals but different XDF behavior showcase the diagnostic potential of XDF imaging. (b) Scatterplot comparing healthy lung tissue (red) with intact alveolar interfaces and a strong XDF signal vs. the air-filled stomach (yellow) with no internal microstructure, and thus a small XDF value. As the XDF signal strength is directly correlated to the number of alveolar interfaces, a loss of the latter due to respiratory diseases, as indicated in the example of histopathological slices in (c), can be diagnosed even if the attenuation signal remains unaltered. The diagnostic window ranges up to the point where no alveoli are left, which is the case e.g. in a pneumothorax. For this extreme case, the air-filled stomach is considered only as a demonstrative model here.

Researchers built a multicontrast chest x-ray system that can provide conventional absorption contrast, differential phase contrast, and dark-field x-ray images in a single acquisition. They implemented several technical innovations to achieve data acquisition of the entire chest with a coverage of 28 cm in the superior-inferior direction within four seconds. Initial imaging tests were performed using a chest phantom.

Estimated air kerma and effective dose were well below the effective dose for a standard chest x-ray and the quality of the absorption contrast images matched standard chest x-rays, the group found.

"A new prototype multicontrast [chest x-ray] system was developed to enable low radiation dose and fast scans of human chest-sized objects within four seconds," the researchers and colleagues noted.

Attend this session to learn the details.

The paper received a Roadie 2021 award for the most popular abstract by page in this Road to RSNA section.



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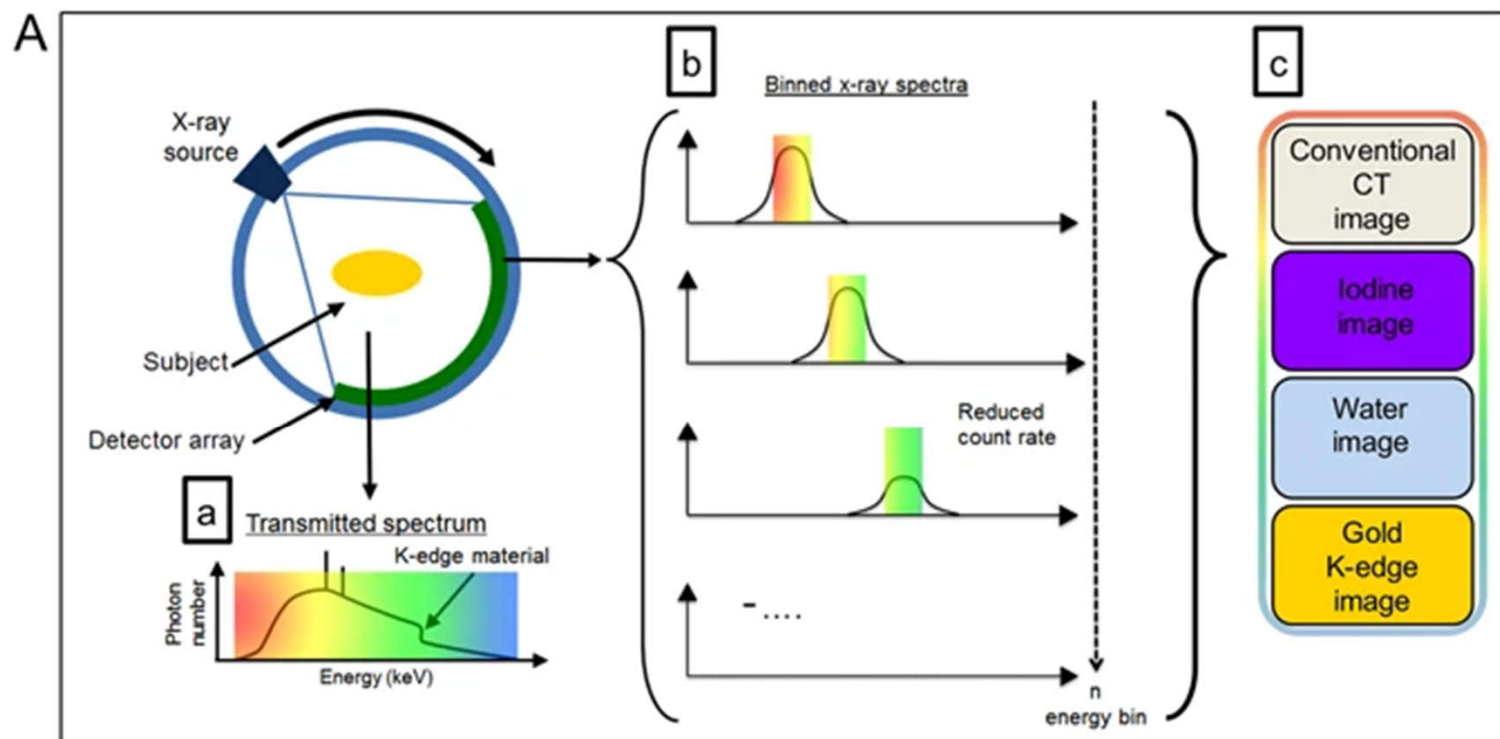
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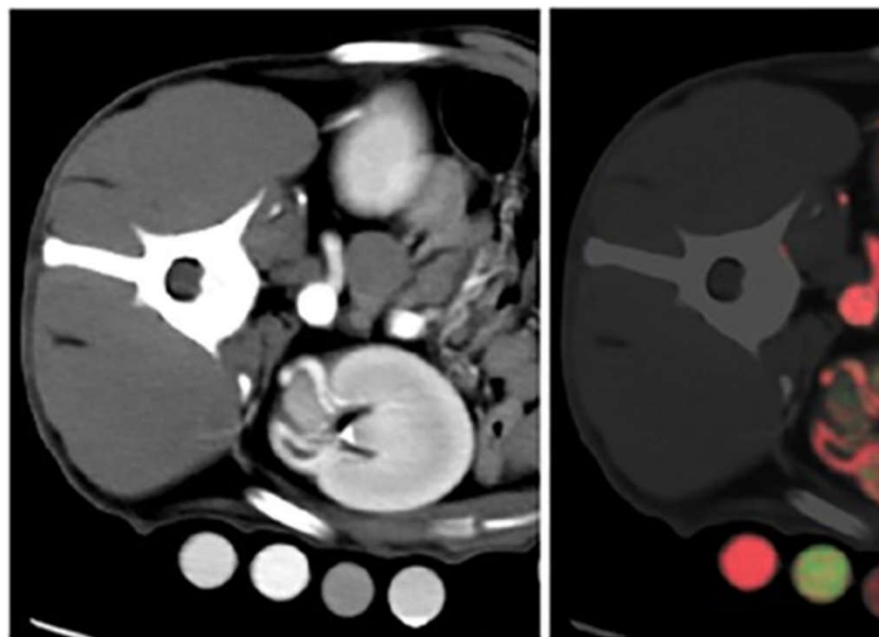
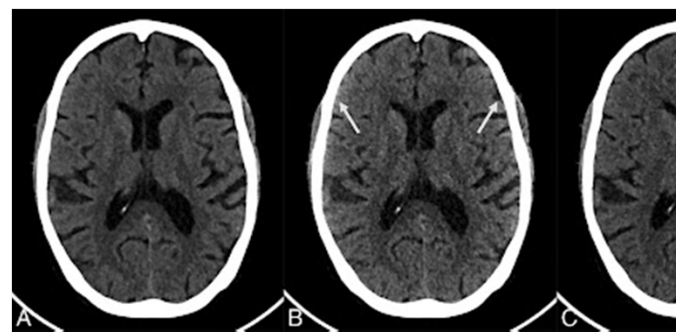
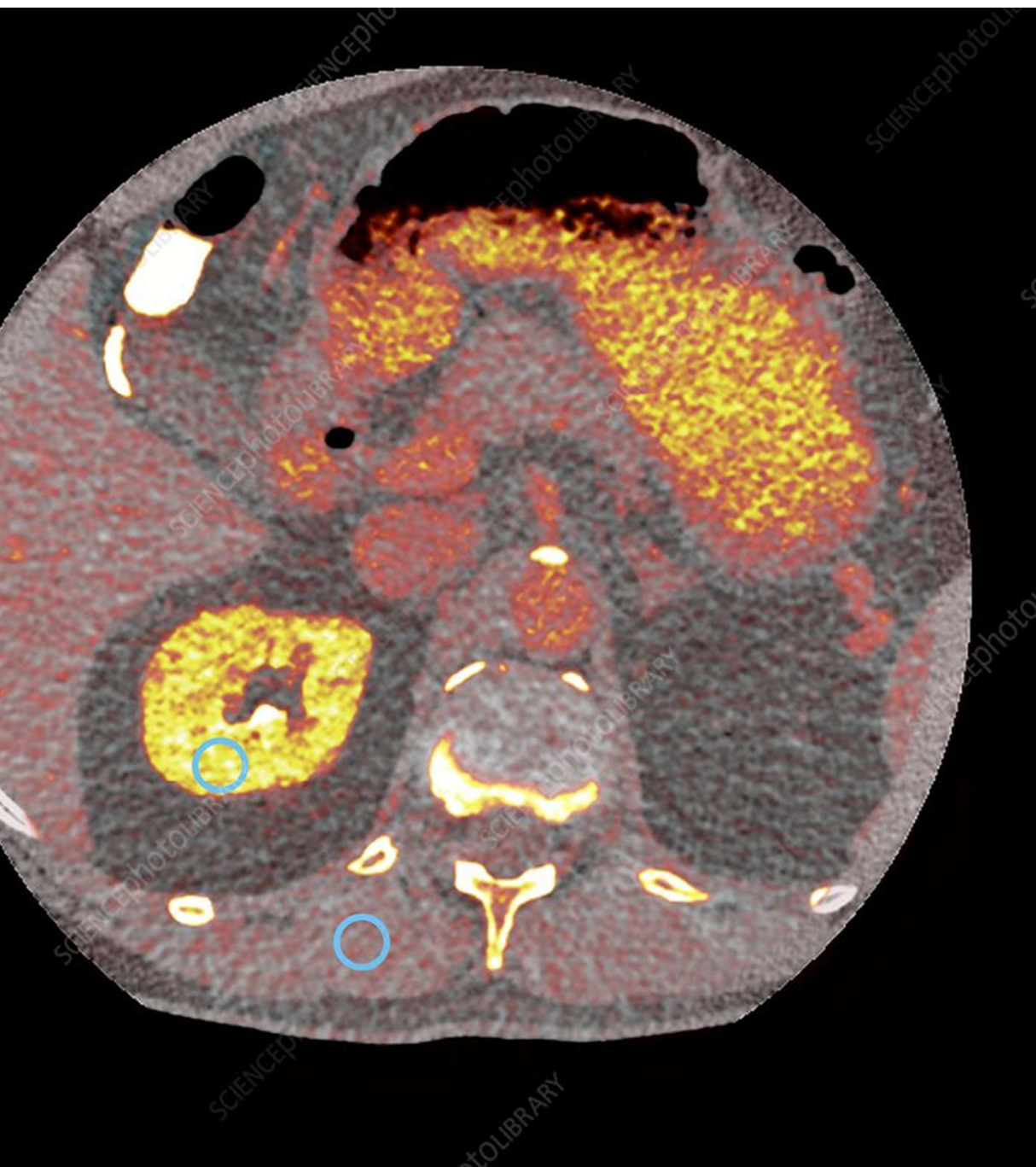


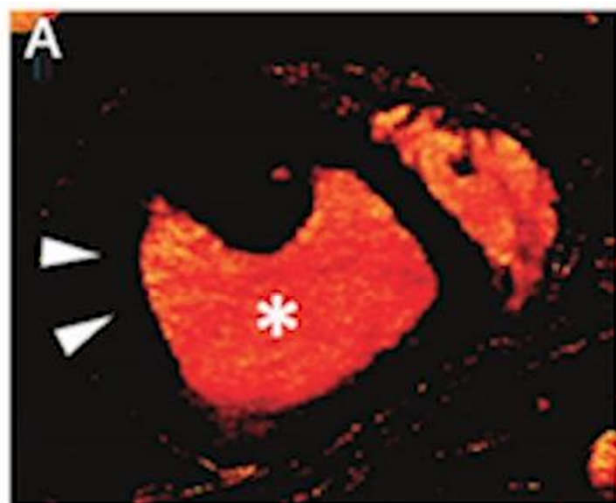
Photon-counting CT shows promise for better diagnostic performance

AuntMinnie.com staff writers

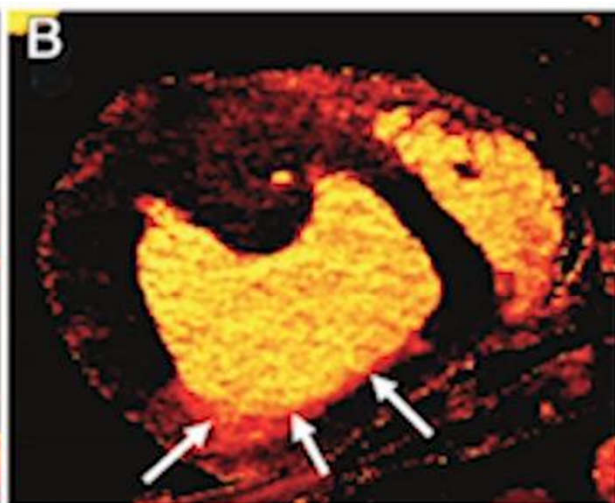
September 28, 2021 -- Photon-counting CT shows promise for better diagnostic performance compared to conventional CT, according to research presented on Tuesday at the RSNA 2021 meeting.



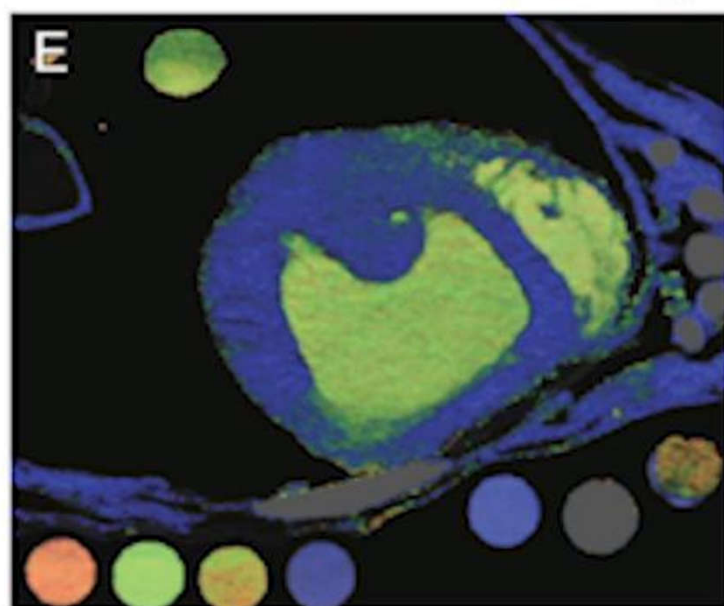
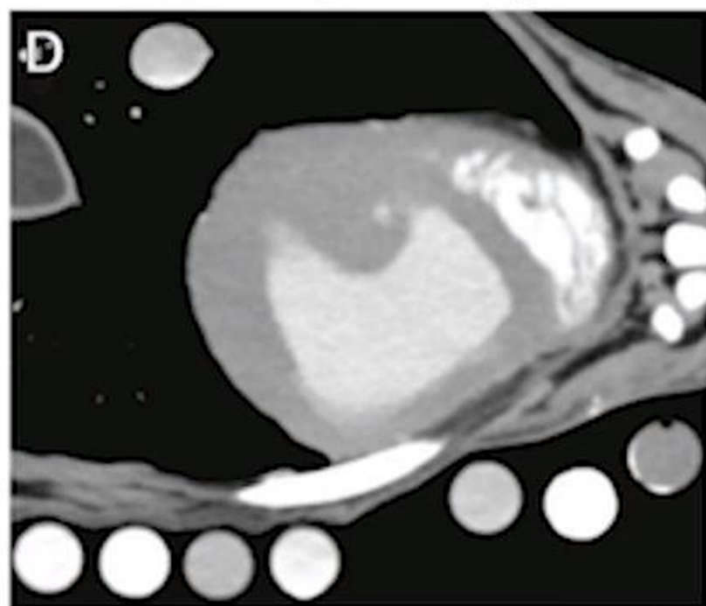




PCD Grayscale Image



Multi-Material Concentration Map



- Iodine
- Gadolinium
- Iodine / Gadolinium mixture
- Non-contrast material
- Calcium

It has the potential for better contrast and noise performance compared to scintillator-based energy integration detector [CT]," presenter Richard Thompson, PhD, of Canon Medical Research Institute USA in Vernon Hills, IL, told session attendees.

Thompson and colleagues conducted a study using a phantom to compare image quality between a prototype photon-counting CT device and a conventional CT system, analyzing for noise, spatial resolution, and accuracy.

The photon-counting prototype was based on a Canon Aquilion One Vision system. Its smallest detector pixel size is 342 μm ; each pixel produces measurements of up to six energy bins starting from 20 keV, Thompson said. (Photon-counting detectors generate energy-specific images that are assigned to energy bins in small ranges.)

The investigators scanned a 40-cm water phantom and Sun Nuclear's Gammex multienergy phantom with both the photon-counting prototype and the conventional scanner, comparing both counting and spectral images. The photon-counting CT device produced images with 20% to 25% reduced noise compared to conventional CT and had higher spatial resolution, from 0.60 lp/mm for conventional CT to 0.69 lp/mm for the photon-counting device.

"The initial performance of this prototype photon-counting CT system in both counting and spectral imaging modes demonstrates its potential to achieve better diagnostic performance with reduced dose," Thompson concluded.



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Progress made, but more needed for diffusion-weighted breast imaging

Erigo Allegretto, AuntMinnie.com staff writer

October 1, 2021

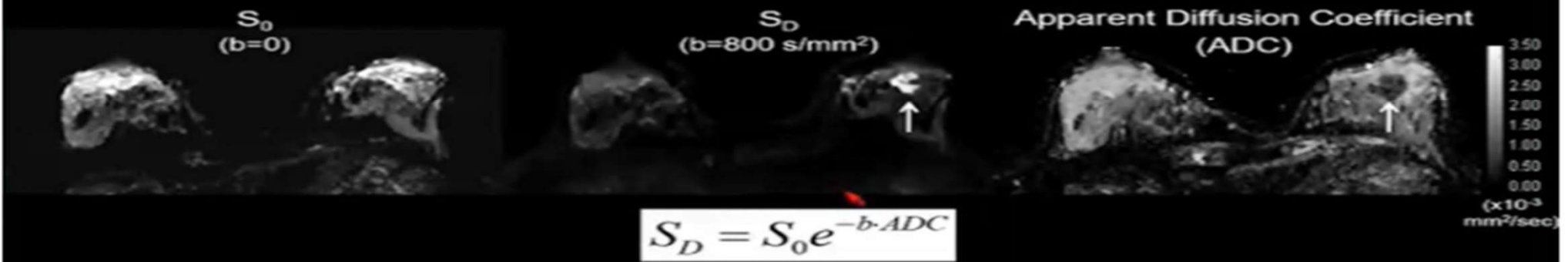
Diffusion-weighted imaging has made strides in research on its way to being used in clinical settings for diagnostic and therapeutic use in breast imaging, but more work is needed, according to a talk given December 1 at the RSNA annual meeting.

In her keynote presentation, Savannah Partridge, PhD, from the University of Birmingham touted this imaging method's potential for classifying breast lesions, evaluating response to therapy, and not using contrast agents to detect cancers.

"Diffusion-weighted imaging can generate a wealth of information related to tissue microstructure," Partridge said. "It's already shown clinical value for multiple applications for breast imaging."

Diffusion-weighted imaging uses diffusion-sensitizing gradients during image acquisition for radiologists to measure water motion. For breast imaging, malignancies show restricted diffusion on diffusion-weighted imaging compared with normal breast tissue, presenting as bright spots.

Breast DWI



- Breast malignancies exhibit restricted diffusion on DWI compared to normal breast tissue

Malignancies present as bright spots on diffusion-weighted imaging due to showing restricted diffusion. Researchers say this imaging method could serve as an alternative to dynamic contrast-enhanced MRI, though more studies and standardization are needed. Image courtesy of Dr. Savannah Partridge.

is this common characteristic of malignancies that make it [imaging] value for fast imaging," Partridge said.

While progress has been made in this technology over the past 20 years, it has not been established as a routine clinical technique.

In previous studies, one of which Partridge led in 2018, have shown that malignancies detected by diffusion-weighted imaging have lower apparent diffusion coefficient (ADC) values than benign lesions. Partridge and colleagues also suggested that DWI could improve specificity and positive predictive value of conventional breast MRI.

es have also shown diffusion-weighted imaging's promise in evaluating response to neoadjuvant therapy by showing alterations in cell membrane integrity and reduced cell density, leading to increased water mobility in the tumor environment.

Partridge led another study in 2018 showing that midtreatment ADC was more predictive of pathologic complete response than changes in tumor size shown by dynamic contrast-enhanced MRI. Tumor ADC has also shown repeatability in test-retest scenarios.

Partridge also noted diffusion-weighted imaging's potential use as an alternative breast contrast screening method. One study Partridge cited from 2019 that compared diffusion-weighted imaging with dynamic contrast-enhanced MRI showed the former had an average sensitivity of 72% and a specificity of 90%.

"It is not yet reaching the performance of dynamic contrast-enhanced MRI, but it's quite promising for a technique that has not been fully optimized for this application," Partridge said.

The current research effort Partridge noted is being performed by South Korean researchers. The team is enrolling women into the prospective multicenter trial, which aims to compare diffusion-weighted imaging with other breast screening methods.

really look forward to their results to help shed more light on the value of diffusion-weighted imaging for this application," Partridge said.

However, one barrier preventing this imaging method from being used routinely in clinics is the lack of standardization. This has limited researchers in terms of defining diagnostic criteria and integrating diffusion-weighted imaging into BI-RADS and other guidelines.

However, efforts are being made by groups in Europe and the U.S., including the EUSOBI International Breast Diffusion-Weighted Imaging working group and the ACR's Quantitative Imaging Biomarkers Alliance.

Partridge also said more multicenter studies are needed to further validate this method and evaluate its real-world applications, with emerging image acquisition techniques seeking to expand its utility and role in breast imaging.

There's still exciting things to come," she said.



Ấn Độ: Một bệnh nhân sau khi chụp X-Quang đã thấy trong cơ thể có 1 con gián, bác sĩ khuyên anh đi nước ngoài thực hiện phẫu thuật lấy nó ra. Sau khi qua Singapore, bác sĩ bảo với anh rằng: "**Trong người anh không có con gián nào cả, nhưng cái máy chụp X-Quang ở nước anh thì có đấy**".

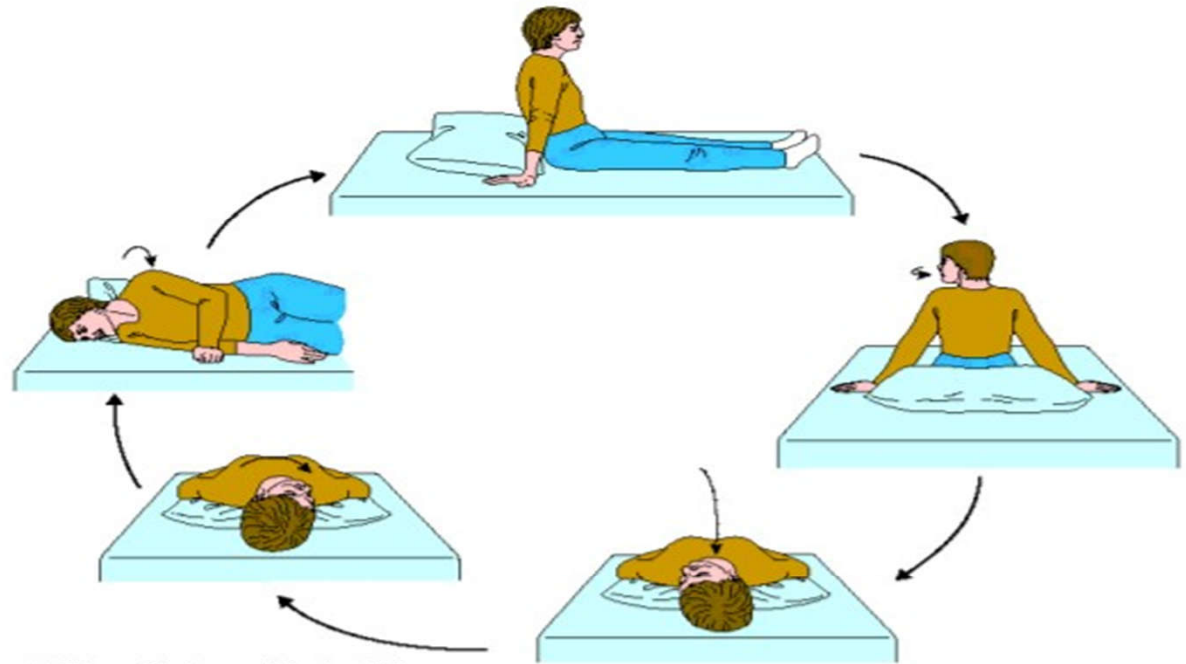
Epley Maneuver for Benign Positional Vertigo

Overview

Paroxysmal positional vertigo (BPPV) is one of the most common causes of vertigo — the feeling that you're spinning or that the inside of your head is spinning.

It causes brief episodes of mild to intense dizziness, often triggered by specific changes in your head position. This might occur when you tip your head back, when you lie down, or when you turn your head to sit up in bed.

BPPV can be bothersome, it's rare, but it can increase the chance of falls. There is an effective treatment for BPPV during a doctor's office visit.



(c) Chicago Dizziness and Hearing, 2007

1. Lie down on your back, turn head to left for 1 minute
2. Then turn head to right for 1 minute
3. Turn whole body to right, head facing towards floor for 1 minute
4. Sit up slowly, head tilted forward for 1 minute

If above does not work to relieve nausea and dizziness, try:

1. Lie down on your back, turn head to right for 1 minute
2. Then turn head to left for 1 minute
3. Turn whole body to left, head facing towards floor for 1 minute
4. Sit up slowly, head tilted forward for 1 minute

ear and balance

ear and balanceOpen pop-up dialog box

there's no known cause for BPPV. This is called idiopathic BPPV.

there is a known cause, BPPV is often associated with a minor to severe blow to the head. Less common causes of BPPV include disorders that damage your inner ear, damage that occurs during ear surgery or long periods positioned on your back, such as in a dentist chair. BPPV also has been associated with migraines.

your role

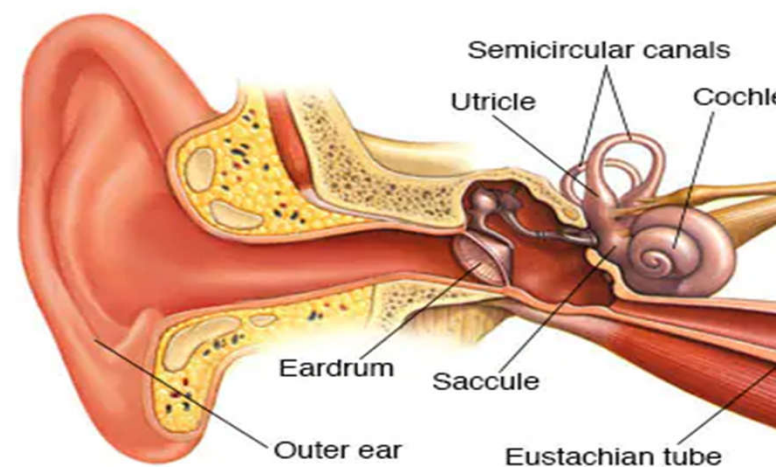
Your ear is a tiny organ called the vestibular labyrinth. It includes three loop-like structures (semicircular canals) that contain fluid and fine, hairlike sensors that detect your head's rotation.

Otolith organs (otolith organs) in your ear monitor your head's movements — up and down, right and left, back and forth — and your head's position related to gravity. Otolith organs contain crystals that make you sensitive to gravity.

For many reasons, these crystals can become dislodged. When they become dislodged, they can move into one of the semicircular canals — especially while you're lying down. This causes the semicircular canal to become sensitive to head position changes that normally not respond to, which is what makes you feel dizzy.

Factors

Paroxysmal positional vertigo occurs most often in people age 50 and older, but it can occur at any age. BPPV is also more common in women than in men. A head injury or another disorder of the balance organs of your ear may make you more susceptible to BPPV.



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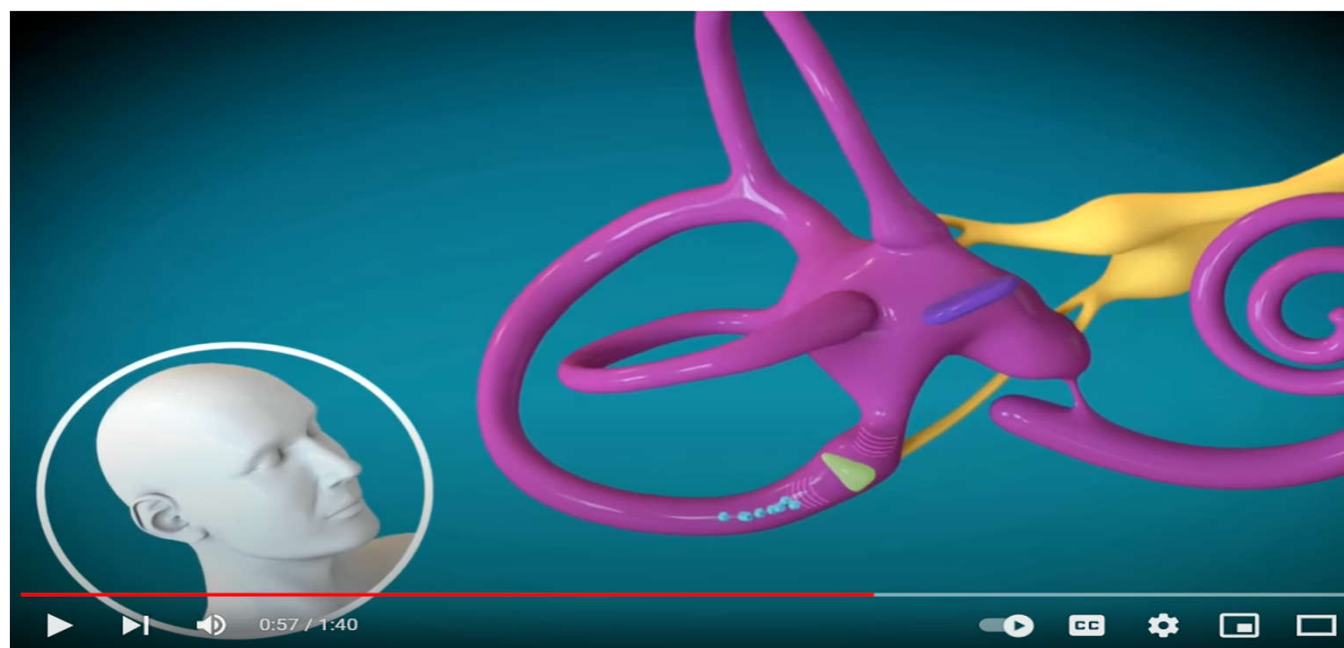


Fig 3.

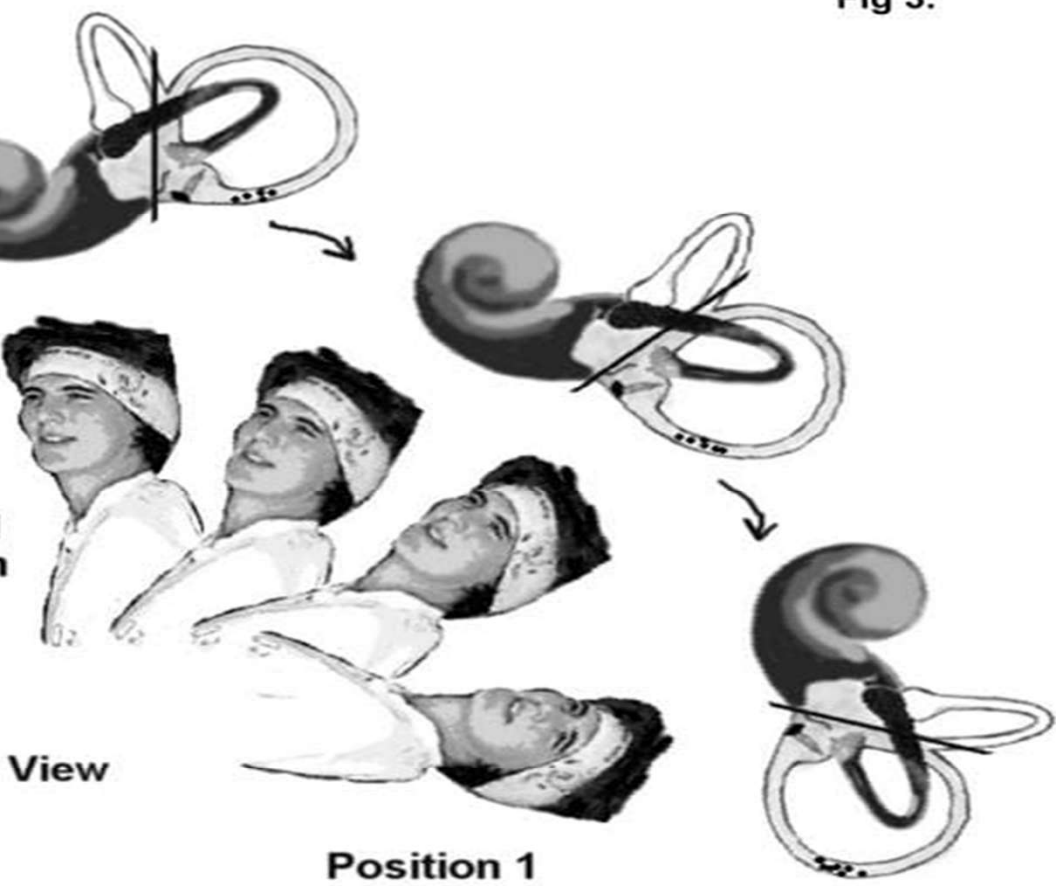


Fig 5

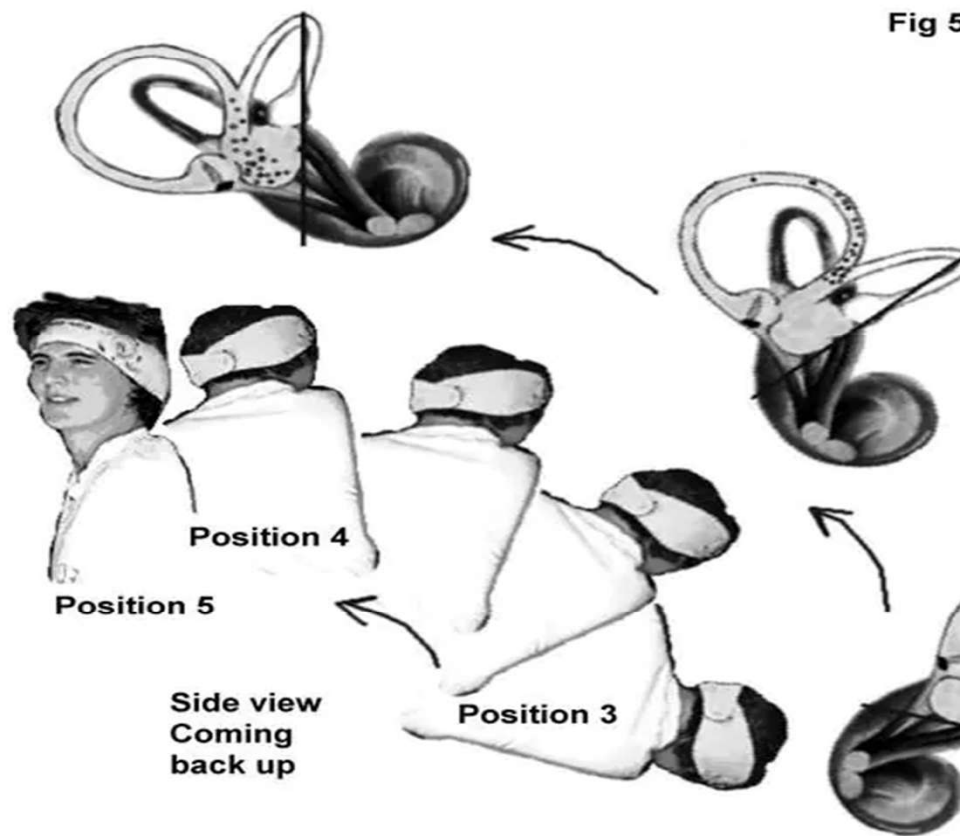
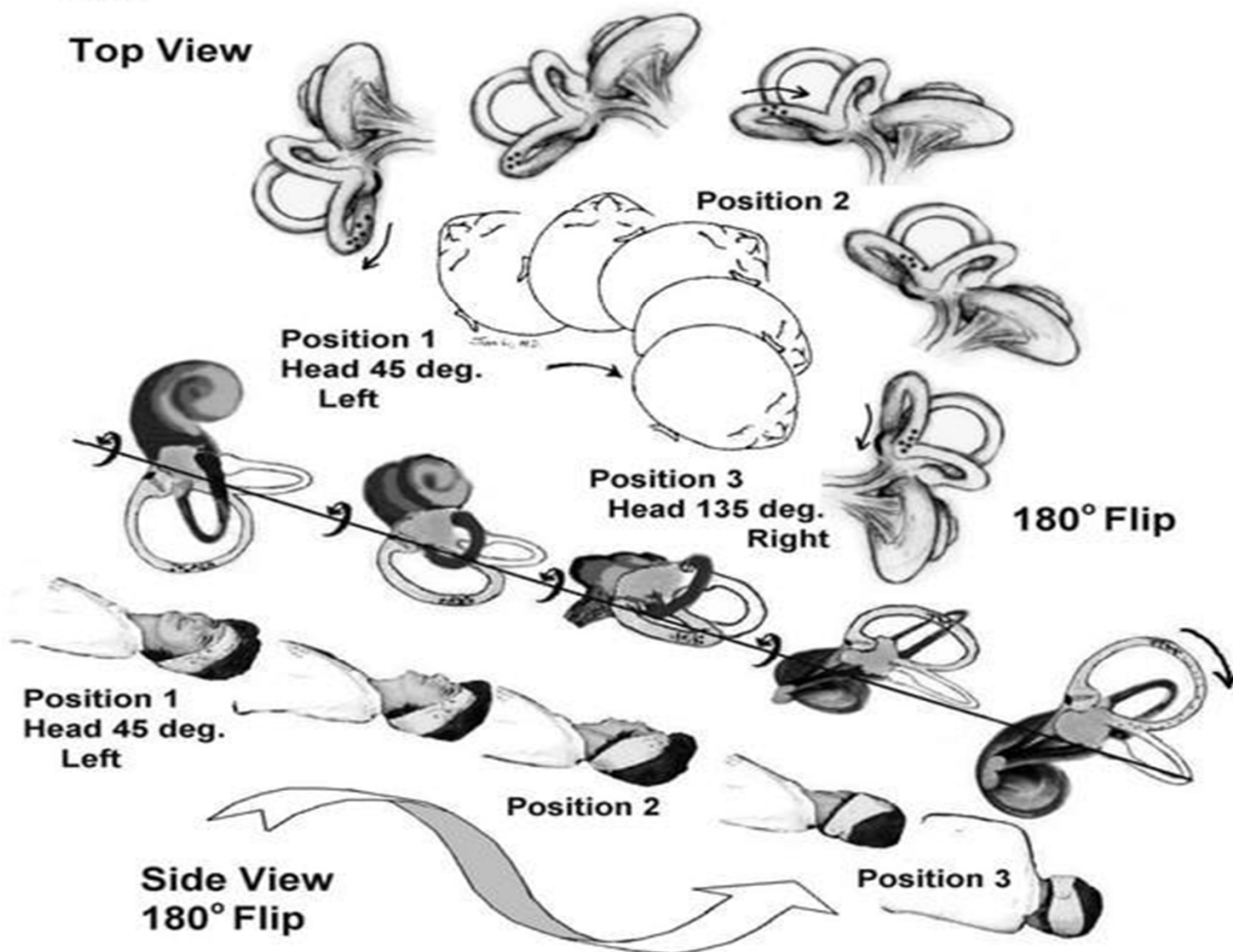


Fig 4.

Top View



Dix-Hallpike maneuver is the standard clinical test for BPPV. The finding of classic rotatory nystagmus with latency and limited duration is considered pathognomonic. A negative test result is meaningless except to indicate that active canalithiasis is not present at that moment.

The test is performed by rapidly moving the patient from a sitting position to the supine position with the head turned 45° to the right. After waiting approximately 20-30 seconds, the patient is returned to the sitting position. If no nystagmus is observed, the procedure is then repeated on the left side.

Dix-Hallpike maneuver tips include the following:

- Do not turn the head 90° since this can produce an illusion of bilateral involvement.

- Vary the briskness of the Dix-Hallpike test to the individual patient.

- Consider the Epley modification. From behind the patient, performing the maneuver is easier, since one can pull the outer canthus medially and laterally to visualize the eyeball rotation.

- In typical nystagmus, the axis is near the undermost canthus. Minimize suppression by directing the patient gaze to the anticipated axis of rotation.

- Classic posterior canal BPPV produces geotropic rotatory nystagmus. The top pole of the eyes rotates toward the undermost (affected) ear.

- Purely horizontal nystagmus indicates horizontal canal involvement.

- Sustained or nonfatiguing nystagmus may indicate cupulolithiasis rather than canalithiasis.

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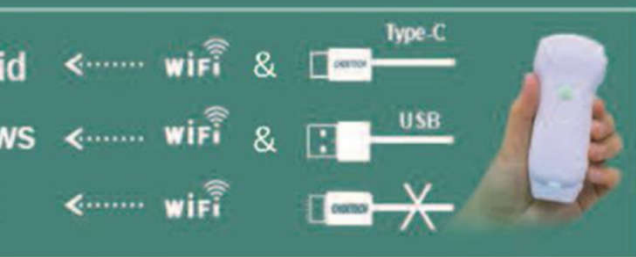
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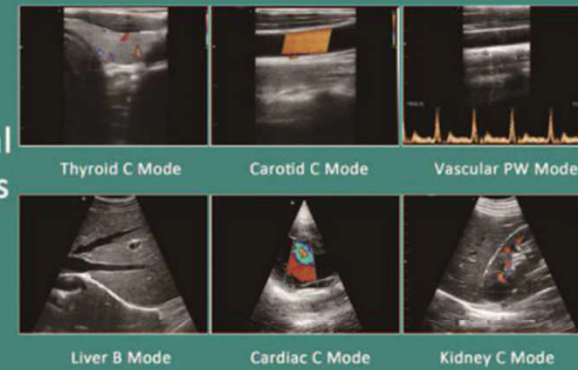
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