INTERNET NEWS

BS. Hồ Chí Trung

Patients with tumours in sensitive areas can now be treated with proton beam therapy in Singapore

Mount Elizabeth Novena Hospital received the first licence in Singapore to offer proton beam therapy. PHOTO: IHH SINGAPORE

APORE - An 18-year-old woman from the United Arab Emirates will becon
patient in Singapore to receive state-of-the-art proton beam therapy to shrink
ants of a cancer tumour in her nose. Her treatment will start this week.

a two-year delay, largely due to the Covid-19 pandemic, Singapore's first pr
system is finally operational.

Ionday, Mount Elizabeth Novena Hospital (MNH) became the first healthcar
ution here to receive the licence to operate this multimillion-dollar system.

others, the National Cancer Centre Singapore (NCCS) and the Singapore Inst
vanced Medicine Holdings (SAM), are waiting to obtain their licences to sta
ar treatment.

proton beam machine costs between $80 million and $100 million. The one
S is the most expensive as it will have four gantries – each containing a large
et to focus and direct the beam – for patients and one for research, while the
ms at the other two locations have one gantry each.

vailability of proton therapy here is great news for patients who have cancers
ed in sensitive areas such as the head or the neck.

logists here will no longer need to send their patients to Taiwan or South Ko
ch treatment. Thailand has also had proton therapy since early last year, but
currently restricted to Thai nationals.

proton therapy is no better at killing cancer cells or shrinking tumours than
ntional radiotherapy, it causes significantly far less damage to surrounding he
and organs.

because with proton therapy, the beam stops where the tumour is. With
ntional radiotherapy, the beam that destroys the cancerous cells goes all the w
h the body, causing damage along its path.

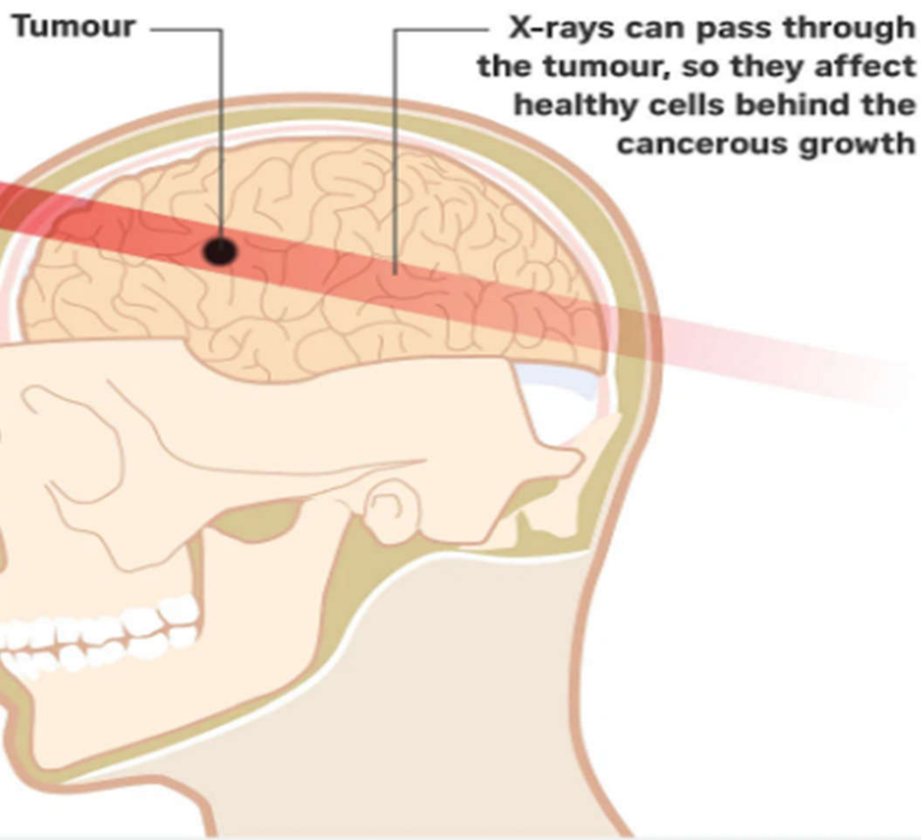
radiation oncologist Lee Kuo Ann explained: “Proton particles stop in the tu
not expose normal tissues on the other side of the tumour to radiation.”

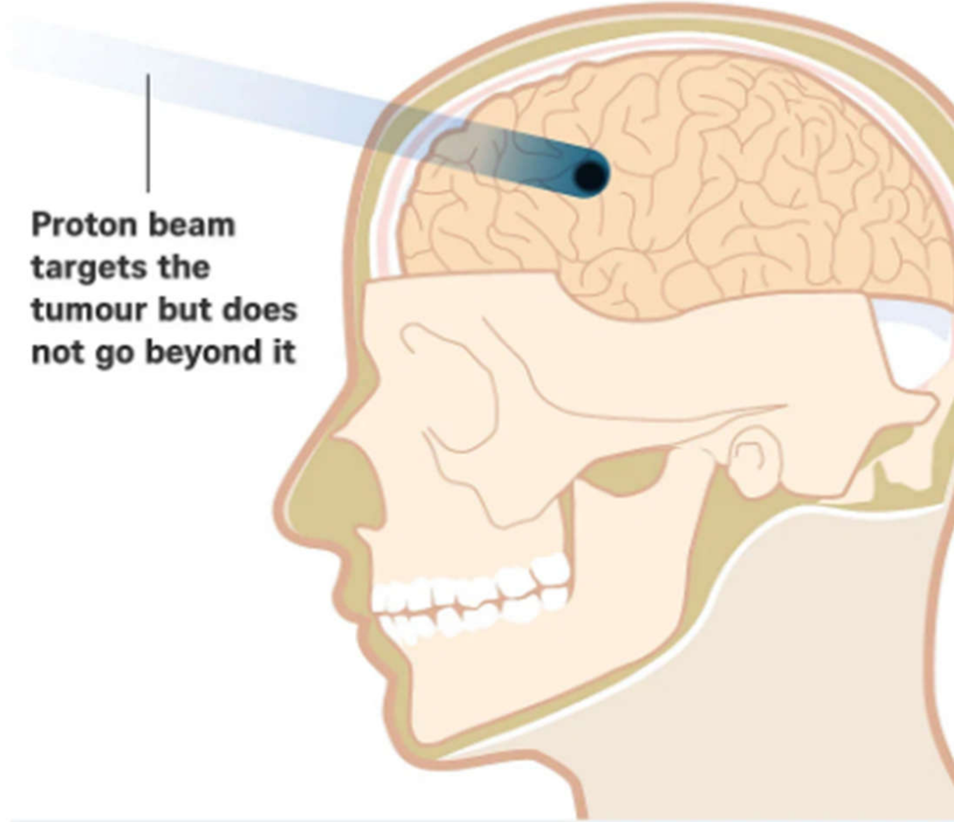
hould reduce side effects, he said, and will reduce growth and developmenta
in children and young adults.

d the woman from the UAE, Ms Fatema Khilfa, is a good candidate for proto
y, given the location of the tumour. She has been successfully operated on an
eeds radiotherapy to reduce the risk of the cancer recurring.

proton beam instead of conventional radiotherapy “should reduce the severit
taste, mouth ulcers and dry mouth”, said Dr Lee, adding that it also reduces
risk of radiation-induced cancers.

s versus proton beam for tumour treatment





AYS

-ray radiation targeting the tumour is of a high
at the point of entry and reduced as it goes
gh the body. This means that the radiation is
r entering the body and lower when it exits.

PROTON BEAM

Protons accelerated to 70 per cent the speed of light enter the body. As they slow down at the site of the tumour, they release their energy in it. The beam of protons does not go beyond the tumour. This means that healthy cells in front of the tumour get a low dos while those behind it get no radiation.

s chief operating officer Paul Yeo said there is much less collateral damage from rad
nal tissue. “When protons enter the body, they do so with very little dose deposition
rance region, but will deposit all of their energy (dose) over the tumour target. Ther
e beyond the target.”

IH, treatment will usually be carried out five days a week for up to eight weeks. Ea
lasts about 30 minutes – although the actual radiation takes only five minutes – be
need for precise positioning. Treatment is usually painless, and patients can resume
l activities after each session.

e added benefit comes with a hefty price tag.

er Chow, MNH’s chief executive officer, said proton beam will cost two to 2.5 time
f conventional radiotherapy.

nent will cost about $60,000 to $70,000 at MNH. But Dr Lee said: “The reduction i
may translate to cost savings in managing the side effects of radiation.”

M, proton beam therapy will cost about three times the price of conventional treatm
r Yeo.

one reason the Ministry of Health has restricted the types of cancer that proton bea
d to treat. Aside from tumours in the head and neck, proton beam can also be used
rostate cancer. In patients below the age of 25, it can also be used for spinal and pel
s.

is also a list of criteria for MediShield Life coverage, one of which is where t
cted rate of severe side effects from other treatments is unacceptable".

ated Shield Plans provide varying cover for proton beam therapy, with the
num capped at $100,000 a year.

s Dr Chow said his hospital will be "benchmarking treatment prices competi
t other centres in the region". His centre has the capacity to treat up to 500 pa

MNH and SAM expect a mix of local and foreign patients.

s hoping to receive its licence to operate proton beam therapy within the mon
ave patients, including children, waiting from Singapore as well as overseas,
id.

beam therapy is particularly important for children with cancer in the head a
duce possible damage to the brain, eyes and ears, he added.

ntre expects to treat 24 to 28 patients a day once it starts.

s director of proton therapy is Dr Robert Malyapa, who has nearly 20 years o
l experience in treating both adults and children with proton therapy in the U
and Switzerland, Mr Yeo said.

CCS said it will share details of its plans for proton therapy after it receives t
e.

T for lung cancer screening also can assess CAC

e Madden Yee, AuntMinnie.com staff writer

5, 2023 -- Lung cancer screening with low-dose CT (LDCT) -- specifically photon-
ng CT (PCCT) -- offers an opportunity to assess a person's coronary artery calcific
 according to a presentation delivered at the ARRS meeting in Honolulu.

LDCT to identify and track two diseases at once makes patient care more effective
ter Tyler Cook of Virginia Commonwealth University.

ose CT for lung cancer screening provides opportunity to scan for two diseases [a
she explained.

vascular disease is the number one killer of both men and women, not only in the
o around the world. Smokers are two to four times more likely to develop heart dis
onsmokers, and more than six times more likely to suffer a fatal heart attack than
okers, according to Cook.

ary artery calcification is a strong independent predictor of coronary artery diseas
major adverse cardiac events," she said. "CAC increases with tobacco use and CA
ses mortality."

am compared PCCT to invasive coronary CT angiography (CCTA) for the evaluatio
is. (CCTA is the first-line method for evaluating coronary artery disease, but it does
ency to overestimate coronary stenosis, Cook explained. PCCT offers higher imag
 and better spatial resolution and contrast-to-noise ratio, which translates into more
te assessment.)

ought to investigate whether there was a relationship between the total qualitative C
and/or the left main CAC score and total cumulative pack years of smoking," she s
oted that the presentation was aimed at radiology residents, radiologists participati
ancer screening programs, internal medicine and primary care physicians, and
ogists.

udy included 41 patients and 984 lung cancer screening scans taken
en 2013 and 2021. Patients underwent both PCCT and invasive coron
raphy; the PCCT images were processed with virtual monoenergetic
g reconstructions to explore the accuracy of stenosis measurements
using PCCT.

erage, cumulative pack years among the study cohort were 50. Most
ts were white and 60% were current smokers. Cook's team tracked ag
ody mass index (BMI), smoking status, and pack years.

oup found a statistically significant difference between total CAC scor
mulative pack years smoked, as well as a statistically significant diffe
en the left main coronary artery CAC score and cumulative pack years
d.

und a direct correlation between total cumulative pack years of tobac
tal qualitative coronary artery calcium score and left-main coronary ar
n score," Cook said.

udy shows that PCCT improves the accuracy of CCTA stenosis
rements, she concluded.

l monoenergetic imaging reconstructions have potential to improve
cy of stenosis quantification on PCCT CCTA," she said.

neumonia patterns on chest x-rays may underlie viral infection

y Will Morton, AuntMinnie.com staff writer

7, 2023 -- Expanding criteria for diagnosing pediatric pneumonia on chest x-rays t
e patterns observed in both lungs could help guide better use of antibiotics in child
ing to a study presented at the American Roentgen Ray Society (ARRS) annual
g in Hawaii.

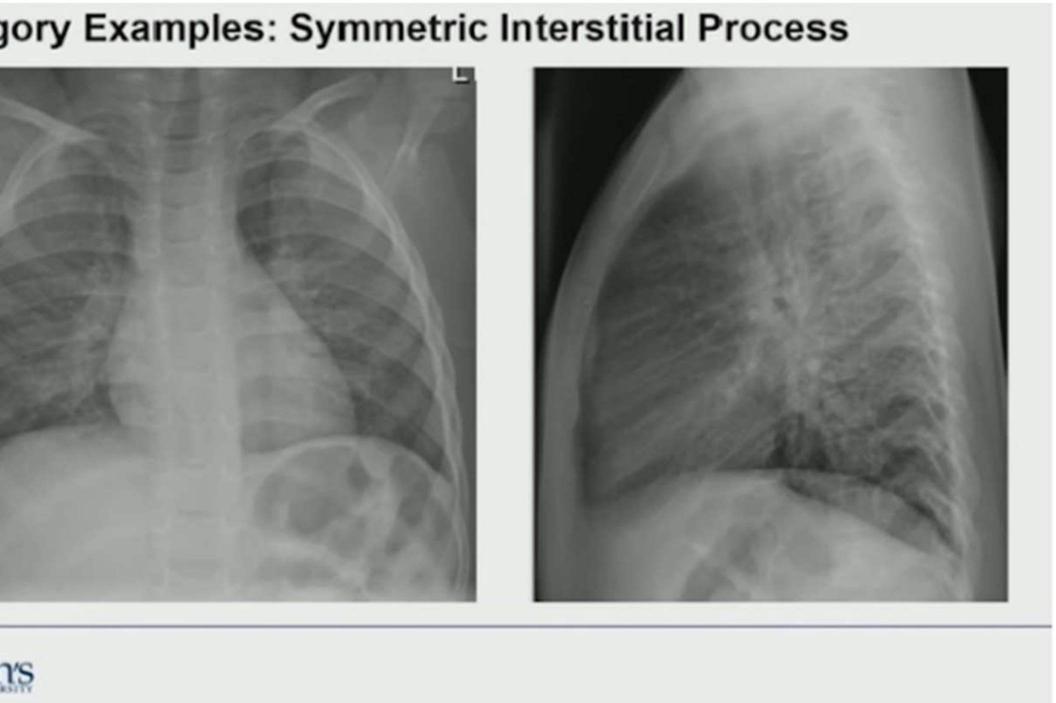
ssion on pediatric imaging, Dr. Michael Kurtz of Queen's University in Toronto, On
ted a multicenter study that found that including x-ray signs of bilateral patterns of
es could help identify more cases caused by viruses than bacteria.

ropriate antibiotic use is rampant in children presenting with pneumonia, and this
utes to an increase in drug resistance," Kurtz said.

ing to the U.S. Centers for Disease Control, an estimated 70% of pneumonia case
are caused by a virus versus 30% of cases caused by bacteria. Previous studies
st that asymmetric patterns on radiographs are associated with bacterial processe
ng antibiotic treatment, while symmetric patterns are associated with viral process
noted.

er, current guidelines, including the World Health Organization's criteria for diagno
onia in children using x-rays, are not specific regarding associations with asymme
mmetric patterns, he added.

study, the researchers aimed to further establish the clinical importance of these
ations. They reviewed 978 chest x-rays from children under 6 years old suspected
onia who underwent imaging at two emergency departments between 2017 to 20
ediatric radiologists interpreted the exams based on five patterns: normal, symmet
tial, asymmetric interstitial, asymmetric airspace, and mixed. Extensive clinical dat
btained, including the identified organism involved, and the researchers then corre
with the chest x-ray patterns.



Dr. Michael Kurtz of Queen's University in Toronto, Ontario, presented a study showing that symmetric patterns of lung infiltrates on chest x-rays can help identify viral cases in children. Image courtesy of Dr. Kurtz.

to the readings, 42% of the chest x-rays were normal, 19% were interpreted as symmetric interstitial, 10% as asy 18% as asymmetric airspace, and 11% as mixed.

sis revealed that respiratory syncytial virus (RSV)-positive cases had normal interpretations in 20%, symmetric int 46%, asymmetric interstitial patterns in 16%, and mixed pattern in 19% ($p < 0.001$). There were no known RSV c ting an asymmetric airspace pattern in the study, Kurtz noted.

bution of pneumonia patterns in our study, including the group with known RSV, mirrors the epidemiology literatur expected incidence of viral versus bacterial versus mixed infectious pneumonic processes," Kurtz said.

a typical viral process should result in a more diffuse pneumonic process visible on chest x-rays compared with a said. Moreover, a significant percentage of viral pneumonias will have normal radiographs, which in any case sh t antibiotic use, while patients with asymmetric interstitial patterns on chest x-rays understandably may receive a he suggested.

this observation will help support the physician's decision not to prescribe antibiotics for the child with pneumonia

tal chest x-ray technique improves detection of lung lesions

ill Morton, AuntMinnie.com staff writer

), 2023 -- Adding bone-suppression functions to digital chest x-ray exams can assist doctors with th
of subtle pulmonary lesions, according to a research group in Japan.

hers at the University of Occupational and Environmental Health in Fukuoka found that sing bone artifacts on temporal subtraction (TS) digital chest radiographs significantly impro valuation of pulmonary lesions. The study is the first to demonstrate the clinical usefulness n in patients, the authors wrote.

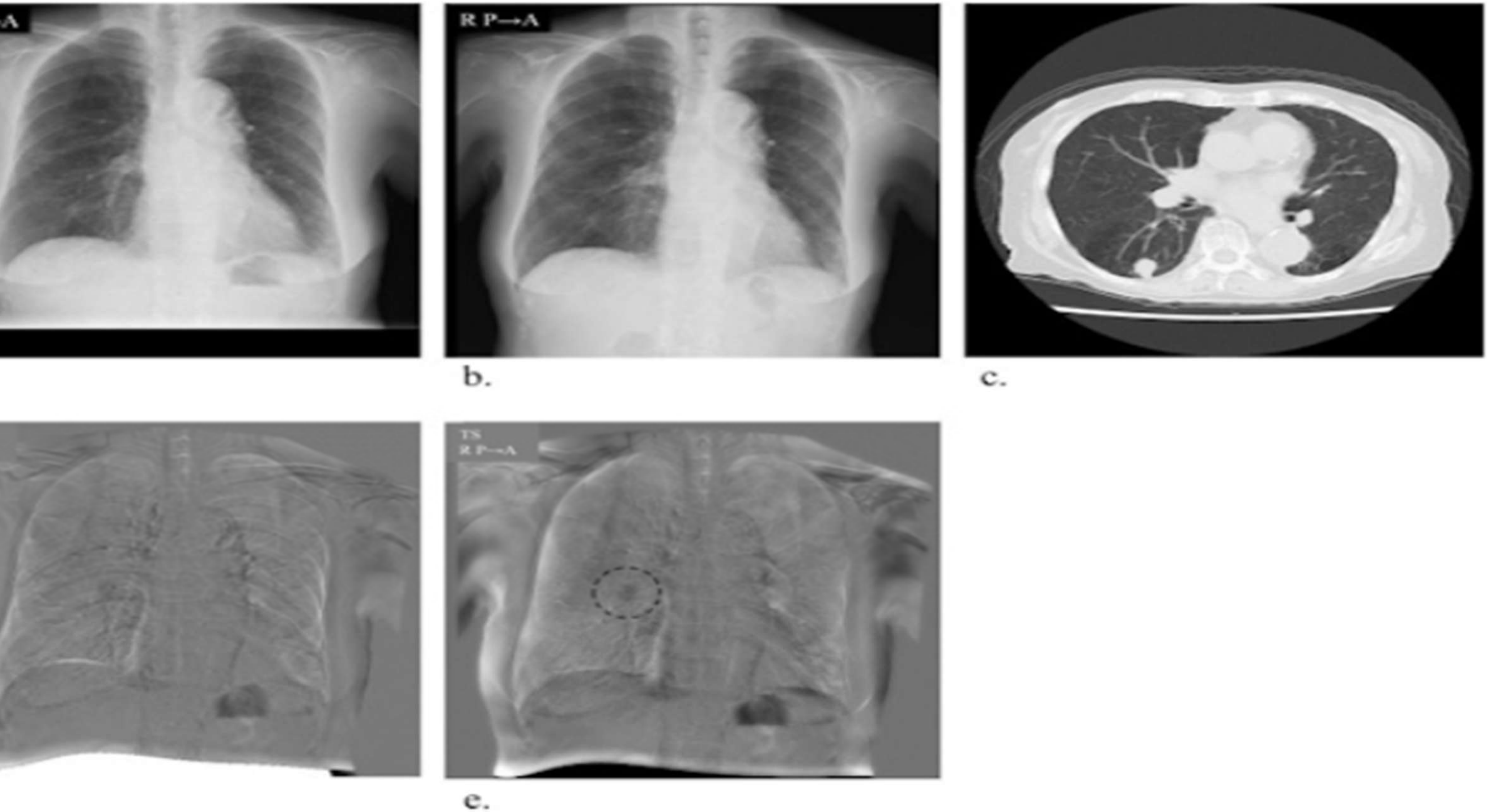
dy demonstrated that [bone suppression]-TS processing can reduce rib and clavicle artifac method can assist in thedetection of subtle pulmonary lesions in digital chest radiography, ad author Takeshi Takaki, PhD, and colleagues. The study was published online January 1 *n*.

g digital chest x-ray image processing is an emerging technique that has shown promise fo g the sensitivity of nodule detection. The method subtracts normal structures such as the r rom a current chest image using a previous corresponding image from the same patient, a eals potentially abnormal findings in overlapping areas.

r, artifact reduction is also necessary in TS processing because differences in patient posit ne of imaging can cause bone-related artifacts, possibly resulting in false-positive findings, g to the authors.

us studies, bone suppression has improved radiologists' detection of lung nodules on digit ays. In this reader study, the researchers examined differences in detection between onal TS (C-TS) and TS using bone suppression (BS-TS).

ologists were recruited to evaluate images processed using both the C-TS and BS-TS es. Images were selected from 31 patients with lung disease, including 19 with primary lun eight with lung metastases, and four with pneumonia. A majority of patients' lesions were as subtle, very subtle, or extremely subtle on prior CT scans.



ges used for temporal subtraction (TS). (a) Previous radiograph. (b) Current radiograph. (c) CT imag
ventional TS image. (e) Improved TS image acquired with bone suppression (BS) processing. The r
acts are reduced with BS-TS, and nodule areas are easily recognized. Image and caption courtesy
eylion *through* [CC BY 4.0](CC BY 4.0).

est radiographs were acquired using a flat-panel detector (AeroDR HQ, Konica Minolta) and processed using a TS imaging workstation w ed software that included bone-suppression processing functions.

erformance -- as assessed by figure-of-merit values -- of all radiologis ased significantly using the bone-suppression method, from 0.619 entional) to 0.696 (p = 0.032). The average sensitivity for detecting onary lesions improved from 67.9% to 75.4%, and the average numbe positives per case decreased from 0.336 to 0.252 using bone ession temporal subtraction.

overall observers' ability to detect new lesions increased significantly w se of BS-TS; this method allowed the enhancement of changes in the ty of faint lesions, providing higher image quality than C-TS," the auth d.

ately, the authors noted that lung anatomy is complex and that the ran eases possibly present on a chest radiograph is extensive. With furthe opment, the BS-TS technique could become a useful tool even for ienced radiologists, they wrote.

er observer performance studies including experienced radiologists w er number of cases are likely necessary to confirm the clinical usefulr computerized method," Takaki and colleagues concluded.

table chest x-ray images validated in TB patients

Vill Morton, AuntMinnie.com staff writer

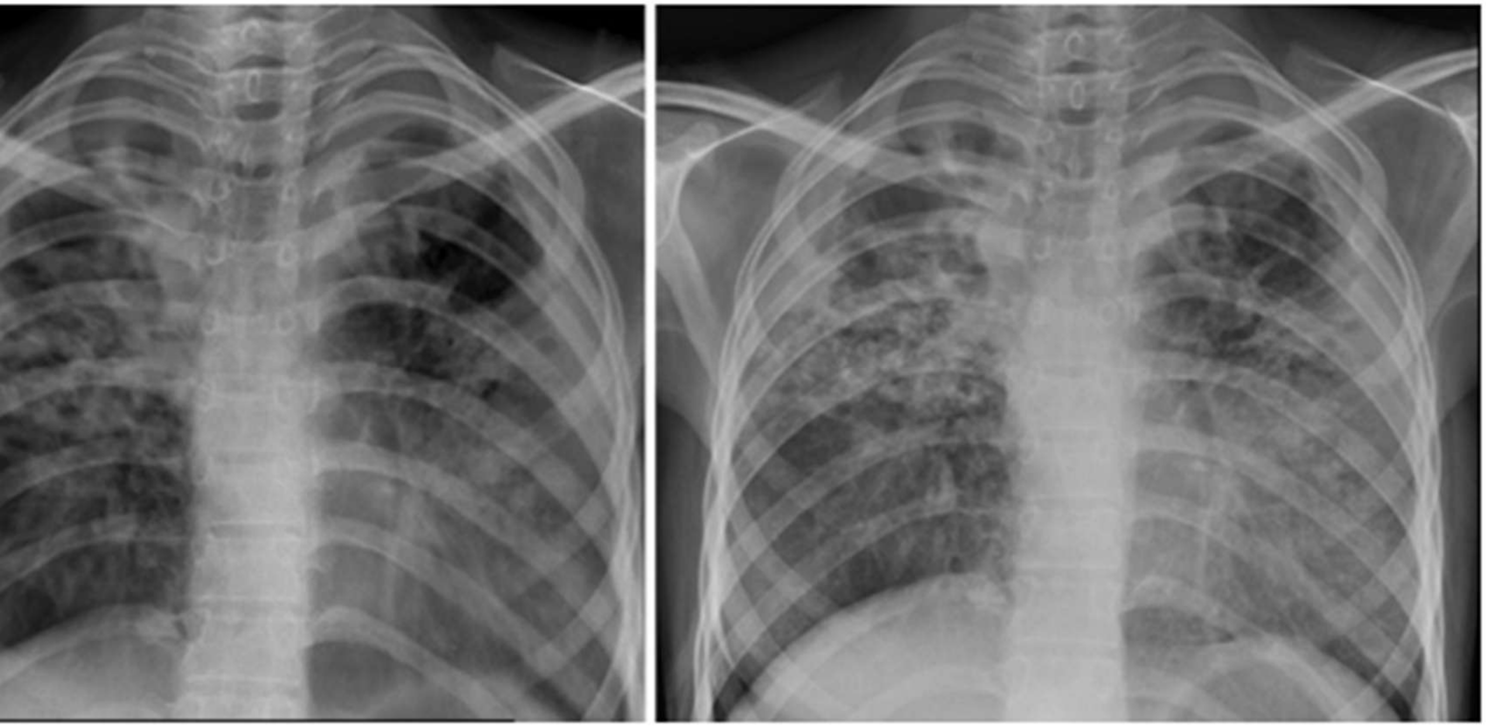
2, 2023 -- Portable chest x-ray images appear comparable to those red with standard digital systems in patients with tuberculosis (TB) -- a ould be good news for TB screening efforts, according to a group in In

t x-ray is an important screening tool for pulmonary TB, yet accessibili challenge in difficult-to-reach and underserved populations. This can tially be overcome by deploying portable digital x-ray machines, the rs suggest.

ever, these portable x-ray machines need to be validated before their yment in the field," wrote first author Dr. Raj Kamal of the National Jal ute for Leprosy in Agra, and colleagues. The study was published Apri *Indian Journal of Medical Research*.

at end, the group tested image quality as evaluated by two radiologists een a model called Mine 2 (LabIndia Healthcare), a portable handheld ystem weighing 1.8 kg, and digital x-ray units routinely used in their he es.

esearchers recruited 100 participants with suspected pulmonary TB fr tient clinics and a community health center in Agra. Each participant went two chest x-rays, once with each type of system. Both sets of ntified images were then independently read by two radiologists blind pe of machine used. The primary outcome was agreement between th y of images produced by the two systems.



Chest x-ray images for the s
individual with evidence of
tuberculosis using (A) the M
machine, and (B) a standard
digital x-ray machine. Image
courtesy of the Indian Journ
Medical Research *through* C
BY 4.0.

g to the findings, the intraobserver (radiologist) agreements regarding the status of 15 chest x-ray pa
the images ranged between 74% and 100%, with an unweighted mean of 87.2%, the group reported
in an overall comparison of image quality (on a scale of one to 10, with 10 denoting highest quality),
x-ray images had a score of 9 and the digital chest x-ray images had a score of 8, the researchers s
ent study shows that a handheld x-ray machine, which is easy to use and can potentially be carried
duces x-ray images with quality that is comparable to digital x-ray machines routinely used," the grou
omising, experiences of using handheld x-ray machines for dental purposes have shown that certain
heir use, such as operator movements, radiation protection of the operator, operator fatigue, and disi
d.
research is needed to evaluate the efficacy and effectiveness of handheld chest x-devices, as well as
implementation issues such as feasibility, adoption, and cost-effectiveness," they wrote.

TF calls for biennial mammography screening as of age 40

erigo Allegretto, AuntMinnie.com staff writer

0, 2023 -- The U.S. Preventive Services Task Force (USPSTF) has ed new draft recommendations for breast cancer screening that endo al screening with mammography beginning at age 40 for all women.

usly, the task force recommended that women in their 40s make an ual decision about when to start screening. This included taking into nt their health history, preferences, and how they value the different al benefits and harms.

SPSTF upped their new recommendation from a C grade to a B grade n in their 40s, saying that new and inclusive research prompted the on. The B grade means the task force recommends that clinicians pro e patients with the service, and that "at least fair" evidence has been s proving patient outcomes, with the benefits outweighing the harms. A C meanwhile means no recommendation for or against any service revi task force, with the balance between benefits and harms being "too c fy a recommendation. However, this also indicates that "at least fair" ce shows potential health improvement.

ew conducted by researchers from Kaiser Permanente supported the ed recommendation for breast cancer screening.

 we have consistently recognized the life-saving value of mammograp ence has become even more clear about when it is beneficial," the ta wrote.

SPSTF is also calling for studies focusing on the topics of supplemental ima
reast cancer screening for women of different ethnic and racial backgrounds
that new research in these areas can help the task force build on its
mendations.

the task force said there is not enough evidence to recommend for and aga
onal screening for women with dense breasts via breast ultrasound or MRI,
ntly" called for research in this area.

e women deserve to know whether and how additional screening might help
stay healthy," the USPSTF wrote.

sk force is also calling for more studies to better understand whether Black
n could potentially be helped by different screening strategies.

women are 40 percent more likely to die from breast cancer than white wo
o often get aggressive cancers at young ages," the task force wrote. "Ensu
women start screening at 40 is an important first step, yet it is not enough to
ve these inequities. It's important that healthcare professionals involve patie
versation on how best to support them to ensure equitable follow-up after
ning and timely and effective treatment of breast cancer."

raft recommendations are available for public comment from May 9 to June
People can submit comments on the draft recommendation by visiting the
c Comments and Nominations" section of the USPSTF website. The proces
es responding to specific questions and providing feedback in open text fiel