# INTERNET NEWS

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e use of empiric antibiotic therapy appears to prevent neither deterioration nor th among patients with <u>COVID-19</u> pneumonia, as shown in a Singapore study.

a group of patients with COVID-19 pneumonia, antibiotics were commonly rted in those who were severely ill. Patients who did vs did not receive ibiotics more often developed diarrhoea (34.7 percent vs 11.8 percent; p<0.01) I had slightly higher subsequent admissions to the intensive care unit (ICU; 8.0 cent vs 4.9 percent; p=0.384).

*tibiotics* 2022;doi:10.3390/antibiotics11020184]

thermore, antibiotic treatment did not result in lower 30-day (adjusted odds o [aOR], 19.528, 95 percent confidence interval [CI], 1.039–367.021) or inpital mortality (aOR 3.870, 95 percent CI, 0.433–34.625) rates in an analysis t controlled for age, comorbidities, and severity of COVID-19 illness.

e best performing inflammatory marker for predicting bacterial infections was C-reactive protein (CRP) level (area under the curve, 0.822) although the sitivity and specificity were <90 percent.

#### **COVID-19 intersects with other respiratory viruses**

VID-19 imposes challenges in antibiotic decision-making due to similarities between bacterial pneu noderate to severe COVID-19," according to the investigators.

ypical symptoms of COVID-19 pneumonia, such as fever, cough and dyspnoea, often prompt clinic rt empiric antibiotic treatment while waiting for diagnostic testing such as a SARS-CoV-2 polymera reaction test, radiology, and blood investigations.

nvestigators also noted that even if COVID-19 is confirmed, it is common that empiric antibiotics a nued pending further evaluation if the treating physician is not able to conclude that bacterial cotions have been adequately excluded.

understandable that healthcare providers would err on the side of antibiotic treatment, especially in talized and the critically ill. However, it is important to be reminded that antibiotics are not without ts," they pointed out.

ed, the patients treated with antibiotics in the current study were more likely to have diarrhoea. What is the concern that widespread unnecessary antibiotic use will subject patients to the risks of adverses and worsening of antimicrobial resistance globally. [*Lancet Glob Health* 2020;8:e1453-e1454]

.covid19treatmentguidelines.nih.gov/]

### ly details

ne total study population included 717 patients (median age 46 years, 42.8 percent male, 55.9 percent Chinese) hospitalized with COVID-19 at the National Centre for fectious Diseases and Tan Tock Seng Hospital, Singapore, from January to April 20. Of these, 86 (12.0 percent) were treated with antibiotics and 26 (3.6 percent) d documented bacterial infections.

The 278 patients with COVID-19 pneumonia, 86 (12.0 percent) were treated with tibiotics and only 54 (7.5 percent) had documented suspected or confirmed cterial infections. Among patients without pneumonia, only 11 (2.5 percent) ceived antibiotics.

tients treated with antibiotics were more likely to be older (60 vs 55 years; 0.008), have higher peak CRP levels (122.5 vs 37.5 mg/L; p=0.008), be admitted to e ICU at the time of COVID-19 pneumonia diagnosis (34.7 percent vs 3.0 percent; 0.001), and have received mechanical ventilation (17.3 percent vs 0.5 percent; 0.001). The majority of the patients were treated with an "access" group of tibiotics (eg, amoxicillin–clavulanate), as recommended by the World Health rganization guidelines.

e investigators called for additional studies on procalcitonin and CRP levels to aluate their utility in antibiotic decision-making in COVID-19 pneumonia.





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### asound finds link between long COVID, viral effect on vagus

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merigo Allegretto, AuntMinnie.com staff writer

bruary 15, 2022 -- Ultrasound found links between symptoms of long COVI disease and the effects of the SARS-CoV-2 virus on the vagus nerve, accord research that will be presented at the European Congress of Clinical crobiology & Infectious Diseases in April.

team led by Dr. Gemma Lladós from Germans Trias i Pujol Hospital in dalona, Spain found that COVID-19 patients with symptoms of vagus nerve sfunction mediated by SARS-CoV-2 also had nerve thickening, decreased ophageal and diaphragmatic mobility, and reduced maximum inspiratory essures values.

Ve need to improve our understanding of the mechanisms that may cause the rsistence of symptoms to help patients and find interventions that can preven d treat vagus nerve dysfunction," Lladós told *AuntMinnie.com*.

etching from the brain to the torso and into the heart, the vagus nerve plays a portant role in bodily functions. These include controlling heart rate, speech, gag reflex, transferring food from the mouth to the stomach, moving food rough the intestines, and sweating, among others.

st-COVID syndrome, also commonly known as long COVID, affects 10% to % of COVID-19 survivors, researchers wrote. Symptoms include persistent ice problems, difficulty in swallowing, dizziness, tachycardia, low blood essure, and diarrhea.



Spanish research has found possible links between long COVID and vagus nerve dysfunction in patients. Ultrasound images show (Above) longitudinal section of the left vagus at the cervical level, where there is a slight fusiform thickening, and (Below) an axial cut of left cervical vagus show in thickening. Images courtesy of Dr. Gemma Lladós et al.

ever, the researchers said the mechanism that causes long COVID is currently unle efore, Lladós et al wanted to determine the morphological and functional activities is nerve in their pilot study of long-COVID patients with dysfunction, using ultrasou ional tests.

looked at data from 22 patients who were selected from a cohort of 228 individua at least one symptom suggestive of vagus nerve dysfunction. Patients had a media years and presented between March and June 2021. Out of these, 20 were wome

Diarhea73%Tachycardia59%Dizziness45%Difficulty swallowing45%Persistent voice problems45%

Most common vagus nerve dysfunction symptoms in patients presenting with long COVID

study authors found that 19 patients had at least three dysfunction-related symptom nedian prior duration of symptoms was 14 months.

patients had mild vagus nerve thickening and higher echo on neck ultrasound scans acic ultrasound, meanwhile, showed flattened diaphragmatic curves in 10 patients. of 16 patients also showed reduced maximum inspiratory pressures.

liologists may find by ultrasound in the lateral cervical area some images over the vertex over the vertex of the sective inflammatory changes," Lladós said. "In addition, a flatte bragmatic curve visualized by chest ultrasound could translate into decreased bragmatic mobility during respiration."

team also found eating and digestive dysfunction in patients, with 13 out of 18 hav eation of trouble swallowing. Eight out of 19 patients also reported having their abiver food to the stomach impaired, two of whom had difficulty swallowing. Acid refailso seen in nine of 19 patients, four of whom reported difficulty delivering food to ach and three having hiatal hernia.

researchers also found abnormalities in voice function for eight out of 17 patients, ese reporting dysphonia, or persistent voice problems.

os told *AuntMinnie.com* that the team wants to compare their results with healthy rols and with patients infected by SARS-CoV-2 without the persistence of sympton the aim is to know if there is more morphological and functional involvement of th s nerve in infected patients.in infected

team's findings will be presented at the European Congress of Clinical Microbiolog ctious Diseases in Lisbon, Portugal, which will be held April 23-26.



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<b>G</b> CT Sponsored by Canon Medical Systems										

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n-counting CT improves image quality of coronary CTA Madden Yee, AuntMinnie.com staff writer uary 16, 2022 -- Using a photon-counting CT system for coronary CT ography (CCTA) improves image quality and diagnostic confidence an ers compared with conventional CT, according to a study published uary 15 in <u>*Radiology*</u>.

on-counting CT offers a number of benefits compared with traditional CCTA for coronary artery disease (CAD), wrote a team led by Dr. Salin amed, PhD, of the University Lyon in Villeurbanne, France.

tial resolution, soft-tissue contrast, and dose-efficient capabilities of photon of the potentially allow a better quality and diagnostic confidence of nary CT angiography in comparison to conventional CT," the team note

A is the go-to exam for assessing cardiovascular disease and has a high tive predictive value for CAD, Si-Mohamed and colleagues wrote. But al resolution and soft-tissue contrast limitations can affect diagnostic bility when it comes to small arteries and high-contrast (stents, fications) and low-contrast (noncalcified plaque) imaging. It also impaively high dose of radiation.



es from (A-E) coronary photon-counting CT and (F-J) energy-integrating detector dual-layer CT angiography in a 44-yearin. Volume-rendered photon-counting CT image (A) and volume-rendered energy-integrating detector dual-layer CT image t proximal coronary arteries (white arrowheads), but there is clear improvement in the depiction of distal coronary arteries wheads in A) with volume rendering and photon-counting CT in comparison to energy-integrating detector dual-layer CT. O es, pectinate muscle (B, G), aortic cusp commissure (C, H), noncoronary cusp (D, I), and papillary muscle (E, J) were better ted on photon-counting CT images (B-E) than on energy-integrating detector dual-layer CT images (G-J) (white arrowhead wheads indicate distal coronary arteries not depicted on energy-integrating detector dual-layer CT images and capt esy of the RSNA.

ton-counting CT addresses these concerns by using "energy-resolving" (i.e., ton-counting) detectors that separately track the energy of each photon, ording to the authors. The U.S. Food and Drug Administration (FDA) <u>cleared first device in September 2021</u> (Naeotom Alpha, <u>Siemens Healthineers</u>), and the technology.

photon-counting CT hasn't yet been tested for use for CCTA. Si-Mohamed colleagues performed what they said is the first human study to do so.

research included 14 individuals with coronary artery disease who erwent electrocardiographically gated, contrast-enhanced CCTA on both a ical prototype photon-counting CT device and a typical energy-integrating ector dual-layer CT system. Three cardiac radiologists read the exams and luated them for image quality, diagnostic confidence, and diagnostic quality ny features such as calcifications, stents, and noncalcified plaques using a -point scale (1 = insufficient, 5 = excellent).

group found that overall scores for image quality and diagnostic confidence e higher on the photon-counting CT images compared with images produced conventional CT system (5 vs. 4). Expressed in percentage of quality score rovement, the group reported the following:

Measure	Percentage improvement									
Overall image quality	57%									
Diagnostic confidence	55%									
Diagnostic quality										
Calcifications	100%									
Stents	92%									
Noncalcified plaque	45%									
Proximal lumen	48%									
Distal lumen	51%									
Coronary wall	69%									

#### Percentage quality score improvement with photon-counting CT compared with conventional CT for CCTA

study findings highlight the promise of photon-counting CT both for cardiac applications and for oth ing, according to a <u>commentary</u> accompanying the study by Dr. Veit Sandfort of Stanford Universite avid Bluemke, PhD, of the University of Wisconsin in Madison and editor of *Radiology*.

technology will take time to spread, but the inventiveness of the imaging community is profound," fort and Bluemke wrote. "In the past 30 years, we have experienced helical CT, wide-detector CT, a ral CT. Each time, it seemed CT may have peaked. Once again, CT has reinvented itself with photo ting detectors."





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actions to CT contrast may also increase MRI contrast risk Kate Madden Yee, AuntMinnie.com staff writer oruary 22, 2022 -- Patients who have allergic reactions to iodinated contrast agents ed in CT exams may also be at higher risk for allergic reactions from gadoliniumsed contrast agents (GBCA) used with MRI, according to a study published Februa in <u>*Radiology*</u>.

e findings highlight the need to carefully assess the contrast reaction history in ients undergoing MRI scans, said senior author Dr. Hye-Ryun Kang, PhD, of Seou tional University College of Medicine in South Korea, in a statement released by the NA.

raditionally, a history of iodinated contrast media hypersensitivity was not nsidered as a risk factor for hypersensitivity to GBCAs and vice versa, owing to the actural and compositional differences between the two," she said. "The results of or dy challenge this idea."

BCAs are commonly used with MRI exams, and although they are generally nsidered safe, their increased use has translated into higher rates of allergic reaction ote a team led by lead author Dr. Yoon Hae Ahn, also of Seoul National University.

e group sought to investigate any connection between allergic reactions from linated contrast agents and GBCAs. The team analyzed 331,070 cases of GBCA posure in 154,539 patients over an eight-year period. Of these total cases, there wer 04 allergic reactions (0.4%); of these allergic reactions, 0.4% were acute.

#### s team found the following:

Patients who had a history of allergic reactions to iodinated contrast were 4.6 times more likely to ve a reaction to GBCAs.

ecurrence rate of allergic reactions to GBCAs was highest in patients who didn't receive medication or switched to a different GBCA.

hose patients who both received premedication before undergoing MRI and switched to a ferent GBCA had the lowest rate of allergic reaction recurrence, at 5%.

ients who just received premedication had an allergic reaction recurrence rate of 19%, while se who just switched to a different GBCA had a rate of 6%.

increased risk of reaction to GBCAs used with MRI after reaction to iodinated contrast with CT be due to a predisposition to drug allergies rather than cross-reactivity, the investigators noted.

rdless of cause, how can the problem of contrast reactions be addressed? Patients should be sed for any prior allergic responses to contrast, the authors urged.

l patients undergoing MRI with GBCA exposure, a detailed history of previous hypersensitivity ons should be conducted, and when necessary, appropriate prevention measures such as using edication and switching to a different type of GBCA should be implemented," they wrote.

tudy suggests more research is needed, according to an accompanying editorial written by avid Kallmes and Jennifer McDonald, PhD, both of the Mayo Clinic in Rochester, MN.

and Kang et al have provided intriguing new data about potential risk factors and preventative ures for acute and delayed reactions to gadolinium-based contrast agents," they wrote. "Such ngs merit further investigation to improve contrast material safety and patient care."

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d for Detection of Breast Arterial Calcifications via Mammograms Indicates Likelihood of Heart Disease

ternational staff writers 2022



new method for the detection and quantification of breast arteria cifications (BACs) has important implications for heart disease risk.

lpara Health (Wellington, New Zealand) has secured a US paten bused on detection of (BACs) via mammograms. BACs are media cifications of the mammary arteries (inappropriate and pathologica positions of mineral in the form of calcium phosphate salts). Generally insidered as a benign and incidental finding from an oncological respective, BACs have been demonstrated to be associated with chronic ney disease, bone mineral density reduction, diabetes mellitus tabolic syndrome, hypertension, coronary artery disease, and strokes. t clinical research correlating BACs with the risk of coronary artery disea d on the absence versus presence of BACs, or semi-quantitative BAC metric e uncertainty and standard deviation. Consequently, there have been incon ngs. That was exactly the same situation as with breast density measurement archers made the field much more quantitative and objective by using mated algorithms. While a commercial software product that can detect tify BACs during routine mammographic screening, using this data then proent's risk of heart disease will require further development.

latest patent - which builds off Volpara Health's approach to quantitative ctive breast density scoring -is a significant advance. Using breast position and anthropomorphic measures, a tissue composition map that ide Cs can be created from a mammogram. Subsequently, a score is generate cates the likelihood of heart disease resulting from these calcifications.

s patent is an important advancement in patient care. Being able to quantify ial calcifications has the potential to take what are often considered incignificant findings on a mammogram, and triage patients to cardiac car ventions," said Volpara CEO Ralph Highnam.



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namic chest radiography reveals diaphragm dysfunction Vill Morton, AuntMinnie.com staff writer uary 28, 2022 -- Dynamic chest radiography is a promising new tool for nosing patients with breathing symptoms related to diaphragm dysfunction, rding to a study published February 21 in *European Respiratory Journal (El n Research*).

pilot study, U.K. investigators explored the use of dynamic chest radiograph ries of patients with symptoms suggesting diaphragm dysfunction. The techn ided promising real-time metrics on diaphragm and chest wall motion and rants further study to see if it can complement established tools, such as sound and traditional fluoroscopy, the authors suggested.

vnamic chest radiography], which combines the visual ease of fluoroscopy wability to provide quantifiable measures of hemidiaphragm and chest wall ement, may be of use as an adjunct technique," wrote corresponding author FitzMaurice of the University of Liverpool's Heart and Chest Hospit

amic chest radiography is a novel real-time digital fluoroscopic imaging syst produces clear, wide field-of-view diagnostic images of the thorax and hragm in motion, alongside novel metrics on moving structures within the acic cavity.

tious studies have shown the technique can be used to assess average movem the diaphragm during tidal and deep breathing in healthy volunteers, as well a formal diaphragm dynamics in people with severe chronic obstructive pulmor rder. is study, FitzMaurice and colleagues tested the technique for visualizing hragm motion in a series of patients with suspected damage of the phrenic net controls the diaphragm and, ultimately, normal breathing.

group enrolled 21 consecutive patients referred for diaphragm function testined on suspicious plain chest x-rays, clinical symptoms (breathlessness, orthop ced exercise tolerance), and/or suggestive history (cardiac intervention, traus tion).

ging was performed using a dynamic radiography system from Konica Mino thcare for cineradiographic imaging and installed in a standard radiography

ents were instructed to take three sharp sniffs followed by a breath to full ration then full expiration. Images were acquired in the posteroanterior planeling position, with a maximum allowable image exposure time of 300 frame econds.

researchers observed paradoxical motion (in which the diaphragm moves in osite direction than it should during inhaling and exhaling) in 14 patients, and irmed it in six who also underwent fluoroscopy or ultrasound. In four patient mic chest radiography showed reduced hemidiaphragm excursion, but no doxical motion. In three patients, the researchers observed normal diaphragn on.



wo still images from a dynamic chest radiography sequence showing baradoxical movement of the paralyzed right hemidiaphragm from (a) rest to b) end sniff maneuver. Image courtesy of ERJ Open Research. ddition, the time taken for preparation, patient instruction, and image acquisit approximately five minutes per patient, which is comparable to standard cher ys, the authors noted.

re, [dynamic chest radiography] proved quick and straightforward to perform wrote. "It produces easily interpretable metrics on diaphragm and chest wal ion that warrant further study alongside established diagnostic tools."

sible advantages of digital chest radiography over ultrasound or fluoroscopy ude shorter acquisition times, with visual results available to the ordering ician immediately after acquisition, and at a lower radiation dose than roscopy, FitzMaurice et al suggested.

ddition, dynamic MRI has been used as a tool to analyze diaphragm function it is typically not used in clinics due to its high cost, limited availability, and trate MRI suite. On the other hand, the small footprint of digital chest ography could allow installations in standard radiography rooms, the authors ed.

our knowledge, this is the first time [dynamic chest radiography] has been une investigation of hemidiaphragm dysfunction, and there remains large ential for further work," the group concluded. THE END