MEDIC
www.medic.com.vn

INTERNET NEWS

BS DƯƠNG ĐĂNG NGỌC PHƯƠNG
PK PHỤ KHOA

Transnasal Endoscopy Tested in Primary Care for Esophageal Screening

Ted Bosworth

October 17, 2022

In primary care, transnasal endoscopy without sedation might be the solution for an easier and simpler route to early diagnosis of Barrett's esophagus and esophageal cancer.

The growing prevalence of Barrett's esophagus and esophageal cancer have created an urgent need for screening tools that are accurate but simpler than conventional endoscopy, according to Lotte J. Huibertse, MSc, of the Department of Gastroenterology and Hepatology at Raboud Institute for Health Sciences, Nijmegen, the Netherlands.

"Transnasal endoscopy [TNE] is a safe and well-tolerated alternative to conventional endoscopy, and it has the potential to be used in an office-based setting," Huibertse said.

This contention is supported by a prospective study. Over a 1-year period, 166 patients from four different primary practices agreed to participate in the trial. All had been diagnosed with symptoms of gastroesophageal reflux disease.

Those considered to have Barrett's on the basis of TNE administered without sedation underwent a conventional endoscopy with biopsies to confirm the diagnosis, according to Huibertse, who presented the findings at the 2022 United European Gastroenterology Week.

Barrett's esophagus was suspected in 14 (8.4%) of those evaluated with TNE. All but two had the diagnosis confirmed when evaluated with conventional endoscopy. The absence of metaplasia on the biopsies does not exclude the possibility that Barrett's was present, the researchers added.

Of the others evaluated, no abnormalities were seen in 77 (46.4%). Thirty-seven patients (22.4%) had hiatal hernias. The others had varying degrees of esophagitis.

For Now, a "Triage Test"

For patients suspected of having Barrett's esophagus, this transnasal procedure could streamline a screening process that now involves referral to a specialist, use of sedation, and a recovery period, Huibertse said. But she cautioned that TNE cannot yet be considered a substitute for conventional endoscopy.

"As further evidence is needed on the yield of unsedated, transnasal-guided biopsies to detect neoplasia, this approach should only be used as a triage test after which confirmatory conventional endoscopy is indicated when Barrett's is suspected," she told *Medscape Medical News*.

TNE is already being used to circumvent the limitations of conventional endoscopy at many centers. One group in London opened a TNE clinic outside of a conventional endoscopy suite to facilitate endoscopic studies during the COVID-19 pandemic.

Based on that experience, Jason Dunn, MBBS, PhD, a consultant gastroenterologist at Guy's and St. Thomas' NHS Foundation Trust, called TNE "a safe, well-tolerated and resource-efficient alternative to conventional endoscopy." Consistent with other published reports, Dunn and his colleagues observed no discomfort or minimal discomfort in more than 90% of the 190 patients who underwent the procedure.

The Dutch group reported a similarly high rate of patient acceptance in the primary care setting. According to Huibertse, no serious adverse events occurred in her study, and most patients reported little or no discomfort. When asked to rate tolerability of on a 1-10 visual analogue scale, the mean score was 6.3

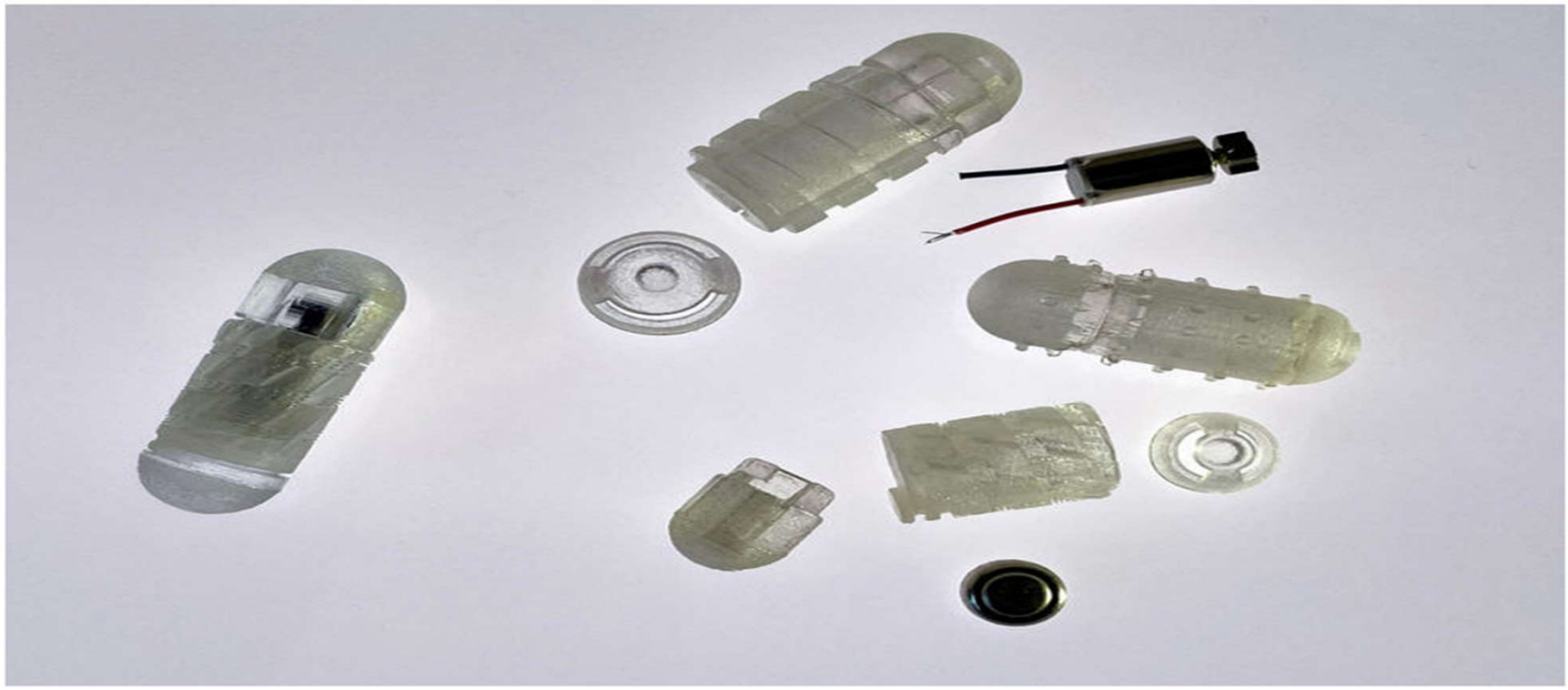
By bypassing the tongue, palate, and uvula, the ultrathin endoscope — roughly 6 mm in diameter — generally circumvents the gag reflex, according to published studies, including data presented by Dunn. He said the upfront costs of acquiring transnasal endoscopes are compensated by foregoing sedation. This reduces the need for monitoring and staff. Relative to conventional endoscopy, unsedated TNE also reduces disposable plastics, such as mouthguards and syringes required to administer sedatives.

The premise of unsedated TNE is consistent with several initiatives to make screening for Barrett's esophagus simpler and more efficient, according to Vivek Kaul, MD, a professor of medicine in the Division of Gastroenterology and Hepatology, University of Rochester Medical Center, Rochester, New York. Kaul called offering these screening techniques in primary care settings "an attractive new paradigm" to handle the growing demand for screening.

"This is especially worth exploring given the post-pandemic backlogs and access issues that GI endoscopy has been dealing with," Kaul said. Relative to conventional endoscopy, he agreed TNE offers several advantages, including lower cost and avoiding the potential complications of sedation.

Robotic Capsule Drills Intestinal Mucus to Deliver Protein Drugs

OCTOBER 5TH, 2022 CONN HASTINGS GI, MATERIALS, MEDICINE



Engineers at MIT have collaborated to develop a robotic drug delivery capsule that is specially designed to administer delicate protein drugs, such as insulin, through the wall of the intestine. Proteins are not suited for oral delivery, as they are typically destroyed by the low pH in the intestine and they can't pass through the mucus layer that lines the gastrointestinal tract.

Protecting protein drugs from the acidic environment and providing a way to traverse this mucus layer is the goal behind this latest technology. The capsule can be loaded with the protein and then once swallowed it becomes activated by the low pH in the intestine. The capsule has a studded cap at one end that begins to spin, tunneling through the mucus until it reaches the epithelium and deposits its drug payload.

Patients with diabetes often require regular insulin injections. This is inconvenient and painful. An oral version of insulin would be very useful for such patients, but to date no-one has developed an effective means to achieve this. The acidic environment in the gut is particularly hostile for protein drugs, and the thick layer of mucus that is present in our intestines is a largely impenetrable barrier for intact proteins.

Enter the "RoboCap," a robotic pill that can manually drill down through mucus in the gut to access the underlying epithelium, offering a means to deliver proteins orally. The capsule is approximately the size of a multivitamin, and it includes a reservoir at one end that contains the protein drug and a drilling mechanism at the other end. The spinning cap is powered by a small motor and it is studded to help brush away the mucus.

The entire capsule is covered in a gelatin coating that is broken down at a specific pH when it reaches the small intestine. This initiates the spinning cap to begin work, and once the capsule drills through the mucus layer and reaches the epithelium it releases the protein payload.

However, it is possible to fine-tune this gelatin coating so that it will break down at different pH levels, suggesting the system could be tailored to deliver drugs to other parts of the gastrotinestinal tract that have different levels of acidity, such as the stomach.

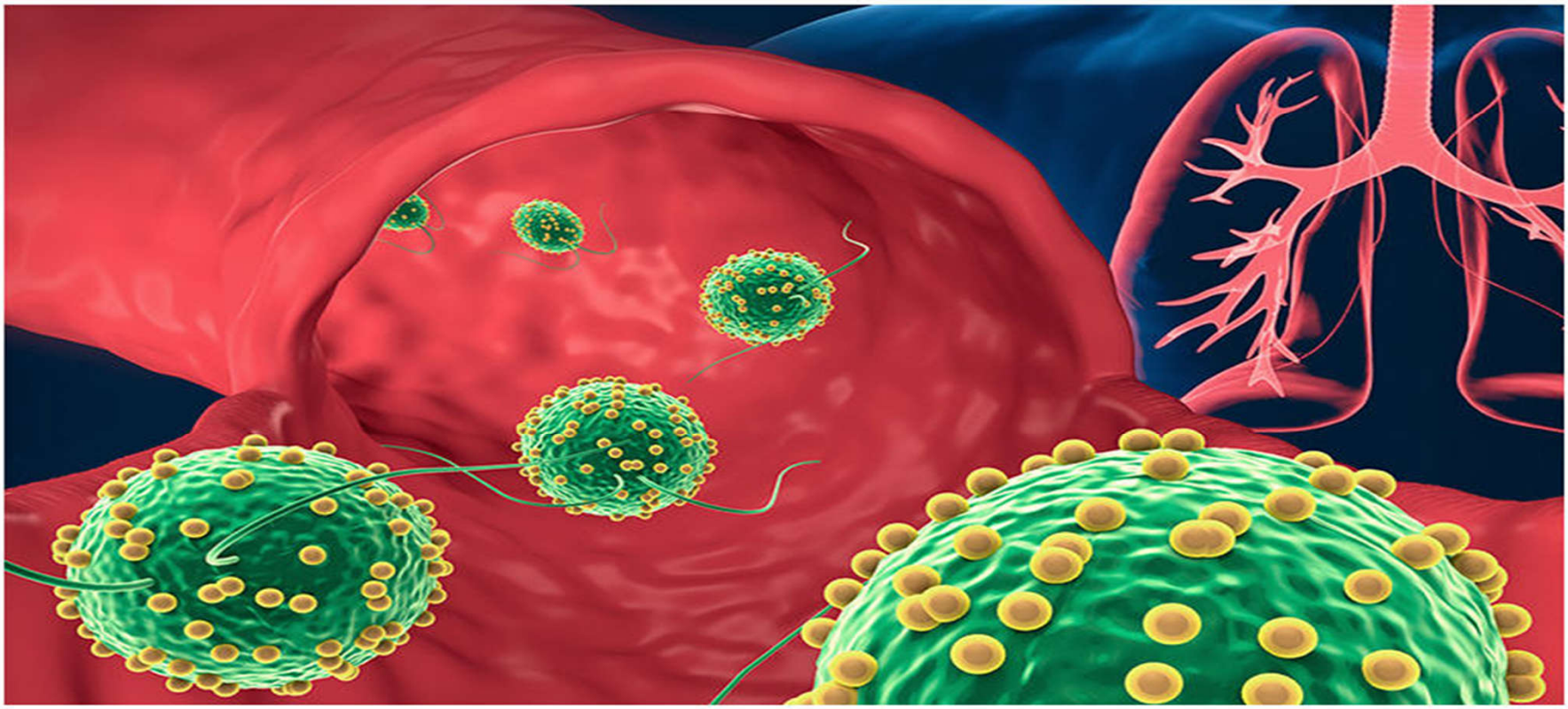
"What the RoboCap does is transiently displace the initial mucus barrier and then enhance absorption by maximizing the dispersion of the drug locally," said Giovanni Traverso, one of the creators of the new robotic pill. "By combining all of these elements, we're really maximizing our capacity to provide the optimal situation for the drug to be absorbed."

Study in journal *Science Robotics*: RoboCap: Robotic mucus-clearing capsule for enhanced drug delivery in the gastrointestinal tract

Via: MIT

Algae-Based Microrobots Deliver Antibiotics within Lungs

SEPTEMBER 28TH, 2022 CONN HASTINGS CRITICAL CARE, MATERIALS, MEDICINE, NANOMEDICINE

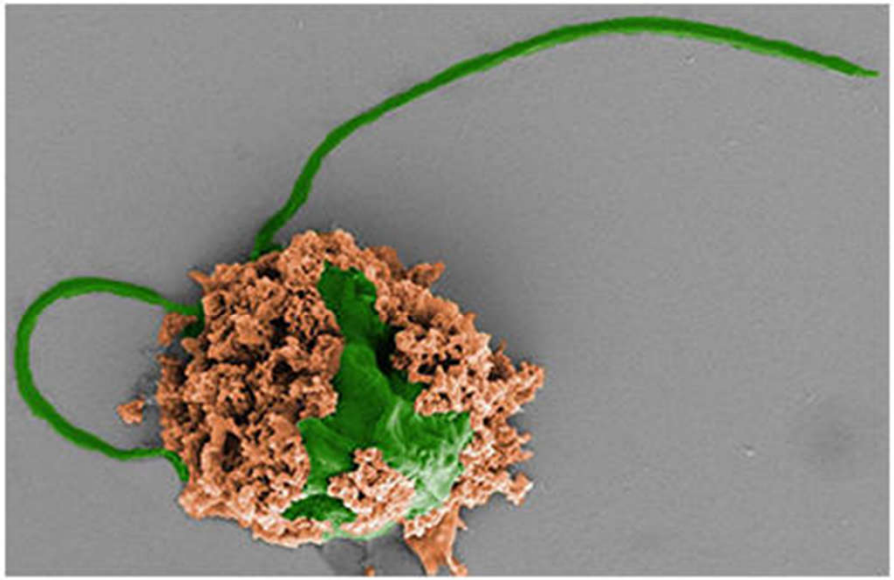


Researchers at the University of California San Diego have developed a microrobot system to treat bacterial pneumonia. The microrobots consist of living algal cells that can swim very effectively in biological fluids, allowing them to navigate throughout the lungs and deliver drugs to difficult-to-reach areas. The algal cells are studded with antibiotic-loaded polymer spheres that are coated with cell membranes from neutrophils, which help them to neutralize inflammatory molecules that are released by bacteria in the lungs, providing a localized anti-inflammatory effect. In tests in mice with bacterial pneumonia, the microrobots helped to clear the infection. All the treated mice survived for at least 30 days, whereas untreated mice died within three days.

Bacterial pneumonia can have dire consequences for patients, particularly since it can often develop when someone is mechanically ventilated and already in a serious condition. It can also be difficult to treat. Simply administering large doses of antibiotics into the blood stream may not work so well, as very little of the dose ends up where it is needed in the lungs.

There is a need for more targeted and effective therapies. This prompted these UCSD researchers to create a localized therapy that can actively swim into the lungs and deliver drugs exactly where they are needed. "Our goal is to do targeted drug delivery into more challenging parts of the body, like the lungs," said Liangfang Zhang, one of the creators of the new microrobots. "And we want to do it in a way that is safe, easy, biocompatible and long lasting. That is what we've demonstrated in this work."

The researchers chose algae as a delivery vehicle for antibiotics. The algal cells are highly adept at swimming through biological fluids, such as the thick mucus that is typically present in the lungs of someone with pneumonia. They attached antibiotic-loaded polymer spheres to the outside of the algal cells, and also coated the spheres in neutrophil membranes for added anti-inflammatory action.



Colored SEM image of a pneumonia-fighting microrobot made of an algae cell (green) covered with biodegradable polymer nanoparticles (brown). The nanoparticles contain antibiotics and are coated with neutrophil cell membranes. Images credit: Credit: Wang lab/UC San Diego, Fangyu Zhang and Zhengxing Li

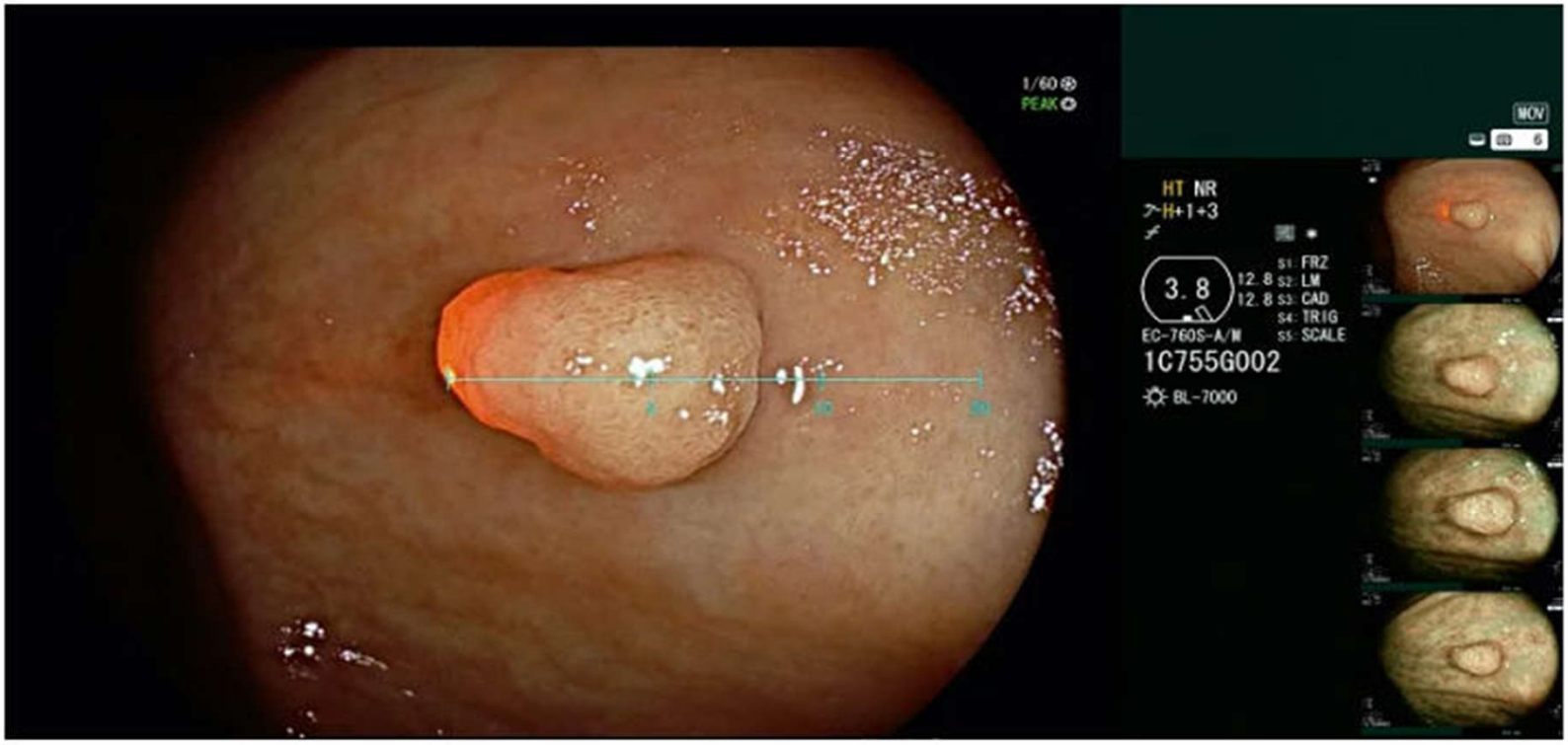
They tested the microrobots in mice with pneumonia caused by *Pseudomonas aeruginosa*. This type of pneumonia tends to occur in patients who have undergone mechanical ventilation, and it can be life-threatening. The team delivered the microrobots into the lungs using a tube inserted into the trachea. In the treated mice, the infection cleared up after a week, and all survived, whereas the untreated mice died in as little as three days. The approach was also more effective than IV antibiotics, requiring a fraction of the dose to effectively treat the infection.

"With an IV injection, sometimes only a very small fraction of antibiotics will get into the lungs. That's why many current antibiotic treatments for pneumonia don't work as well as needed, leading to very high mortality rates in the sickest patients," said Victor Nizet, another researcher involved in the study. "Based on these mouse data, we see that the microrobots could potentially improve antibiotic penetration to kill bacterial pathogens and save more patients' lives."

NEWS | October 7, 2022

Fujifilm introduces EW10-VM01 for virtual scale function

The new software can be deployed in the expansion unit EX-1 and used with CAD EYE.



SCALE EYE has been designed to help endoscopists estimate colon lesion size. Credit: FUJIFILM Europe GmbH.

Fujifilm Europe has introduced the new EW10-VM01 software for SCALE EYE real-time virtual scale function, which is designed to help endoscopists estimate the size of lesions in the colon.

Designed for the real-time detection and characterisation of lesions, SCALE EYE is the company's latest technology to be introduced as part of the ELUXEO Ultra platform.

The EW10-VM01 software can be deployed in the expansion unit EX-1 and used with CAD EYE, a colon polyp detection and characterisation function.

SCALE EYE has been designed to help endoscopists estimate the size of lesions in the colon by simply pressing the endoscope switch.

The recently developed endoscope EC-760S-A/M, L is included in the software. EC-760S-A/M, L is equipped with a class one laser, the point of which is visible in the endoscopic image.

The laser point position changes according to the distance between the tip of the endoscope and the object.

The laser point position changes according to the distance between the tip of the endoscope and the object.

The scale interval size automatically adjusts depending on the laser point position.

Fujifilm Europe senior product manager Saskia Papa said: "SCALE EYE is yet another technological leap forward in the fight against colorectal cancer by targeting challenges faced by colonoscopists.

"It is widely known that whilst detection and accurate characterisation of lesions has an impact on the occurrence of interval cancers, accurate measurement of lesions is vital in not only assigning appropriate surveillance intervals but also to determine the most appropriate course of therapy.

"With SCALE EYE, we have a real chance to further support physicians in improving the quality of colonoscopy, from screening through to treatment, and to ultimately improve the lives of patients."

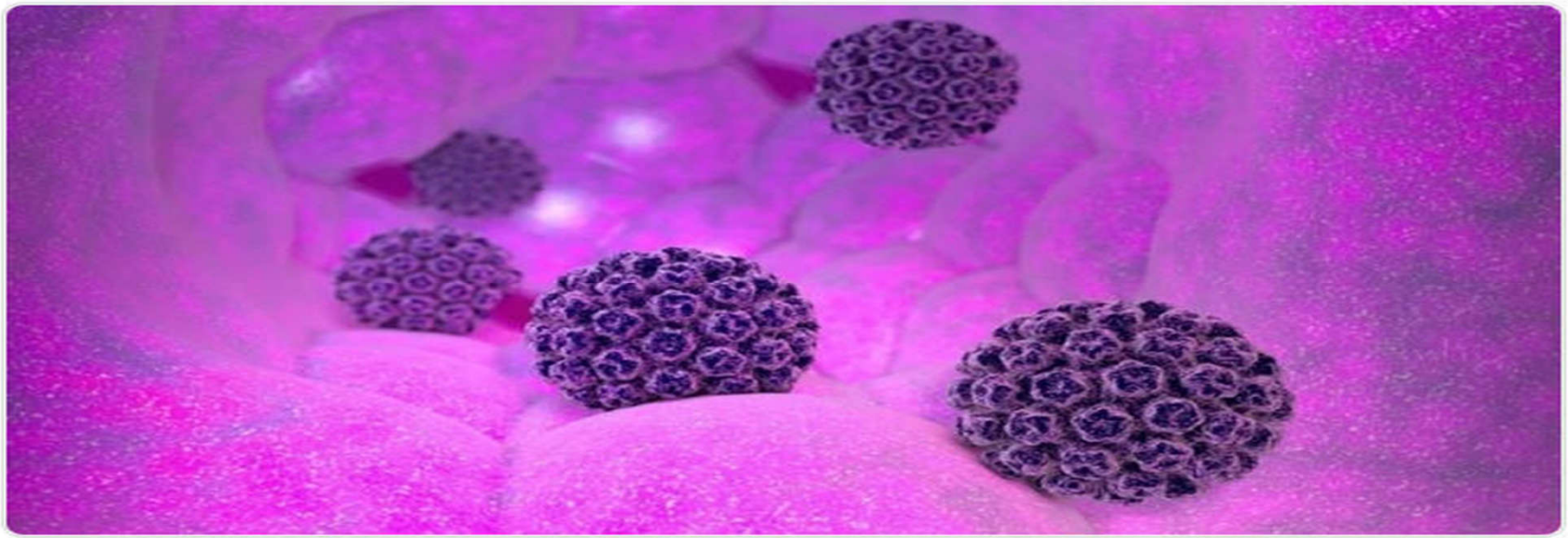
In 2020, Colorectal cancer was the second most frequently occurring cancer in Europe and accounted for 12.7% of all new cancer diagnoses.

Fujifilm noted that the early detection and diagnosis of the disease, as well as pre-cancerous lesions, would significantly reduce treatment complexity and improve patient outcomes.

Lesion size is considered to be one of the most important factors in making treatment decisions.

The role of cellular or cytokine response and vaginal microbiome dysbiosis in the clearance, persistence, and recurrence of HPV infection

Human Papillomavirus (HPV) causes cervical cancer and genital warts, a common sexually transmitted infection. Even after the implementation of prophylactic HPV vaccination in young women, cervical cancer remains the fourth most common type of cancer globally.



Study: Role of Immunity and Vaginal Microbiome in Clearance and Persistence of Human Papillomavirus Infection. Image Credit: Naeblys/Shutterstock

Background

In most cases, HPV infection clears spontaneously within 6-18 months. This might be due to the genital microbiome, host defense mechanisms, and other factors associated with the female genital tract. Recently, researchers have reviewed the role of cytokine or cellular response and vaginal microbiome dysbiosis in the persistence, clearance, and recurrence of HPV infection. This study is available in *Frontiers in Cellular and Infection Microbiology*.

Immune responses and HPV infection

Scientists have reported that innate and adaptive immunity protects hosts at the mucosal surface from HPV virus invasion. After HPV infection, the immune system gets activated, where mature antigen-presenting cells (APCs) secrete cytokine, which in turn, induces activation and deployment of other immune cells in the infection site.

Previous studies have highlighted the relationship between genital mucosal cytokine levels and management, i.e., control and clearance, of HPV infection in the cervix. Scientists have reported that within a few days of HPV infection, cytokine concentration in the cervix increases, subsequently reducing the following clearance of HPV from the cervix. Mechanistically, when mature APC interacts with naïve CD4+ and CD8+ T cells, it differentiates into varied T helper effector lineages and cytotoxic T lymphocytes (CTLs), respectively. These cells clear the virus from the host.

Related Stories

- Age-related changes in microbiome composition affects brain macrophages
- Nutritional approaches targeting gut microbiome could improve brain disorders
- The compositional and functional diversity of the gut fungal microbiome

Prior studies have shown that the host's immune system cannot always prevent disease progression. This is because HPV deploys various mechanisms to evade host immune responses, including modification of APC function and inhibition of keratinocyte CCL20 expression that might compromise the cytotoxic immune response.

Researchers reported that HPV evades natural killer cells, an important component of the innate immune response. They also detected high levels of the anti-inflammatory cytokine, i.e., IL-10, in women with persistent HPV infection, compared to those who cleared the HPV infection. Studies have also shown that HPV infection can alter the differentiation of monocytes into mature dendritic cells and affects the function of CD4+/CD8+ and regulatory T cells.

Vaginal microbiome and HPV infection

The authors found substantial evidence suggesting that women with a relatively low abundance of vaginal *Lactobacillus* species and high concentration of microbes belonging to genera *Sneathia, Atopobium, and Gardnerella,* were at a higher risk of not clearing HPV infection.

Interestingly, several microscopic and molecular-based studies have indicated that women with a relatively higher concentration of *Lactobacillus* in their vaginal microbiome are less likely to contract HPB infection. In contrast, women with a higher level of bacterial vaginosis (BV)-linked bacteria, such as *Dialister, Atopobium, Streptococcus, Prevotella, Megasphaera, Mycoplasma, and Gardnerella,* are highly likely to acquire HPV infection.

Scientists have reported that *Lactobacillus gasseri*-enriched microbiome has significantly enhanced the HPV clearance rate. However, women with CIN showed a high abundance of *L. iners* in their vaginal microbiome. Studies have also shown that certain vaginal microbiota can modulate hosts' immune responses, i.e., altering important anti-tumor and anti-viral immunity components in the female genital tract.

FDA-Approved At-Home Spirometer: Interview with Charvi Shetty, Co-Founder and CEO at Aluna

OCTOBER 17TH, 2022 CONN HASTINGS

CARDIAC SURGERY, CARDIOLOGY, DIAGNOSTICS, EXCLUSIVE, MEDICINE, PEDIATRICS, REHAB, THORACIC SURGERY

The COVID-19 pandemic has put lung health firmly in our minds. For those with chronic lung diseases, such as asthma and COPD, an important way to keep track of lung health is to use a spirometer to measure how well air can move in and out of the lungs during forced breathing. However, patients would typically attend with a lung specialist to perform this test. This is inconvenient and precludes regular monitoring to keep a close eye on lung health and spot any upcoming disease exacerbation.

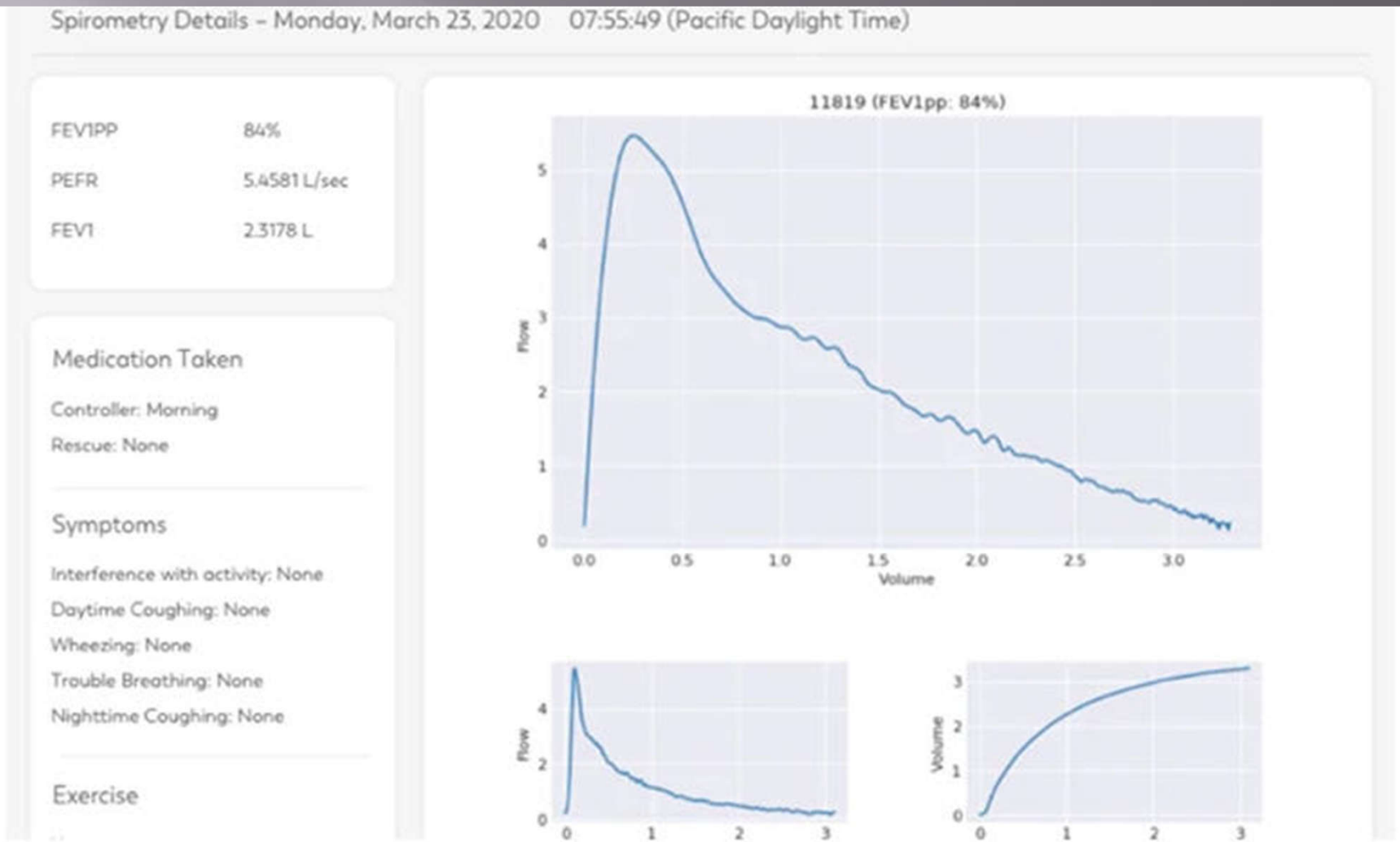
This is the motivation behind this latest technology, an at-home digital spirometer, created by a medical startup called Aluna. The device is easy to use, requiring the patient to blow into it daily, and the company envisages the technology as similar to the blood-glucose tests used by patients with diabetes to keep track of their condition.

To increase patient compliance, and to make the process more fun, the system also includes computer games that incentivize the patient to use the device regularly and share their lung health data with their clinician.

Medgadget: What inspired you to design an at-home spirometer? Who is it intended for?

Charvi Shetty: It started off as a capstone project at UC Berkeley where a UCSF doctor shared the unmet need around monitoring and predicting the onset of respiratory attacks for people suffering from chronic lung conditions like asthma and COPD. I grew up seeing my mom miss work and brother getting pneumonia triggered by asthma as a child, and while prototyping Aluna, I discovered that I had asthma quite by accident. I was supposed to be the healthy control group but my spirometer readings revealed disease. My co-founder, Indy, grew up with asthma as a child, so this is a problem that's very close to our founding team.

This process revealed a deep unmet need for monitoring chronic respiratory conditions at home. There was no accurate and reliable way to measure objective measurements outside of the hospital, so we built it. Best of all, it can be used for all chronic lung conditions, so our reach goes way beyond asthma.



Aluna collects patients' medication usage, symptoms and allows doctors to better manage their patients' care outside the office. Doctors can now see if medications are working and start to learn a patient's triggers to better manage their lung health. There is a provider dashboard which allows the device and the app to work together to collect a broad set of data (medications, symptoms, environmental factors) for broad home health monitoring.