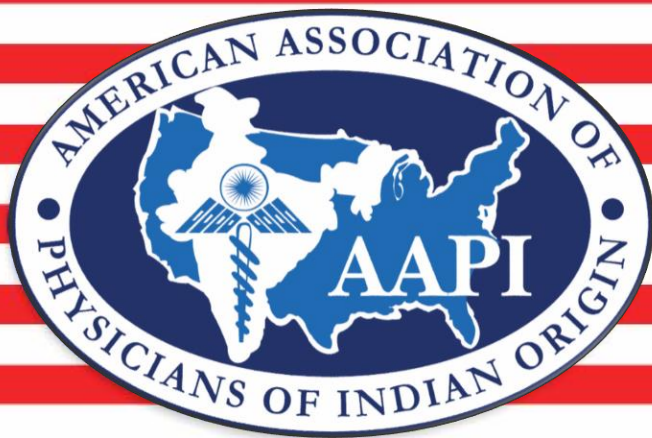


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“Wherever the art
of medicine is loved,
there is also a
love of humanity.”
- Hippocrates

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This Spring Issue of JAAPI is Dedicated to
Har Gobind Khorana, Ph.D.
Nobel Prize in Physiology or Medicine 1968



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In 1968, Dr. Har Gobind Khorana was jointly awarded Nobel Prize in Physiology or Medicine with Marshall W. Nirenberg, and Robert W. Holley for their pioneering work in deciphering the genetic code. Dr. Khorana was the first in the world to synthesize a functional gene outside a living cell. He was considered as the founding father of the field of chemical biology, which paved the way for genetic engineering and gene therapy.

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Pioneers in Medicine and Healthcare

Har Gobind Khorana, Ph.D.

Winner: 1968 Nobel Prize in Physiology or Medicine

Father of the Field of Chemical Biology

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In 1968, Dr. Har Gobind Khorana shared the Nobel Prize in Physiology or Medicine with Marshall W. Nirenberg and Robert W. Holley for their pioneering work in “deciphering the genetic code”, as per the layperson language. The Nobel Prize Committee stated that the prize was awarded for their *interpretation of the genetic code and its function in protein synthesis*. This is the code that became the subject of the best-selling book *The Language of God* authored by Francis S. Collins, M.D., the former Director of the US National Institutes of Health in Bethesda, Maryland. Dr. Har Gobind Khorana was the first and until now the only person of Indian heritage to receive Nobel Prize in Physiology or Medicine.

Dr. Khorana was born on January 9, 1922, in Raipur in Punjab, India (currently in Pakistan) in a poor family. His father was a *Patwari* (a village agricultural taxation clerk) in the British India. Dr. Khorana was the youngest in a family of one daughter and four sons. But his father gave utmost importance to education, and he ensured that all his children were educated well. In fact, the Khoranas were the only literate family in their village of about 100 people.

Dr. Khorana attended D.A.V. High School in Multan in West Punjab. Later, he obtained B.Sc. (1943), and M.Sc. (1945) degrees from Punjab University in Lahore with the assistance of scholarships. In 1945 he went to England on a Government of India Fellowship to study organic chemistry at the University of Liverpool. He received Ph.D. in 1948. The following year he went to pursue postdoctoral work at the ETH Zurich in Switzerland. It was here he met Esther Elizabeth Sibler, who later became his wife. Esther brought a consistent sense of purpose into his life, when he had to move from one country to another finding his destiny in life. After one year of work in Switzerland, he returned to India and could not find a suitable job to continue his research work. So, he returned to England in 1950. In 1952 he got married and moved to Vancouver, British Columbia in Canada with his wife. In Vancouver, Dr. Khorana was excited to start his own lab after accepting a position with the British Columbia Research Council. Although the Council had few facilities, it gave its researchers all the freedom they need to succeed in their endeavors. In 1960 Dr. Khorana moved to University of Wisconsin-Madison's Institute for Enzyme Research, accepting the position of its Co-Director. The University of Wisconsin-Madison (UWM) has the reputation of producing 20 Nobel Laureates. In 1964, Dr. Khorana was named Conrad A. Elvehjem Professor of Life Sciences at the UWM. It was here Dr. Khoran deciphered the mechanism by which RNA codes for the synthesis of proteins. He became the first scientist to chemically synthesize oligonucleotides in the lab. These two pieces of pioneering work fetched him the Nobel Prize in 1968. He did not rest with that. Later in 1970s Dr. Khorana prepared the world's first synthetic gene. By preparing a functional gene in a test tube, Dr. Khorana became the Father of the Field of Synthetic Biology. Today, we are able to do PCR and use gene editing tools such as CRISPR/Cas9 because of his work. Subsequently, he studied the structure of rhodopsin, the visual pigment in the eye and related proteins. Apart from the Nobel, Dr. Khorana received many awards and honors. Notable among them were Elected Member of the US National Academy of Sciences; Member of the American Academy of Arts and Sciences; Member of the Royal Society; Lasker Foundation Award for Basic Medical Research; Paul Kayser International Award of Merit in Retina Research; Golden Plate Award of the American Academy of Achievement. Dr. Khorana died on November 9, 2011, at the age of 89 in Concord, Massachusetts. At that time, he was survived by only two of his three children. His daughter Julia Elizabeth wrote about his life as a professor: “Even while doing all his research, he was always really interested in education, in students and young people.” Dr. Khorana led a purposeful life with added values.

Contributed by: Bellamkonda K. Kishore, M.D., Editor-in-Chief of JAAPI

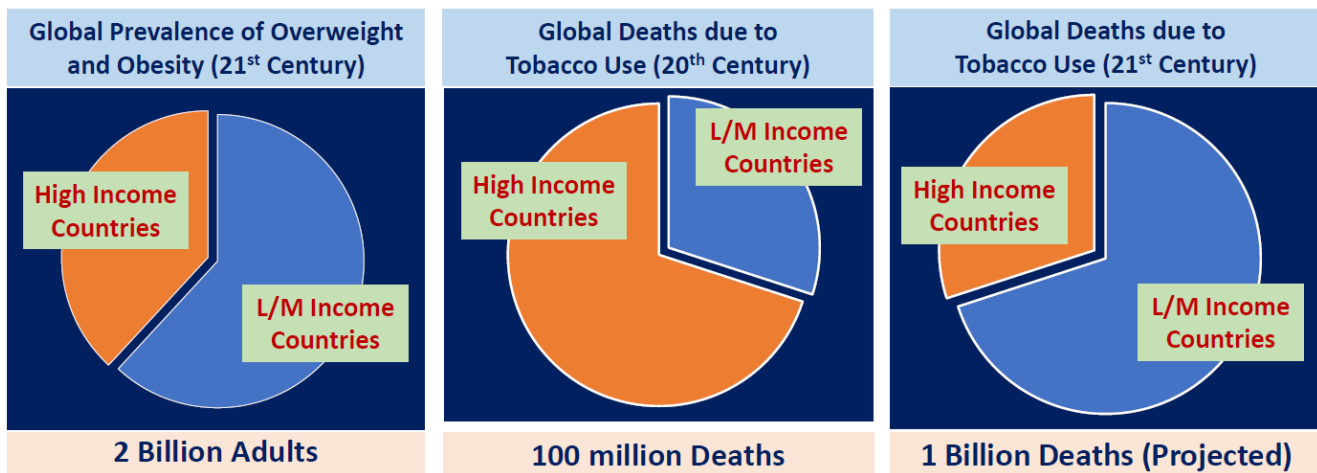
From the Editorial Desk

Two Man-Made Barriers for a Healthy World in the 21st Century

Bellamkonda K. Kishore, M.D., Ph.D., MBA

Editor-in-Chief of JAAPI

At a time, we are enthusiastically looking forward for the ushering in of Artificial Intelligence (AI), which has the power and potential to “flatten the world” in healthcare sector, similar to what mobile phones did in the communication sector, we are facing two challenging man-made barriers for a healthy world in the 21st century - *overweight/obesity and tobacco use*. Unfortunately, these two are not only creating frustrating road blocks to our genuine efforts to create a healthy world but are also dividing the global community into two distinct groups. This is not acceptable for us.



Pie charts prepared based on different sources

As shown in the above pie charts, right now the prevalence of overweight/obesity and deaths due to tobacco use are distinctly the problems of low- and middle-income countries (LMIC). These are the places where people face disproportionately heavier health burden due to socioeconomic conditions and lack of matured or well-developed healthcare delivery systems. These in turn result in markedly increased human suffering due to morbidity and mortality. As expounded in the following, the medical profession is becoming a helpless witness in this process.

Overweight/Obesity: Globally there are 2 billion overweight subjects (BMI > 25), of which 600 million are obese (BMI > 30). A vast majority of these subjects are living in emerging economies (BRICS countries) and in developing countries in Asia, Africa, and South America. No wonder these are also the places where the prevalence of diabetes mellitus, hypertension, cardiovascular and cerebrovascular disorders with acute events, chronic kidney disease and other non-communicable diseases are rising steeply. These populous countries simply cannot afford to bear the rising costs of healthcare. During the COVID-19 pandemic the governments of many of these countries were economically crippled bearing the increased costs of healthcare. They cannot sustain themselves in that high gear for longer periods.

We teach about food pyramid and healthy eating to children in the schools. But in the real-world scenario, the federal government subsidies for different foods do not match to that food pyramid. For instance, the most highly subsidized crops are corn, soy, wheat, and rice, which are often consumed as ultra-processed foods, but not whole grains foods. Sugar production is also highly subsidized as indirect price support. Ironically, fruits and vegetables, which fill the bottom of the food pyramid receive relatively little subsidization (1). Unlike the above grains, fruits and vegetables are easily perishable, thus raising their prices in the grocery stores. The subsidized agriculture produces are often packaged into high carb and low-cost unhealthy foods sold in large quantities in places like Walmart. A study published in the Journal of Urban Economics documented that an additional Walmart Supercenter per 100,000 residents increases average BMI

by 0.24 units and the obesity rate by 2.3% points (2). Although researchers and policy makers have argued that levying more taxes on obesity-promoting foods combined with subsidies on healthier foods on the shelf may combat obesity epidemic (3), this approach may not affect all demographics. The best approach seems to regulate the agricultural subsidies by the federal government in a health promoting manner, as once the cat is out of the bag at the farm, it is difficult to put it back into the bag by the consumers. Due to the globalization of processed food market, these obesogenic foods are available in many parts of the world at affordable prices, where they are consumed in preference to healthy home-made foods. Much needs to be done by the respective governments in these countries to correct this aberration in the food industry.

Finally, it is alarming to see the huge differences in premature all-cause mortality due to high BMI obesity over a 30-year period (1990-2019) among different age groups between the United States and India (4). Note the values shown for India in green boxes are lower than the corresponding values for the USA in 1999 but rose enormously by 2019. This rapid rise in India may continue unless some drastic measures are taken to contain it.

Premature Deaths from High BMI Obesity by Age in 1990 and 2019 (Both Sexes)						
	14-49 Years		50-69 Years		70 + Years	
	USA	India	USA	India	USA	India
1990	17,541	23,305	86,869	60,546	127,735	25,204
2019	21,066	96,119	139,865	298,503	232,975	184,466
Change	20%	312%	61%	393%	82%	632%

These data are in line with those documented for rise in the prevalence of obesity related NCDs within a short span of 3 years in data collected via Apollo’s ecosystem as presented by Sriram associates in this edition of JAAPI.

Tobacco Use: During the 20th century, most tobacco users were in the high-income countries. But now, most tobacco users are in LMIC. This shift in prevalence of tobacco use will have serious consequences on mortality rates. As shown, during the 20th century deaths due to tobacco use were 100 million. But during the 21st century, it is projected that number will be 1 billion (10-fold increase). This huge increase may be directly related to the lack of mature healthcare delivery systems and socioeconomic conditions in the LMIC. Whatever it may be, that we cannot prevent this man-made barrier is alarming. In May 2023, on the eve of World No Tobacco Day, the World Health Organization (WHO) urged governments to stop subsidizing tobacco farming and support more sustainable crops that could feed millions (5). The governments of emerging economies and developing nations should heed this urge by the WHO. As presented in the accompanying Editorial Perspective by Drs. Niharika Khanna and Colleen Kernan, apparently the predatory marketing practices by tobacco products manufacturers are creating barriers to fight against increasing tobacco use worldwide.

Synergistic Effects of Obesity and Tobacco Use: There are about 9 million smokers in the United States, who are obese. While smoking does not cause weight loss, smokers gain weight when they quit their habit. There is a synergistic effect of smoking on health risks due to obesity, causing poorer health. Smokers may also have more central fat accumulation and insulin resistance than non-smokers (6). The Framingham Heart Study with follow up from 1948 to 1990 revealed that obese smokers (both men and women) lost about 13 years of life (7). So, obese subjects should be encouraged to quit smoking and smokers should be advised to lose weight or avoid gaining weight.

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Editorial Perspective

Tobacco Advertising to Youth Does Exposure to Predatory Marketing Matter?

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Introduction: Tobacco industry has long been one of the most powerful industries in the United States with dual control over all tobacco and nicotine products, and also as significant partners and owners of the alcohol industry. Tobacco and alcohol industry partnership has allowed the opposition of excise taxes, clean indoor air laws, advertising, and promotion constraints under the guise of coalitions supported by the alcohol industry (1).

Internationally, the health and economic burden of tobacco use is increasingly borne by low- and middle-income countries (LMIC). The WHO Framework Convention for Tobacco Control (WHO FCTC) was recognized as international law in 2005; as a public health tool it aims to reduce demand and restrict supply. There are 1.1 billion smokers in the world, of which 80% smokers live in LMICs. It is projected that tobacco related deaths will increase to 8 million globally annually by 2030, with 80% occurring in LMICs. Manufactured cigarettes comprise 92.3% of worldwide sales, although cigars, kreteks, bidis, waterpipes and chewing tobacco are also used. Worldwide there are 346 million adult and 13 million youth smokeless tobacco users, of which 86% live in Southeast Asia. Tobacco places a disproportionate burden on the poor and vulnerable groups, where access to care is poor, and tobacco diverts money away from household needs. Women's tobacco use in LMIC remains low due to cultural and economic factors (2).

Cigarette smoking continues to be the leading cause of preventable diseases and death in the US, with 480,000 people dying yearly from tobacco related chronic conditions (1). Public health measures in the US have been ongoing since the first Surgeon General's report in 1964 proclaiming tobacco is associated with lung cancer, lung disease, heart disease, and adversely affects pregnancies. This led to a cascade of events including a ban on radio and television advertising in 1969, health warnings on

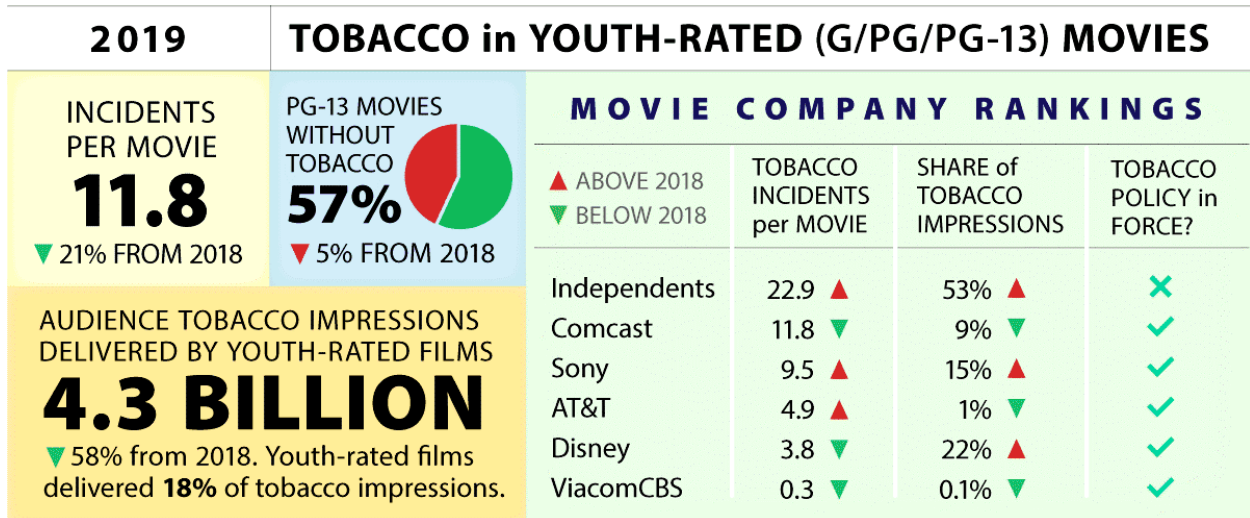
cigarette packages since 1970, tobacco taxation, clean air policies, new regulations, and the Family Smoking Prevention and Tobacco Control Act (FSPTCA) in 2009 (3). This act specifically restricted marketing tobacco products to minors and gave the FDA (Food and Drug Administration) authority to enforce restrictions on sales to minors and vending machine sales to minors (3). In addition, the FDA has restricted the sale of flavored tobacco products specifically those that appeal to youth. In response to this the FDA included Nicotine under the jurisdiction of the FSPTCA in 2022, and the tobacco industry has responded with new inventions.³ In 2009 the passage of the Tobacco Control Act gave the FDA the authority to regulate tobacco products. In 2022 Congress passed another Federal Law to grant FDA authority to regulate all tobacco products containing nicotine from any source, including synthetic nicotine (4).

The tobacco industry has decades of experience in marketing tobacco products to entice new users each year, specifically focusing on women, youth, and minority groups. The money spent to advertise the tobacco products in 2019 was \$8.2 billion dollars, of which \$7.62 billion was spent on cigarette advertising and promotion by the four major US cigarette companies. The five major smokeless tobacco manufacturers spent \$576 million. The most marketed and the most popular cigarettes to middle and high school children are Marlboro, Newport, and Camel (5). Amongst cigar brands, the most popular three brands are Swisher Little, Swisher Sweets, and Black and Mild. About 11.5% of US adults smoked cigarettes: with 13.1% men and 10.1% women; and each day 1600 youth tried their first cigarette (5, 6). Women are also targeted by tobacco companies, and this has likely given white women the highest rates of lung cancer among all women, whereas amongst men, non-Hispanic Black men have the highest incidence (6, 7). One of the important marketing venues are movies where major actors may casually puff a

cigarette with the branded cigarette box clearly in sight, chew tobacco, or vape using an identifiable device. The

Motion Picture Association rates the tobacco incidents in G/PG/PG-13 rated movies as depicted below:

Figure 1: Motion Picture Association dashboard for Tobacco Incidents in movies 2019 (8)



The Surgeon Generals’ Report concluded that exposure to onscreen smoking in movies causes young people to start smoking (9).

Tobacco Advertising to Youth – Does Exposure to Predatory Marketing Matter? The tobacco industry introduced ENDS (Electronic Nicotine Delivery System) in 2006 in the US as a cessation device for adult populations, receiving a lukewarm welcome from the US population. This led to a change in tobacco industry strategy, moving the advertising from older adults to youth in creative and interesting ways. The advertising of electronic cigarettes and vaping to youth became one of the most effective social media campaigns in history, leading to the uptake of ENDS by high school and middle school children at an alarming rate. Today, Maryland teenagers in high schools have 14.7% likelihood of using ENDS within the last 30 days, with this number rapidly increasing. The National Youth Tobacco Survey in 2021 suggests that 34% of high school and 11.3% of middle school children reported ever using any tobacco product. Teenage use of electronic cigarettes/vaping has become a public health crisis (10).

E-cigarettes are a 2.5-billion-dollar business in the US (11). E-cigarette design has evolved from cigarette lookalikes to sleek designs such as the JUULs over several generations (12). Youth e-cigarette use inclined sharply from 1.5% in 2011 to 20.8% in 2018 (12). E-cigarette usage grew approximately 900% among high school between 2011 to 2015, leading to a public health crisis (13). Data from the 2022 National Youth Tobacco Survey (NYTS) displayed over 3.08 million middle and high school

students had used at least one tobacco product in the past month, of which 2.5 million used e-cigarettes (14). Furthermore, E-cigarettes were the most used device (9.4%) (14). Currently, 16.5% of high school students and 4.5% middle school students use any tobacco product (14). This decrease is largely due to the anti-tobacco campaign and policies put in place by healthcare professionals and policy makers (15). Increased vaping rates among adolescents has unknown long-term consequences (13). One challenge for health professionals is e-cigarette companies that target adolescents with marketing campaigns utilizing social media popular with youth. As much as 78% of middle and high school students have been exposed to at least one vaping advertisement from 2014 to 2016 (16). Such advertisements include colorful packaging, abundant flavorings, and showed adolescents vaping to specifically target a younger population (17). The variety of flavors, specifically mango, berry, fruits, desserts, mint, and menthol entice teenagers into trying vaping for the first time (18). Novel devices (such as integration into bookbags, or smaller sizes) allow teenagers to vape subtly, making it easier to vape at home, school, or other prohibited places.

A recent paper by Juul Labs suggests that NHIS (National Health Interview Survey) in 2019 found that adult use of ENDS is 4.5% overall, and 9.3% in young adults 18-24 years of age (19-21). Young adulthood is the primary

period for smoking initiation and progression, a period with high levels of risk-taking behaviors (19). The use of ENDS is most common in current or past smokers (20). This may mean that individuals using ENDS are most likely to

also smoke which allows tobacco/nicotine to be delivered through the lungs in two ways, thus compounding the ill effects.

Figure 2: CDC Reports that Over 3 million US Youth used a Commercial Tobacco Product in 2022 (22)



Federal law prohibited the marketing of cigarettes in all flavors, except menthol cigarettes, leading to an increase in the use of menthol cigarettes to 37% of all cigarettes sold in the US population (3, 22). In 2022 the FDA proposed to ban the sale of menthol cigarettes and flavored cigars, however that regulation has not yet been implemented.

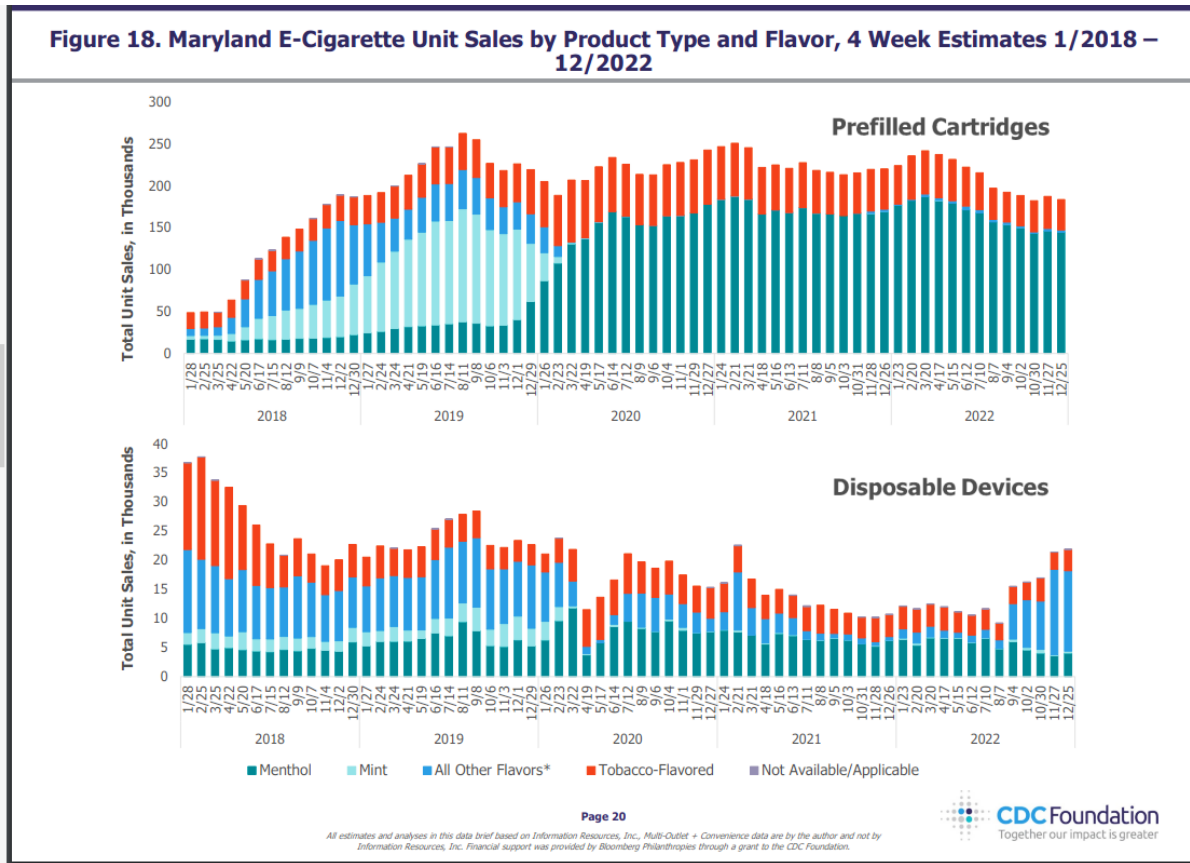
Advertising to Youth: Overall in 2019, the largest tobacco companies spent \$8.2 billion on advertising and promotional expenses in the US alone. The three most advertised brands, Marlboro, Newport, and Camel are the preferred cigarette brands by high school and middle school children (5). E-cigarettes industry spent \$125 million per year to advertise their products, encouraging youth use (11). Specifically, the use of flavors and the "coolness" has resulted in 68% of high school users using flavors such as menthol, fruit, alcohol, chocolate, candy, and sweets (11). Recent legislation banning flavors in prefilled cartridges in Maryland in January 2020 demonstrates the impact and shift to menthol amongst all users. (Figure 3).

Truth in Tobacco Advertising: Organizations such as the Truth Initiative target adolescents and spread facts about the dangers of smoking, vaping, and nicotine with a hope to dissuade them from using e-cigarettes (23). In one study, researchers determined that e-cigarette/vaping-associate lung injury (EVALI) awareness can affect vaping related behavior among young people. They found that EVALI awareness is associated with perceived risk of lung injury, strong sense of belief that e-cigarettes have hazardous chemicals, and that e-cigarettes are detrimental to health (24). Youth education on the dangers of EVALI may encourage and motivate young individuals to not use e-cigarettes. Furthermore, according to the 2022 NYTS there are certain students who are more likely to use any tobacco products. Results showed non-Hispanic American Indian or Alaska Native students were used tobacco products at the highest rate (13.5%) compared to any other ethnic counterparts (14). Furthermore, students identifying as lesbian, gay, or bisexual and transgender also had high tobacco product use (16% and 16.6% respectively). Last, social influences also indicate tobacco use (14). Those students (18.3%) with poor mental health (symptoms of severe psychological distress), low family income (12.5%),

and low academic scores (27.2%) all had higher tobacco product use (14). Targeting these groups with e-cigarettes and EVALI education may help significantly in reducing tobacco use and improve lung health among adolescents.

The FDA also proposes to target minority youth groups with additional anti-vaping advertising such as “Next Legend” targeting Native (American Indian and Alaska Native) youth.

Figure 3: State of Maryland E-cigarette Sales by Product Type and Flavor, 2018-2022
A Flavor ban was implemented for Prefilled cartridges in January 2020 (not disposables)



Resources available for all youth and adults who vape are through the national Quitline, 1-800-QUIT-NOW (1-800-784-8669) at no cost to the patient. Additional resources including text supports are available through the Quitline and through state departments of health, health systems, some private entities, and private and public insurers (25).

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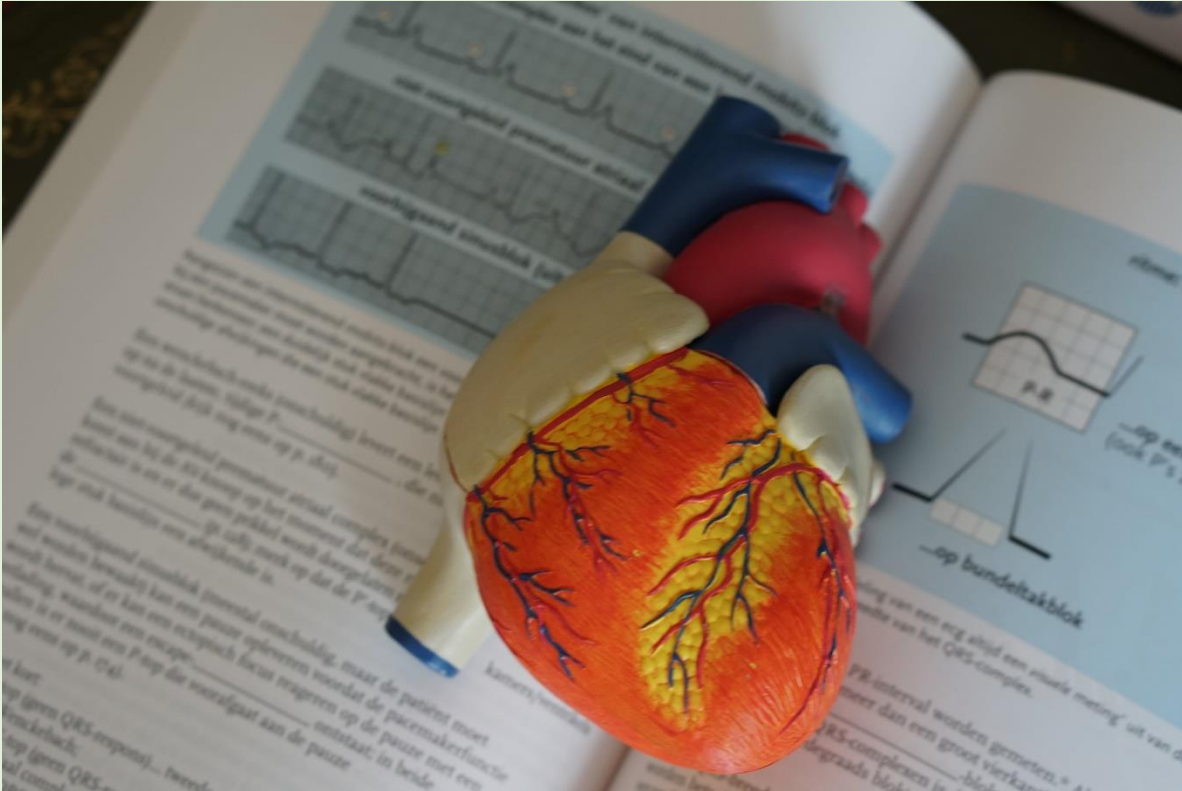


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Case Report

Water-immersion Technique for Endoscopic Decompression in a Female Patient with Sigmoid Volvulus

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Highlights:

- Colonic volvulus (sigmoid>cecal) typically presents in 6th to 8th decade of life and accounts for 10-15% of large bowel obstructions.
- CT scan is the most sensitive imaging modality to diagnose sigmoid volvulus.
- Endoscopic decompression is the initial management of choice, but recurrence is common.
- Sigmoid colectomy is the surgery of choice and preferably performed in the same admission.
- We present a female patient with sigmoid volvulus who was successfully treated with endoscopic decompression using water-immersion technique.

Key Words: Sigmoid Volvulus, Endoscope, Water-immersion, Endoscopic-decompression, Intestinal Obstruction

Introduction: The obstruction of large bowel constitutes one-fourth of all intestinal obstructions (1). Large bowel obstruction can be classified as mechanical (colonic volvulus, malignancy) or functional (pseudo-obstruction). Of these, colonic volvulus is the predominant cause for benign mechanical colonic obstruction. In large bowel, volvulus usually involves either cecum (25%-40%) or sigmoid colon (60%-75%).

Sigmoid volvulus results due to twisting of a long, redundant sigmoid colon around its mesentery. This results in obstruction with or without impairment of vascular perfusion depending on the degree of torsion. The predisposing factors for sigmoid volvulus include chronic constipation, long redundant sigmoid colon, colonic dysmotility and prior abdominal surgery (1). Females are relatively spared due to lax abdominal wall musculature and roomy pelvis which facilitates spontaneous detorsion of volvulus. Sigmoid volvulus is extremely rare in young females especially those with no predisposing factors (2, 3). Patients with sigmoid volvulus usually present with insidious onset pain, abdominal

distension, constipation, and vomiting. Uncommonly, acute onset pain has also been reported in a small proportion of patients. The diagnosis is established by pertinent history, physical examination and imaging including plain radiograph, contrast enema and computed tomography (CT). In patients with no clinical and radiological suspicion of ischemia or perforation, flexible endoscopy is the first line to decompress the sigmoid colon. Whereas urgent surgery is recommended where endoscopic detorsion fails or there is evidence of perforation. Here report, we discuss the clinical presentation, diagnostic evaluation, and endoscopic management of sigmoid volvulus in a young female.

Presentation: A 32-year-old female presented to our center with complaints of pain abdomen, abdominal distension, and inability to pass flatus and motions for one day. Examination revealed distended abdomen with a tympanic note over left lumbar and iliac region. There was no guarding, rigidity or rebound tenderness and the vital parameters were within the normal limits. Imaging including erect X-ray abdomen and computed tomography suggested sigmoid volvulus (Figure 1 and 2).

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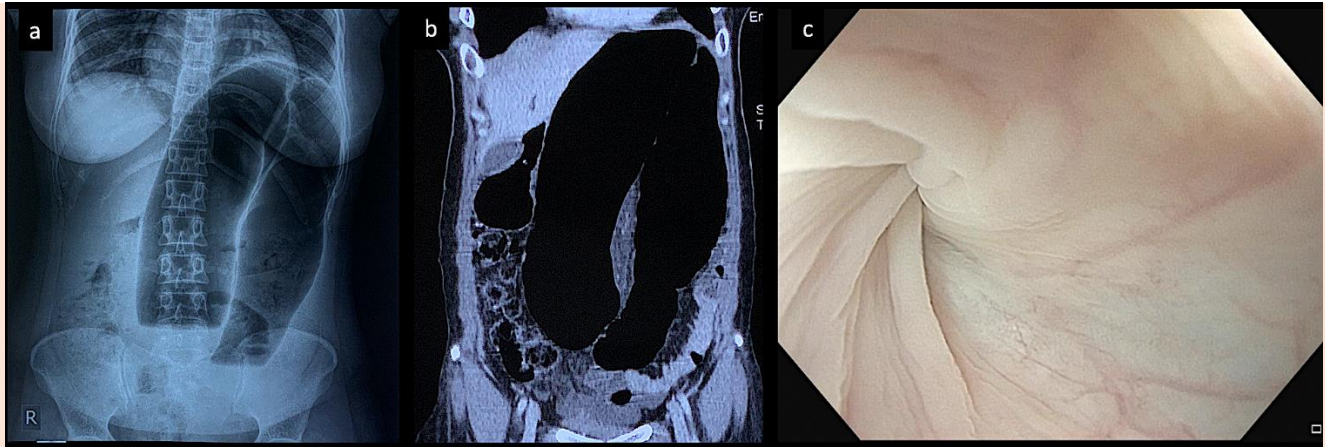


Figure 1. Radiological and endoscopic images in a case with sigmoid volvulus. **a.** X-ray abdomen revealing classical coffee bean sign suggestive of sigmoid volvulus; **b.** CT image revealing dilated loops of sigmoid colon; **c.** Endoscopic view of twisted and narrowed segment of sigmoid colon.

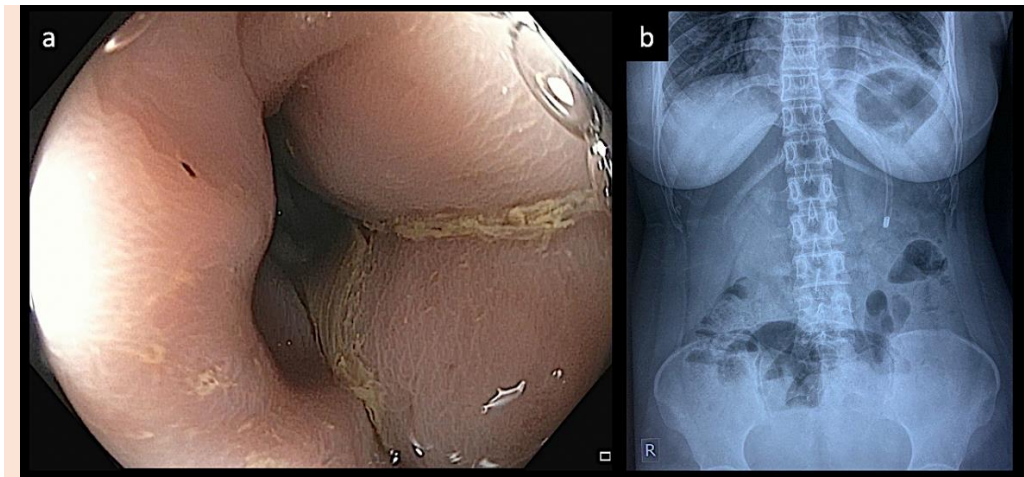
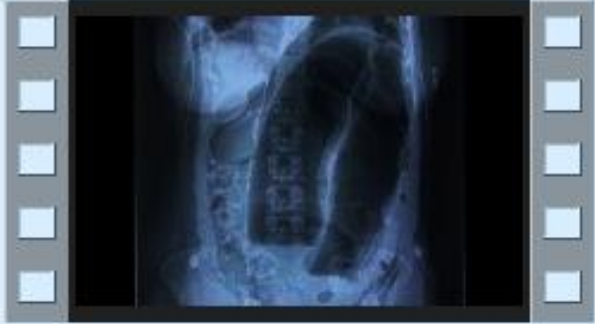



Figure 2. Imaging of the same case after colonoscopic decompression. **a.** Endoscopic view revealing opening up of the previously narrowed segment of colon; **b.** X-ray abdomen showing resolution of pre-decompression abnormalities.

Urgent colonoscopic decompression was planned for this patient (Supplementary Video 1). Colonoscopy revealed an empty rectum and narrowing with twisting of the colon near recto-sigmoid junction. There was significant resistance to passing colonoscope across the twisted segment of colon. In this case, we utilized a water immersion technique to facilitate endoscopic de-rotation of the sigmoid volvulus. The colon distal to the narrowed segment was filled with water using the water jet facility accompanying the colonoscope. Subsequently, the colonoscope was gradually advanced under continuous water irrigation. Finally, the colonoscope was gently

negotiated across the twisted colonic segment. The colon proximal to the narrowed segment was grossly dilated. Under minimal insufflation, the intraluminal air and liquid fecal matter was aspirated, and the scope was withdrawn. There was immediate improvement in the clinical symptoms and radiological findings after colonoscopic decompression (Figure 3). Thereafter, a flatus tube was inserted for continued decompression and to facilitate bowel preparation. The patient underwent sigmoid colectomy in the same admission and thereafter, no further episode was reported.



sigmoid volvulus



<https://www.dropbox.com/s/netltkv0920vjix/sigmoid%20volvulus.mp4?dl=0>

Supplementary Video 1: Water immersion technique for the decompression of sigmoid volvulus. Use the QR code or the URL to open and watch the video in dropbox.

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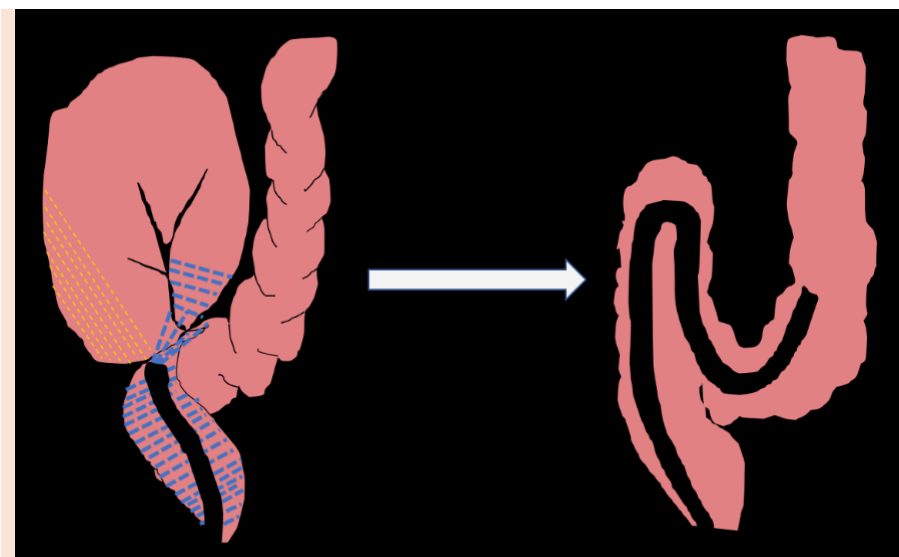


Figure 3. Water immersion technique of sigmoid volvulus decompression

Discussion: Sigmoid volvulus is not an uncommon cause of intestinal obstruction especially in elderly males (4). It involves the torsion or twisting of a redundant loop of sigmoid colon around its mesentery. The clinical presentation consists of insidious onset continuous pain in abdomen interspersed with bouts of colicky pain, abdominal distension, constipation, and obstipation. Unlike small bowel obstruction, vomiting is a late symptom in cases with volvulus. Up to 25% patients may acutely present with or without signs and symptoms suggestive of peritonitis. Physical examination reveals a distended and tympanic abdomen with or without tenderness. Rectum is often empty on digital rectal examination. Our case is unique in two aspects. First, it occurred in a young female without history of prior abdominal surgery. Second, the presentation was acute unlike the insidious onset in majority of the cases diagnosed with sigmoid volvulus.

The diagnosis of sigmoid volvulus relies on pertinent clinical presentation and imaging. Plain abdominal radiograph is often the initial imaging in hemodynamically stable patients. Abdominal radiographs typically reveal a dilated colonic loop resembling coffee bean or bent inner tube (Figure 1 a). A diagnosis of sigmoid volvulus can be

established on plain radiographs in 60% - 80% cases. Water soluble contrast enema is another useful imaging modality for confirming the diagnosis. However, with the availability of CT the use of contrast enema has fallen out of favor. CT abdomen with or without rectal contrast is the most sensitive test (100% sensitivity) for establishing the diagnosis of sigmoid volvulus. CT is indicated to confirm the diagnosis and to rule out other conditions that mimic sigmoid volvulus like colonic pseudo-obstruction and malignancy. On CT, a whirl sign representing torsion point of bowel loops and mesenteric vessels is pathognomonic (Figure 1 b).

The management of sigmoid volvulus is dictated by the vital status of the patient and presence or absence of perforation or peritonitis (Figure 4). The guidelines by the American Society of Colon and Rectal Surgeons (ASCRS), the World Society of Emergency Surgery (WSES) and the American Society of Gastrointestinal Endoscopy (ASGE) recommend endoscopic decompression as the initial management in hemodynamically stable patients without clinical and radiological evidence of perforation or peritonitis (1, 5, 6) (Table 1).

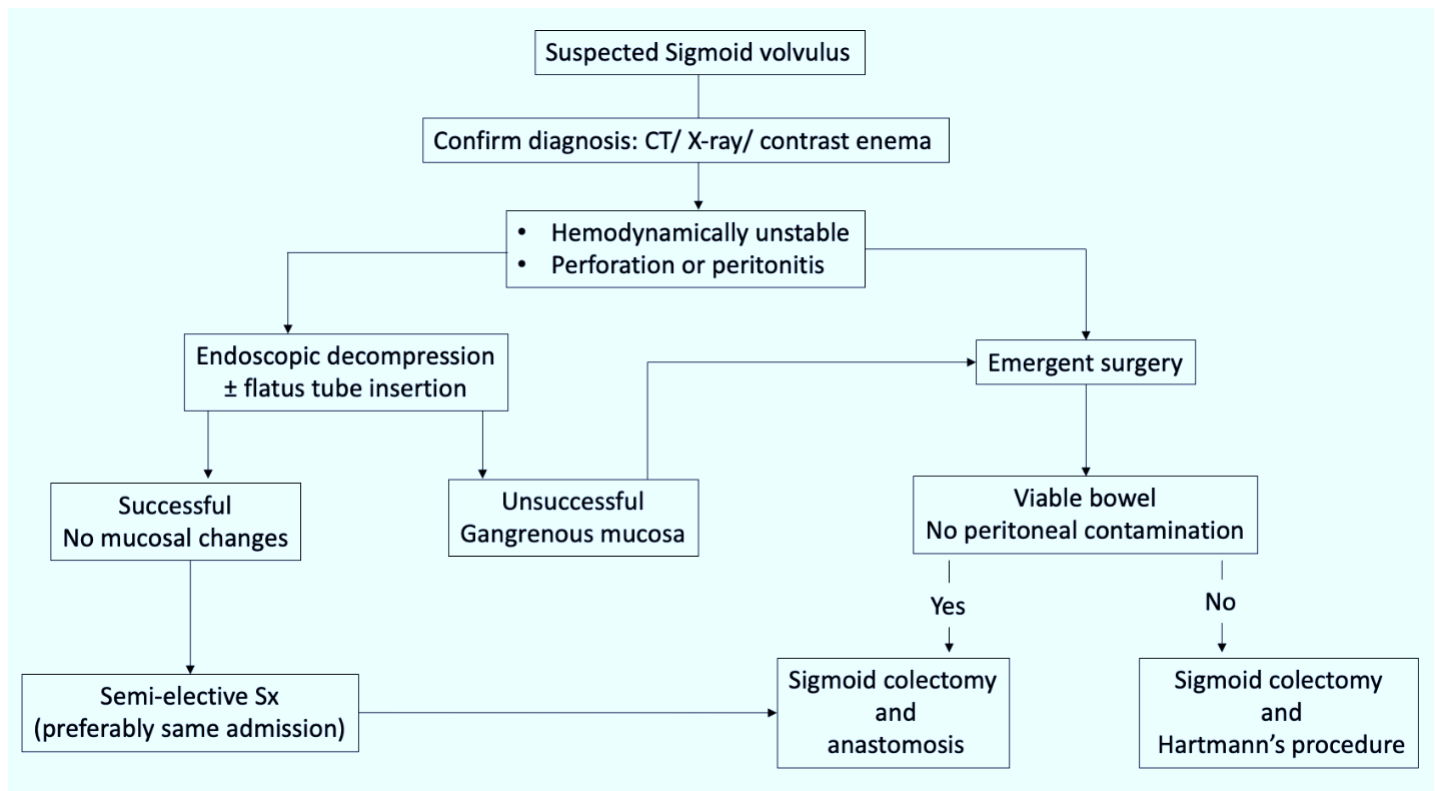


Figure 4. Algorithmic approach to the management of sigmoid volvulus

Table 1. Societal Guidelines for the Management of Sigmoid Volvulus

ASCRS Guidelines, 2021 (6)		ASGE Guidelines, 2020 (1)	
1.	Patients without hemodynamic instability, peritonitis, or evidence of perforation should typically undergo lower endoscopy to assess sigmoid colon viability, detorse the anatomy, and decompress the colon.	In patients with uncomplicated sigmoid volvulus, endoscopy is recommended as the initial treatment modality. After successful detorsion, placement of decompression tube should be considered to maintain reduction and decrease recurrence	
2.	Urgent sigmoid resection is indicated when endoscopic detorsion of the sigmoid colon fails and in cases of nonviable or perforated colon.	Surgical consultation should be considered during index admission given the high risk of recurrent volvulus and high morbidity and mortality associated with each episode	
3.	Patients who undergo successful endoscopic detorsion should be considered for sigmoid colectomy during the same hospital admission to prevent recurrent volvulus.	In patients with overt perforation or signs of peritonitis, surgical management is recommended.	
4.	Operations without resection including detorsion alone, sigmoidopexy, and mesosigmoidoplasty are inferior to sigmoid colectomy for the prevention of recurrent volvulus.	-	
5.	Endoscopic fixation of the sigmoid colon may be considered in selected patients in whom operative intervention presents a prohibitive risk.	-	

ASCRS, the American Society of Colon and Rectal Surgeons; *ASGE*, the American society of gastrointestinal endoscopy.

Endoscopic decompression is successful in 70% - 90% of the cases (1, 7). During endoscopy the mucosa of the sigmoid colon should be carefully visualized for changes of ischemia or gangrene, the presence of which would warrant emergent surgery. The point of twist appears as a pinwheel on endoscopy. Minimal insufflation should be done during colonoscopic decompression to avoid barotrauma in an already overdistended loop of colon proximal to the obstruction. In our case, we utilized water immersion technique to decompress the proximally obstructed segment of colon (Figure 3). This technique has been reported previously from Japan for detorsion in a case with sigmoid volvulus (8). The main advantage of this technique is avoidance of barotrauma and no fear of seepage of gas across the obstruction which may worsen the distension if the endoscopic decompression is unsuccessful. After detorsion, a flatus tube may be placed for continued decompression as well as bowel preparation for any surgical intervention if indicated. The advantage of endoscopic decompression is that it provides immediate symptom relief and facilitates bowel preparation before

surgery. However, the major limitation is the high recurrence rate (40%-70%) after endoscopic detorsion (5). Therefore, surgery is recommended during the same admission to prevent recurrent volvulus.

The indications for urgent surgery are perforation, peritonitis, and failure of endoscopic detorsion. Sigmoid colectomy is the surgery of choice with acceptable morbidity and mortality rates. Other non-resectional surgical options (detorsion alone, sigmoidopexy, and mesosigmoidoplasty) should be avoided as a high (15%-20%) incidence of recurrence has been reported (6). In patients unfit for surgery, endoscopic fixation of sigmoid colon to anterior abdominal wall (percutaneous endoscopic colostomy) at several points appears to be a reasonable option (9). However, the data are limited and the procedure should be performed by those experienced in the technique due to potential for major complications, especially peritonitis.

Conclusion: Endoscopic decompression is a safe and effective treatment option in cases with sigmoid volvulus. However, successful decompression should be followed by surgery for optimal outcomes. Recurrences are uncommon after sigmoid colectomy.

Disclosure: Authors declare no competing interests.

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Editorial Commentary

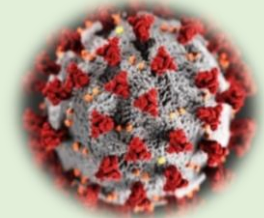


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One Health Saga

Commentary on the Review Article on Viral Zoonotic Disease from SHARE INDIA

Bellamkonda K. Kishore, M.D., Ph.D., MBA
Editor-in-Chief



SARS-CoV-2 Virus:
Courtesy CDC

After one hundred years, humanity experienced a devastating pandemic. But three things were very different between the two pandemics separated by 100 years. First, the world population during 1918 Spanish flu was less than 2 billion. Now, during the COVID-19 pandemic, the world population is four times larger, 8 billion. This resulted in rapid ecological changes due to shrinkage of forests, including rain forests, canopies, encroaching human activity into wilderness among others. Second, in 1918 international travel was very limited and civil aviation was just picking up. In contrast, by the time COVID-19 pandemic hit, civil aviation has become the common mode of transportation all over the world. So, the spread of infection was much rapid during COVID-19 than during the Spanish flu. Third, unlike during the Spanish flu, the culture of staying at home in isolation has gone and it became hard to implement it during the COVID-19. Thus, the world has changed while it is entering the age of zoonotic viral disease. What we witnessed recently is a combination of these two facts. It is just the beginning of that age, and we do not know what else we need to face. But one thing is certain. We are still not prepared and have no solid strategic plans to proactively predict or stop the pandemics at the early stage. The In-Depth Review Article by a group of physicians, scientists, and epidemiologists from SHARE INDIA in this edition of JAAPI highlights the need for **One Health** approach to combat the future pandemics due to zoonotic diseases.

According to the US Centers for Disease Control and Prevention, *One Health is a collaborative, multisectoral, and transdisciplinary approach — working at the local, regional, national, and global levels — with the goal of achieving optimal health outcomes recognizing the interconnection between people, animals, plants, and their shared environment (1)*. If One Health approach was implemented rigorously as soon as the world faced SARS-CoV epidemic in 2003, maybe we could have prevented or contained SAR-CoV-2 pandemic. No doubt we blinked, probably due to the low R_0 and low number of total deaths in SARS-CoV infected patients.

Hindsight is always 20/20. Professor Kate Jones, Ph.D. of the University College of London laid a clear picture of how intricately public health, biodiversity, and ecological balance are related to outbreak of pandemics such as the COVID-19 (2). Professor Jones, whose research investigates the interface of ecological balance and human health, with particular focus on emerging infectious diseases from animals, says a woeful lack of communication between the public health bodies and ecologists is failing to prevent spillover of animal diseases into human populations. She went on to add that it is not one solution for wildlife and one for humans. It is the same solution, which we now consider as One Health. According to Professor Jones, there were at least three papers in 2019 that said coronaviruses might be a real problem in South China. Before the emergence of SARS-CoV-2, Jones and her colleagues had repeatedly warned that environmental degradation around the world was increasing the likelihood of ‘spillover’ events and pandemics. It is time we start paying attention to such genuine voices and act in the best interest of the humanity or we may have to live on a Sick Planet forever. In this context, the In-Depth Review Article from SHARE INDIA is a timely and impactful one for the physician community to understand the breadth and depth of the problem we are facing as medical and healthcare professionals while working to combat devastating pandemics as the frontline soldiers.

1. CDC: One Health Basics. <https://www.cdc.gov/onehealth/basics/index.html>
2. Professor Kate Jone’s Research: <https://thebiologist.rsb.org.uk/biologist-interviews/there-were-at-least-three-papers-in-2019-that-said-coronaviruses-might-be-a-real-problem-in-south-china-3>

In-Depth Review Article

Viral Zoonotic Diseases in India:

A One Health Saga of Human, Animal, and Environmental Confluence

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Abstract: Zoonotic viral infections represent an important public health problem. These diseases pose serious risks to both animal and human health with an ultimate impact on livelihoods and economies. The recent upsurge in COVID-19 infections which caused a global pandemic has exposed our vulnerabilities and was a wakeup call to build resilient healthcare ecosystems globally. We have not only highlighted the global drivers of the emergence & re-emergence of zoonotic diseases but have also elucidated the Indian saga of management of viral zoonotic diseases at human-animal-environment interface through One Health approaches. To combat zoonotic diseases, a One Health approach dovetailed with public health measures that optimally thwarts ongoing or potential health threats at human-animal and environmental interface is the need of the hour.

Key Words: Zoonotic Diseases, One Health Approach, COVID-19, Viral Diseases, Reverse Zoonoses

Introduction: The world has seen that zoonotic diseases can cause pandemics. The World Health Organization (WHO) estimates that 25% of the 57 million annual deaths that occur globally are caused by microbes with a major proportion in the developing world (1). It has been identified that 1,415 species of infectious organisms are pathogenic to humans. These include 217 viruses and prions, 538 bacteria and rickettsia, 307 fungi, 66 protozoa and 287 helminths. Zoonoses constitute 868 (61%) of all known infectious diseases, with humans serving as the primary reservoir for only 33%. Of the 175 diseases considered emerging, 132 (75%) are zoonotic (2). The zoonotic diseases include viral (rabies, yellow fever, influenza, Kyasanur forest disease, etc.), bacterial (anthrax, brucellosis, plague, leptospirosis, salmonellosis, etc.), Rickettsial (tick typhus, scrub typhus, murine typhus, etc.), protozoal (toxoplasmosis, leishmaniasis, trypanosomiasis, etc.), helminths (hydatid disease, taeniasis, schistosomiasis, leishmaniasis, etc.), fungal (histoplasmosis, cryptococcus,

etc.) and ectoparasites (scabies, myiasis, etc.) (3). Emerging zoonotic diseases pose potentially serious impacts on human health and economies of nations. Their upwards trend is likely to continue.

AES	Acute Encephalitis Syndrome
CCHF	Crimean-Congo Hemorrhagic Fevers
CMV	Cytomegalovirus
COVID-19	Corona Virus Disease 2019
IDSP	Integrated Disease Surveillance Programme
JEV	Japanese Encephalitis Virus
KFD	Kyasanur Forest Disease
LCMV	Lymphocytic Choriomeningitis Virus
MERS	Middle East Respiratory Syndrome
NCDC	National Centre for Disease Control
PHEIC	Public Health Emergency of International Concern
RSV	Respiratory Syncytial Virus
SARS	Severe Acute Respiratory Syndrome
SARS CoV-2	Severe Acute Respiratory Syndrome Coronavirus 2
SFTS	Severe Fever Thrombocytopenia Syndrome
VRDLN	Viral Research and Diagnostic Laboratory Network
VZV	Varicella-Zoster virus
WHO	World Health Organization

Human activities carve the path to pandemics due to the unsustainable destruction of the environment and biodiversity that leads to an intermingling of humans, wildlife, livestock, and pathogens. Zoophytic diseases can happen due to the spill over of pathogenic organisms or the transmission of infections from animals to humans (zoonoses), from humans to animals (reverse zoonoses), or even from abiotic environmental reservoirs into vertebrates (Sapronoses) (4). Zoophytic disease emergence often occurs in stages, with an initial series of spill-over events, followed by repeated small outbreaks in people, and then pathogen adaptation for human-to-human transmission. Each stage might have a different driver, and therefore a different control measure is required (5).

The recent upsurge in zoonotic diseases shows that diseases can spill over into urban communities too. This is contrary to our prior beliefs about exotic pathogens' confinement to densely populated forests in developing countries with teeming population densities living in proximity with their livestock-pigs, chickens and ducks.

At least 37 pathogens emerged or re-emerged in India between 1992 and 2020 and the majority were of animal origin. Agriculture, animal husbandry workers such as farmers, livestock owners, animal handlers, veterinary extension workers and veterinarians have been found to commonly get infected with zoonotic diseases. Similarly, people engaged in the production and processing of livestock products such as personnel working in an abattoir, dairy, poultry enterprises and piggery suffer frequently from zoonotic diseases. Since zoonosis involves animals and humans, a "One Health" approach is essential to address both animal and human health in an integrated manner for global health security. In India, the National Centre for Disease Control (NCDC) is the key player to address zoonotic diseases through multi-sectoral and intersectoral approaches to strengthen surveillance and effective containment. Epidemic potential diseases are under surveillance by the Ministry of Health & Family Welfare, the Government of India's IT-enabled, laboratory-based, Integrated Disease Surveillance Programme (IDSP) (6). The network of laboratories designated as Virus Research and Diagnostic Laboratory (VRDLN) has infrastructure and diagnostic capabilities to identify viruses of public health importance with epidemic potential in India (7).

SARS-CoV-2 pandemic has revealed there were many significant weaknesses in global health security.

Leaders around the world marshalled the resources and commitment to look beyond the COVID-19 pandemic and build much stronger global health security for the future based on the principle of One Health. In this publication, we have put together global drivers of emerging and re-emerging zoonotic diseases along with a lucid narrative on preponderant viral zoonotic diseases in India that mandate strategic interventions to prevent potential infectious disease spillover at animal-human interface. Thus, progress towards global health security requires a greater focus on the interface between humans and animals and a strong collaboration between the human health and the animal health sectors. This paper provides mapping of zoonotic diseases as per Indian context which pools around human - animal and environment interface.

Global Drivers of Emergence & Re-emergence of Zoonotic Diseases: Many factors lead to the emergence of zoonotic diseases (Figure 1). The environment associated with pathogens and their reservoir hosts are constantly changing (8). The key factors driving the emergence and re-emergence of zoonotic diseases are explained below:

a) Human Factors: Population growth has been unevenly distributed around the globe and is expected to become even more so in the next few decades. With the current global population at 8 billion (9), skyrocketing population expansion with dense growth pockets creates a conducive environment for zoonotic diseases to thrive and spill over to humans. The spread of zoonotic diseases is likely to happen when there is increased population mobility. Human travel associated with tourism, business, and other moves has significant implications for human and animal health and are at risk of contracting communicable diseases. When visiting other countries, humans can act as vectors for delivering infectious diseases to a different region or potentially around the world, as in the case of SARS and COVID-19. Manmade modifications in an environment such as dams for hydroelectric power or canal building for transportation have multiplied breeding sites for disease vectors, the classical example being, *Aedes aegypti*, the mosquito which transmits dengue fever. Globalization has provided raw food from different cultures and regions to other cultures that contain raw meat or fish, and this can facilitate several parasitic zoonoses (10). Transplantation has resulted in several cases of zoonotic diseases infecting transplant recipients. Perhaps most widely cited instance was an

organ donor infected with rabies and transplanted organs subsequently infected & killed four transplant recipients (11).

- b) **Animal Factors:** Pet ownership increases the chances of zoonotic infection from several types of diseases (e.g., Salmonellosis, Giardia, Cryptosporidium, Toxoplasmosis and Rabies). The transnational trade of exotic animals from birds to non-traditional companion animals is growing and creating new challenges for both human and animal health professionals and demands their closer collaboration (12). The trade in wildlife has helped to introduce pathogens that threaten human and animal health, agricultural production, and biodiversity. The human-mediated introduction of infectious disease and vectors, termed “pathogen pollution” (13) is expected to continue to rise via future expansion of global travel and trade (14, 15). Handling animal by-products and waste are also known to spill over diseases to humans e.g., anthrax and tularemia.
- c) **Deforestation and Agriculture:** Deforestation led to several ecosystem consequences. Deforestation decreases the overall habitat for wildlife species and has implications for the distribution of many microorganisms and the health of human, domestic animal, and wildlife populations. Agriculture occupies most of the world’s arable land and uses over two-thirds of the world’s fresh water (16). The subsequent

increase in irrigation reduces water availability for other uses and increases breeding sites for disease vectors. Major changes such as new agricultural practices, modernization and intensification of farming systems and habitat clearing for cropping and grazing have fueled spillover of zoonotic diseases e.g., spread of Nipah Virus as a classic example of connecting the dots between emerging diseases and biodiversity loss (17). Increasing trade in bushmeat can heighten the risk of transmission if live animals are transported to centralized markets where diverse species are forced into close contact (18, 19).

- d) **Environmental Factors:** Climate models for greenhouse warming predict that geographic changes will foster several water-borne (e.g., cholera) and vector-borne (e.g., malaria, yellow fever, dengue, leishmaniasis) diseases (20).
- e) **Research and Innovation:** As research in animals continue, there is always a possibility of zoonotic disease among scientific staff responsible for the care of the animals, or in laboratory workers engaged in microbiological aspects of the disease. Examples include glanders, tularemia, Q fever, Venezuelan equine encephalitis and Herpes B (12). Many of the Centers for Disease Control, USA Category A, B, and C bioterrorism agents such as anthrax, plague, tularemia, brucellosis, and cryptosporidium are zoonoses (22).

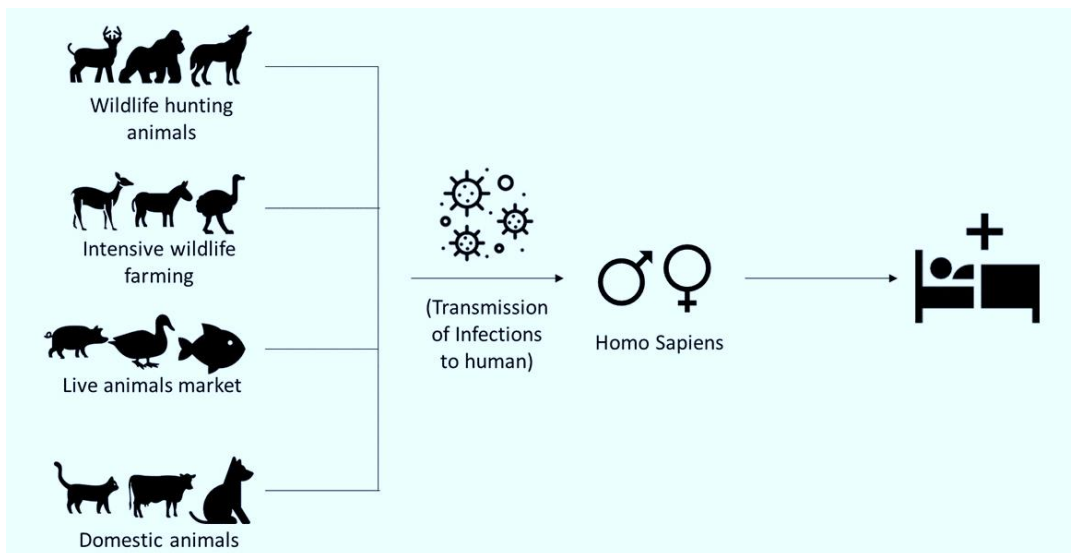


Figure 1: Zoonotic diseases have (re-) emerged due to intermingling at the animal-human interface. Transmission pathways include direct contact through handling of living animals (wildlife trade, domestic animals), preparation of slaughtered animals for consumption of meat or traditional medicinal uses.

Viral zoonotic diseases in India: A consistent theme in the infectious disease landscape of the country has been the periods of quiescence of several pathogens following their initial discovery, only to be followed by their reappearance in virulent forms. IDSP is a laboratory-based, IT-enabled system in the country which facilitates outbreak reporting and data analysis of disease surveillance through regional and national level from sub centers, primary health centers, community health centers, hospital including government and private sector hospital and medical colleges (23). IDSP monitors disease trends to detect and respond to outbreaks in early rising through trained Rapid Response Team. Their concerted efforts, increases the functionality of referral laboratory network across the nation in timely detection of epidemic prone diseases during outbreaks and fosters public health action through disease specific public health programs for timely action and management of index cases and contact tracing to curb transmission.

Recent IDSP data showed that 71% of outbreaks were caused by viral pathogens, while 29% were due to non-viral pathogens (23). Nearly 72,000 individuals were affected by these outbreaks, and amongst them, 60 percent had a viral etiology. The emerging/re-emerging viral zoonotic infections reported in India are described in Table 1 with some being critical for their potential in jumping the species barrier. For an effective One Health strategy in India, Ministries/ Departments of Health and Family Welfare, Drinking Water and Sanitation, Social Justice and Empowerment, Women and Child Development, Urban Development (Housing and Urban Poverty Alleviation) and Human Resource Development (Department of School Education and Literacy) actively engage.

Table 1: Emerging/re-emerging Viral Infections in India and New Viruses

Family	Viruses	Mode of Transmission	Outbreak Potential	Biosafety-risk Group
Bunyaviridae	Ganjam virus	Tick-borne	Yes*	2
	Bhanja virus	Tick-borne	Yes*	2
	Severe Fever Thrombocytopenia Syndrome (SFTS) virus	Tick-borne	Yes	4
	Chobar Gorge virus	Tick-borne	No	2
	Cat Que virus	Arthropod-borne	Yes*	2
	Kaisodi virus	Tick-borne	Yes*	2
	Umbre virus	Arthropod-borne	Yes*	2
	Oya virus and Ingwavuma virus	Arthropod-borne	No	2
	Chittoor virus	Tick-borne	Yes*	2
	Thottapalayam virus	Rodent-borne	No	2
Nairoviridae	Crimean-Congo Hemorrhagic Fevers (CCHF) virus	Tick-borne, human to human	Yes	4
Flaviviridae	Yellow fever	Arthropod-borne	Yes	4
	Zika virus	Arthropod-borne, mother-to-child, sexual route	Yes	2
	Kyasanur Forest Disease (KFD)	Tick-borne	Yes	4
	Japanese Encephalitis (JE)	Arthropod-borne	Yes	2
	Dengue	Arthropod-borne	Yes	2
	Bagaza virus	Arthropod-borne	Yes*	2
Paramyxoviridae	Influenza - H3N2	Airborne	Yes	3
	Influenza -Avian H5N1	Airborne	Yes	4

Table 1: Emerging/re-emerging Viral Infections in India and New Viruses				
Family	Viruses	Mode of Transmission	Outbreak Potential	Biosafety-risk Group
	Respiratory Syncytial Virus (RSV)	Airborne	Yes	2
	Quaranfil virus	Tick-borne	Yes*	2
	Parainfluenza 1-4	Airborne	Yes*	2
	Enterovirus-D68	Airborne	Yes	2
Paramyxoviridae	Nipah virus	Human to human direct contact/consumption of infected bat/fruit infected with bat	Yes	4
Picornaviridae	Human rhinovirus A, B and C	Airborne	Yes	2
	Hand, foot and mouth disease	Direct contact, faecal-oral route	Yes	2
	Coxsackie-A21 virus	Faeco-oral route	Yes	2
	Coxsackie-A10 virus	Faeco-oral route	Yes	2
	Sapovirus	Faeco-oral route	Yes	2
	Rotavirus	Faeco-oral route	Yes	2
	Polio and nonpolio flaccid paralysis	Faeco-oral route	Yes	3
Caliciviridae	Noroviruses	Faeco-oral route	Yes	2
Hepadnaviridae	Hepatitis virus new and vaccine escape mutants of HBV	Blood-borne	Yes	2
Togaviridae	Rubella virus	Airborne	Yes	2
	Chikungunya virus	Arthropod-borne	Yes	2
Poxviridae	Buffalopox virus (Orthopoxvirus)	Direct contact	Yes	2
Parvoviridae	Human parvovirus 4	Parenteral transmission	Yes	2
Arenaviridae	Lymphocytic Choriomeningitis Virus (LCMV)	Rodent-borne	Yes*	3
Herpesviridae	Cytomegalovirus (CMV)	Direct contact	Yes	2
	Chickenpox (varicella), Varicella-Zoster virus (VZV)	Airborne, direct contact	Yes	2
Rhabdoviridae	Chandipura virus	Arthropod-borne	Yes	3
Reoviridae	Kammavanpettai virus (Orbiviruses)	Tick-borne	No	Unknown#
* May cause an epidemic; however, no epidemic has been reported. # Unknown: No clear information on the risk assessment is available.				

If any infections of public health importance are notified, it needs to be assessed whether it is fulfilling the criteria of Public Health Emergency of International Concern (PHEIC) as per International Health Regulations (2005) guidelines (Figure 2).

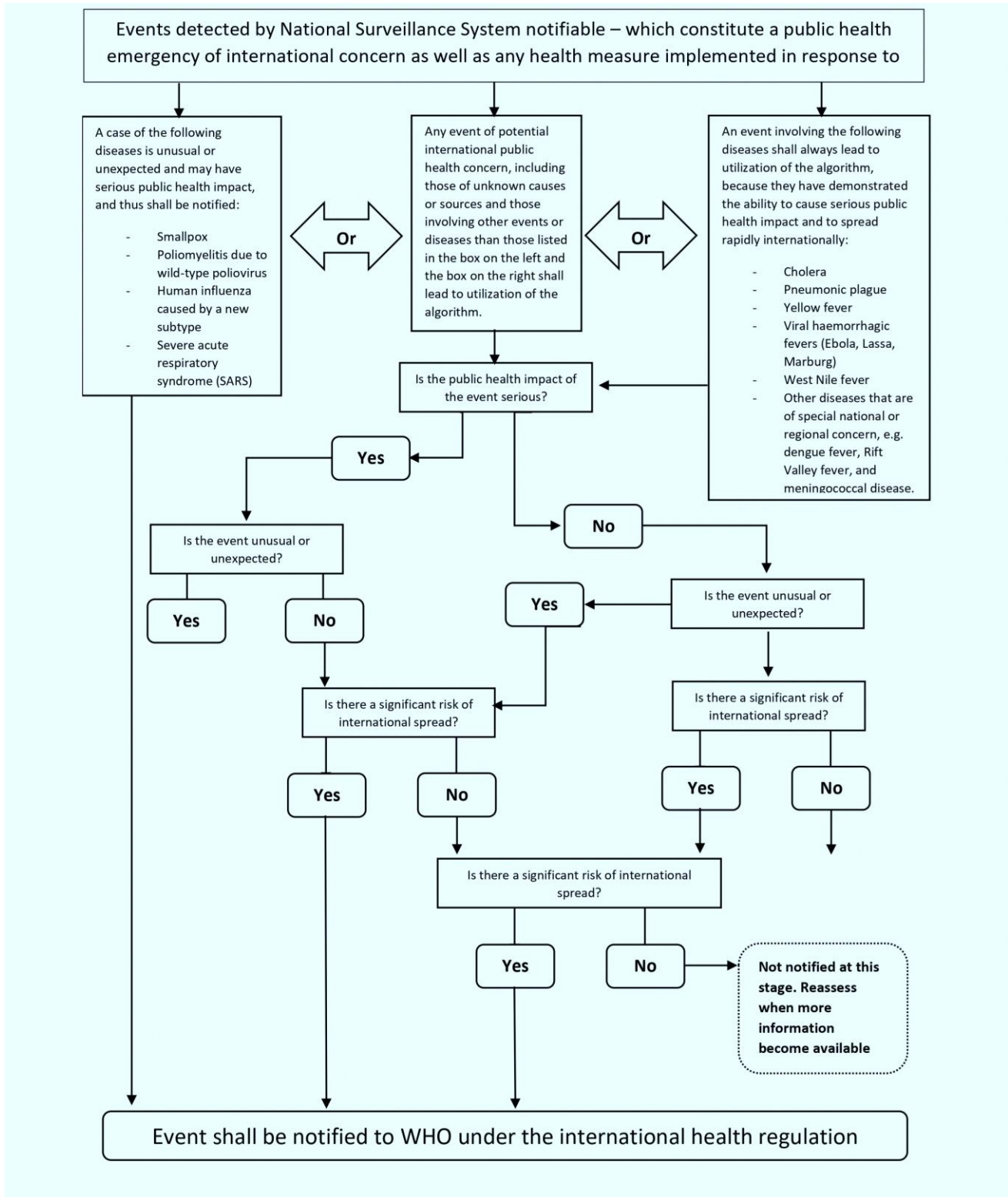


Figure 2: Decision making approach to public health emergencies. https://www.who.int/health-topics/international-health-regulations#tab=tab_1

The animals, humans, and environment are interlinked, resulting in several benefits as well as a spread of zoonosis and multifactorial chronic diseases. For successfully implementing the One Health model, integration, and collaboration between multiple sectors of agriculture, animal health, and human health is required. Here, we showcase successful implementation of One Health approaches to thwart public health menace of viral zoonotic infections in India:

1. Corona Virus Disease (COVID-19): An epidemic of COVID-19, triggered by SARS-CoV-2, caused great suffering to China in November 2019 (24). Commencing from the epicentre in Wuhan, Hubei province the infection rapidly became a pandemic that has affected all continents (25). In severe cases, cytokine storm causes acute respiratory distress syndrome, multiorgan failure and sepsis (26). The positive-sense single-stranded RNA virus spreads from person to person through aerosol and contact transmission (27). Respiratory infections caused by the Middle East Respiratory Syndrome (MERS) coronavirus and Severe Acute Respiratory Syndrome (SARS) coronavirus have higher mortality rates. However, SARS-CoV-2 spreads much more rapidly than the other two Coronaviridae members, probably because it is also transmitted through asymptomatic carriers, which renders containment a challenge (28). India reported its first case of COVID-19 in late January in the southern state of Kerala. As of May 3, 2023, India has tested 927, 239, 236 samples for COVID-19 (29). The fact that more animals are reported infected with the COVID-19 virus, warrants One Health approach is crucial to address the threats posed by new diseases to the health of people and animals. One lesson learned from COVID-19 is that emerging zoonotic infectious diseases are here to stay and fighting new disease including development of drugs, vaccines and therapeutics require multisector collaborations across organizations working in human, animal, and environmental health sectors.

2. Monkeypox Virus Disease: The 2022 monkeypox outbreak in India is a part of the ongoing outbreak of human monkeypox caused by the West African clade of the monkeypox virus. The outbreak was first reported in India on July 14, 2022. India was the first country in South Asia and the tenth globally to report a monkeypox case. India has reported twenty-two confirmed cases of monkeypox, as of 20 January 2023 (30). The disease is caused by the monkeypox virus, a zoonotic virus in the genus Orthopoxvirus. The requirements for a One Health

approach, should include consideration of land-use change and the bushmeat and exotic pet trades, to prevent opportunities for the emergence of monkeypox and diseases caused by other Orthopoxviruses. This also enables a rapid and effective response to any outbreaks to limit their spread.

3. Avian Influenza (Bird Flu): Avian influenza is an acute respiratory infection characterized by fever, cough and dyspnea. Pandemic flu viruses have some avian flu virus genes and usually some human flu virus genes. Both the H2N2 and H3N2 pandemic strains contained genes from avian influenza viruses. The first avian flu was detected in Italy in the early 1900. In India, the first cases were reported in Maharashtra in 2006. The poultry outbreaks have been reported from the north-eastern part of the country, near the border with Bangladesh: between January and April 2008 from West Bengal, in April 2008 and January 2012 from Tripura, in November and December 2008 from Assam, and again from West Bengal between December 2008 and May 2009. Recently, India reported its first case of human infection and death from Bird Flu (31). The H5N1 was labelled 'avian' influenza because it was first found in birds. It affects both wild and domesticated birds. According to the World Health Organization, between 2003 and 2014, the virus claimed 407 human lives globally. India saw outbreaks in 15 states between 2006 and 2015. The first confirmed case of human infection of influenza A (H5N1) virus was identified from Haryana state (31). As it is evident from the reported case there is transmission of avian influenza to humans in India, but there is a low likelihood of human-to-human transmission, sporadic cases of human infection with avian influenza viruses may be reported because these viruses have been occasionally detected in poultry populations in India (31). For the prevention and control of the Avian flu epidemic, strategy involves the One Health approach brainstorming and coming together of public health experts, medical consultants, veterinary doctors, bureaucrats, and environmentalists.

4. Nipah Virus Disease: Nipah virus infection is an emerging infectious disease of public health importance in the South-East Asia Region. Mingling between bats and human habitats, either due to urbanization or deforestation is the key driver of this spill over zoonotic disease. There were focal outbreaks of the Nipah virus in Bangladesh and India during winter in 2001. Drinking fresh date palm sap, possibly contaminated by fruit bats' excreta (*P. giganteus*) during the winter season, may have been

responsible for indirect transmission of the Nipah virus to humans (32). In September 2021, the Kerala State Health Department reported an isolated case of Nipah virus disease in India (33). This was the fifth outbreak of the disease in India. To control this outbreak, the state government applied the principle of One Health. A multi-disciplinary central team from the NCDC was sent to Kerala state to provide technical support. State authorities issued an alert to Mysuru, Mangalore, Chamarajanagar and Kodagu districts in Karnataka state, which border Kerala state to curtail spread of the viral disease.

5. Zika Fever: Zika virus was first discovered in 1947 in the rhesus monkey of the tropical Zika Forest in Uganda. The first human Zika Fever spillover was reported from Nigeria in 1954. On 1st February 2016, WHO declared Zika Virus Disease as a Public Health Emergency of International Concern (34). Zika virus is an arthropod borne flavivirus that shares the *Aedes* mosquito. India reported its first case in 2017 followed by 159 cases of Zika virus infection in Rajasthan (35, 36) and 127 in Madhya Pradesh (37) in 2018 with no neurological complication. The re-emergence of Zika Virus disease has highlighted spread of infectious diseases beyond geographical barriers due to growing globalization, increased travel and the universal presence of the *Aedes* mosquito. In July 2021, a Zika virus infection was laboratory-confirmed in India (38). In India, control of the Zika virus outbreak succeeded as the One Health approach was applied involving synergies between public health experts, clinicians, veterinary doctors, communication experts and other stakeholders.

6. Chikungunya Virus Infection: Chikungunya is a mosquito-borne viral infection characterized by severe, sometimes persistent joint pain (arthritis) with fever and rashes. Monkeys, and other wild animals, serve as reservoirs of the virus. It is mainly caused by the bite of infected *Aedes aegypti* and *Aedes albopictus* mosquitoes. The incubation period can be 2-12 days but is usually 3-7 days followed by clinical signs of fever, debilitating arthralgia (joint pain), swelling of joints, stiffness of joints, myalgia (muscular pain), headache, fatigue (weakness), nausea, vomiting and rash. It is rarely life-threatening. Chikungunya fever has interesting epidemiology, it shows a cyclical pattern of appearance and disappearance, of which major epidemics occur at an interval of 7-8 years and sometimes as long as 20 years between two episodes. During the 2005-2007 explosive epidemics in the Indian Ocean islands and India, anecdotal cases of Chikungunya-associated deaths, encephalitis and neonatal infections

were reported (39). In 2020, India has reported 5,159 confirmed and 32,287 suspected cases of Chikungunya with the disease being endemic in 32 provinces/union territories and dominant presence in Andhra Pradesh, Karnataka, Maharashtra, Madhya Pradesh, Tamil Nadu, Gujarat, and Kerala (40). There is neither a chikungunya virus vaccine nor drugs available to cure the infection. Prevention, therefore, hinges on avoiding mosquito bites, involving the One Health approach, source reduction method, use of larvicides and biological control of mosquitoes.

7. Japanese Encephalitis: Japanese Encephalitis (JE) is a mosquito-borne viral zoonotic disease of public health importance with epidemic potential and a high mortality rate. Japanese encephalitis virus (JEV) (Family-Flaviviridae) is the most common cause of childhood viral encephalitis in the world with about 50,000 cases and 10,000 deaths annually (41). JE was clinically diagnosed for the first time in India in 1955 at Vellore, Tamil Nadu. The longest and most severe epidemic of JE in 3 decades occurred from July to November 2005 in Gorakhpur, Uttar Pradesh, India. Overall, 5,737 persons were affected in 7 districts of eastern Uttar Pradesh, and 1,344 persons died (WHO 2005). The disease has been reported in 2007 in Assam (368 patients), Goa (44 patients), Tamil Nadu (17 patients), Manipur (11 patients), Karnataka (6 patients), Haryana (6 patients) and Kerala (1 patient) (42). Human cases were reported from all states except Dadra, Daman, Diu, Gujarat, Himachal, Jammu & Kashmir, Lakshadweep, Meghalaya, Nagar Haveli, Punjab, Rajasthan, and Sikkim. From Ardeid birds (pond herons and cattle egrets), JE infection is transmitted by mosquitoes to pigs/ducklings. Humans or cattle get infected either by birds or pigs/ducklings through a mosquito bite. Despite the best laboratory facilities and practices, the JE virus cannot be isolated easily from clinical specimens, apparently because of low levels of viremia and the rapid development of neutralizing antibodies. Hence, the diagnosis is usually based on the presence of antibodies, using techniques such as IgM capture ELISA for serum and CSF. These have become the accepted standard for diagnosing JE (43). The Ministry of Health & Family Welfare, India has been taking various prevention and control measures against Acute Encephalitis Syndrome (AES). The problem resolution entailed a synergistic association amongst stakeholders to overcome broader development and rehabilitation challenges rather than merely a medical problem, embedded in One Health strategy.

In the world of global health challenges today, One Health approach has emerged one of the ideal ways to create regional and national animal surveillance systems which are well coordinated with strong public health systems. This approach is paramount in the formulation and implementation of animal health policies and programs to control animal diseases and possible human spillover. To enable this, early detection and diagnosis of zoonotic diseases is needed, which can be done with the support of necessary scientific and technological expertise as per international standards and guidelines. Veterinarians, Entomologists, Surveillance Staff, Epidemiologists, Microbiologists, Clinicians, Pharmacists, Environmental Health Staff, Emergency Preparedness Staff and health care workers-Public Health Nurse, Infectious Disease Program Staff, Medical and Laboratory Staff act as first line of defense against the zoonotic diseases. State and District Surveillance Units are involved in regular and timely data collection, analysis and making actionable recommendations. As part of disease surveillance, a syndromic diagnosis is made by paramedics and community health workers. The Medical Officer of community health centers/district hospital/urban hospitals/medical colleges and physicians in private health facilities make a presumptive diagnosis based on patient history and clinical symptoms. They trigger requests for confirmed diagnosis based on positive laboratory identification and are responsible for patient management and emergency response based on outbreak investigations and surveillance reports.

Conclusions: The factors which influence the emergence and re-emergence of zoonotic diseases are multifaceted and need to be handled through a collective and comprehensive strategy. The One Health approach is increasingly gaining attention as the standard approach globally to combat emerging infectious diseases and zoonotic threats. The increasing trend of zoonotic virus emergence in recent years brings in the need to implement an integrated One Health approach which would enable proper outbreak investigation, control, and prevention. Governments, health workers and scientists need to collaborate at every level, work in tandem and nurture and maximize One Health practices so we can be more effective in our future fight against emerging and re-emerging zoonotic diseases. A comprehensive strategy and policy on infectious disease containment and prevention needs to be developed at the national level that would involve all relevant sectors both governmental and nongovernmental. Apart from strengthening surveillance

systems, building rapid response mechanism, ensuring compliance with International Health Regulations, building capacity in epidemiology, strengthening laboratory network, working on basic, translational, and applied research, and fostering information sharing between all the stakeholders is needed to meet the threat of emerging and re-emerging infections.

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Call for Articles on Asian American Healthcare Issues



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It has been well documented that Asian Americans, especially the South Asians, have higher prevalence of cardiovascular diseases and face higher cardiometabolic risk. This is attributed to several factors, including genetics. On May 10, 2022, the Newsroom of the American Heart Association pointed out that “one-size-fits all” is flawed for assessing cardiovascular diseases risk among Asian Americans. In view of the above, starting from Spring 2022 Edition, JAAPI has a section dedicated to **Asian American Healthcare Issues**. We welcome articles on all aspects of Asian American or South Asian healthcare under this section.

Perspective Article

Tackling the Rising Tide of Non-Communicable Diseases in India: Apollo Hospitals' ProHealth Data

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Abstract: The burden of non-communicable diseases (NCDs) in India is on the rise, posing significant challenges to public health. This article offers key insights drawn from routine data collected via Apollo's ecosystem as part of their preventive health checks across all centers and findings from specific research studies conducted at various Apollo centers, which are currently at different stages in the publication process. This perspective highlights the increasing prevalence of NCDs, regional variations, the impact of sleep disorders and mental health on NCDs, and the significance of regular, personalized screening. It emphasizes the need for a multi-pronged approach to tackle India's NCD burden, including, personalized treatment and prevention, geographic-specific strategies, genetic counseling, attention to sleep and mental health, and integration of community-based models. Collaboration, education, technology, and addressing social determinants of health are crucial for reducing the burden of NCDs in India.

Key Words: Non-communicable Diseases, NCDs, Preventive Healthcare, Personalized Screening, Community-based Models, ProHealth

Introduction: India faces a growing public health challenge as non-communicable diseases (NCDs) continue to rise in prevalence. In 2016, NCDs accounted for three of the top five causes of disease burden in the country (1). The proportion of deaths attributed to NCDs in India has dramatically increased from 37.9% in 1990 to 61.8% in 2016 (1). This unprecedented health crisis is further compounded by the substantial economic burden of NCDs (2). Several overlapping risk factors have been identified for cardiovascular diseases, including dietary risks, elevated systolic blood pressure, exposure to air pollution, high plasma total cholesterol levels, tobacco use, increased fasting plasma glucose, and a high body mass index (BMI) (3).

Over the past three years, Apollo Hospitals has been publishing annual reports entitled "Health of the Nation" (HoN) (4). HoN reports are based on a diverse range of data sources and research evidence. Some insights are drawn from routine data collected via Apollo's

ecosystem as part of their preventive health checks across 35 centers while others are findings from specific research studies conducted at various Apollo centers, which are at different stages in the publication process.

The objective of the report is to put in place approaches to improve disease prevention, increase the accuracy of diagnoses, and create a more personalized and patient-centric treatment approach. This article summarizes some of the key findings from the reports, delves into India's escalating NCD burden, and underscores the significance of personalized preventive health strategies and policies in tackling this pressing issue.

Key Findings:

1. Prevalence of NCDs is increasing among the population visiting Apollo Hospitals between 2019 and 2022 (4). (Figure 1)
 - a. Obesity increased from 8% to 12%.

- b. Dyslipidemia increased from 32% to 38%.
 - c. Diabetes increased from 24% to 26%.
 - d. Hypertension increased from 9% to 10%.
 - e. The increase is more pronounced in individuals aged >45 years.
2. Geographical variation in NCD prevalence in 2022 (4).

- a. Diabetes ranges from 15% in the west to 27% in Southern India.
- b. Hypertension ranges from 5% in the west to 13% in Southern India.
- c. Liver Diseases range from 28% in the south to 50% in Eastern India.
- d. Dyslipidemia ranges from 37% in the South to 48% in Northern India.

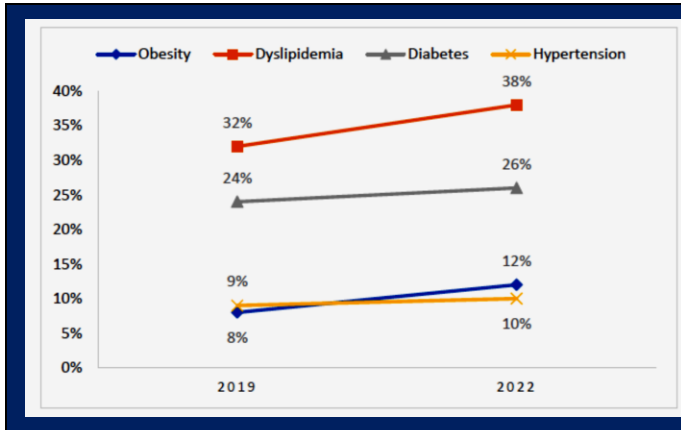


Figure1: Trend of NCDs between 2019 and 2022

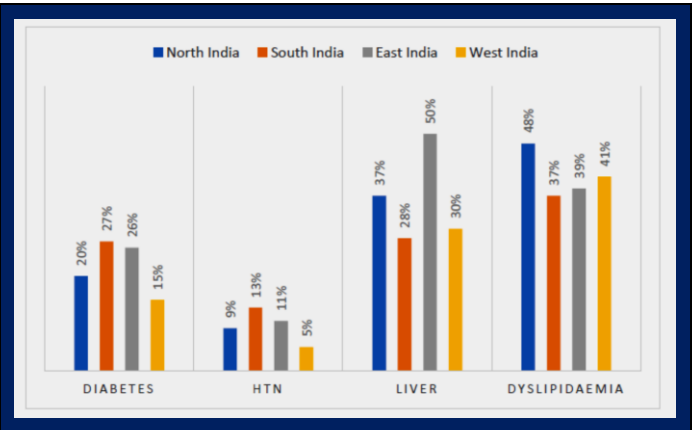


Figure 2: Geographical variation in NCD prevalence

- 3. T2 Diabetes Mellitus and Obstructive Sleep Apnea are correlated, independent of BMI.
 - a. Apollo conducted a study involving 2000 individuals with Type 2 Diabetes. The findings suggest that a significant risk of Obstructive Sleep Apnea (OSA) can occur even in those with a lower BMI of 26 within the tested population. Most of these individuals (91%) had a neck circumference of less than 40cm (5). These findings emphasize the importance of thorough OSA screening, regardless of a person's BMI. This is especially critical for high-risk groups such as those with diabetes.
- 4. Mental health is also a key contributor to the onset of NCDs – both stress and depression are seen to increase the incidence and severity.
 - a. Chronic stress and anxiety were found to increase the likelihood of hypertension by 1.5 times and diabetes by up to 2 times (4). Furthermore, men experiencing chronic stress are twice as likely to develop diabetes compared to women. (Figure 3)
 - b. Our analysis of the PHQ9 Depression scores (6) for 1993 people with Type 2 Diabetes at Apollo Hospitals showed that with every one unit increase in age and BMI, PHQ9 the depression score also increases. About 50% had some form of depression (4).

c.

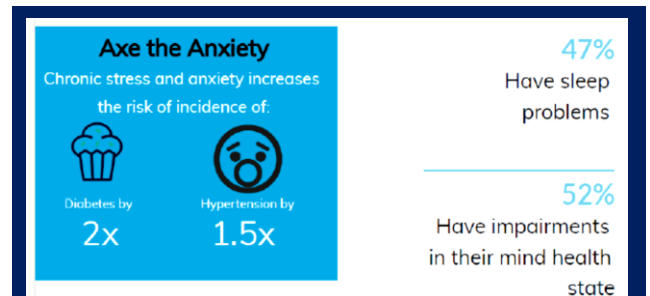


Figure 3: Mental Health- A major unrecognized contributor to NCDs

- 5. Regular and comprehensive health checks, based on an individual's risk factors (both genetics and lifestyle) are critical for early detection.
 - a. The median age of breast cancer diagnosis from mammograms done at Apollo in the last year was 54-57 years. In Asian countries, breast cancer is commonly diagnosed during the age range of 40 to 50 years, whereas in Western countries, the typical age of diagnosis falls between 60 and 70 years (7). This suggests an earlier onset of disease in Indian women,

warranting annual screening for women from 40 years onwards (8, 9).

- b. family history and non-communicable diseases.
 - i. 1 in 3 people with a family history of Diabetes have the condition (4).
 - ii. 1 in 6 people with a family history of Hypertension have the condition (4).

These findings highlight the rising prevalence of NCDs, regional variations, the impact of family history, the role of sleep and mind health, and the importance of regular, personalized screening.

A Multi-Pronged Approach to Tackle India's NCD Burden:

Personalized Treatment and Prevention: With early risk factors like obesity, dyslipidemia, and conditions such as diabetes and hypertension on the rise in India (10), there is an urgent need for personalized treatment and prevention strategies. Healthcare providers should focus on tailoring interventions and therapies to individual patients, considering factors such as genetics, lifestyle, and comorbidities.

Geographic Variation and Regional Strategies: There is geographic variation in NCD prevalence across India, influenced by regional diets and lifestyle factors (11, 12). Policymakers and healthcare providers should develop region-specific strategies to address NCDs, with interventions customized to local cultural practices and dietary habits.

Family History and Genetic Counseling: More extensive genetic screening and counseling can help identify individuals at high risk for NCDs and enable healthcare providers to offer personalized prevention and treatment plans, including screening frequency, lifestyle modifications, and pharmacological interventions.

Sleep and Mental Health: Sleep disorders and mental health issues are significant drivers of NCDs, with obstructive sleep apnea (OSA) and depression being risk factors for diabetes and hypertension (13-15). Promoting awareness about the interplay between sleep disorders, mental health, and NCDs is essential to educate the general public. Providing accessible and affordable treatment options is crucial to ensure that individuals with sleep disorders and mental health issues can receive timely and appropriate care.

Integrating Traditional Medicine: Our data reveal a high prevalence of sleep problems, mental health issues, and digestive irregularities, particularly among individuals with diabetes. Integrating traditional and complementary medicine practices like yoga, meditation, and mindfulness has been shown to have positive effects on sleep quality, mental health, and stress reduction. Incorporating these mind-body practices into the management of diabetes can contribute to better sleep, improved mental well-being, and a healthier digestive system (16, 17).

Way Forward: The present article underscores the need for innovative approaches to prevention, early detection, and personalized treatment to address the growing burden of NCDs in India. India can effectively combat the rising tide of NCDs by adopting a multi-pronged approach that includes personalized preventive health strategies and policies. The focus should extend beyond cancer, cardiovascular diseases, and chronic obstructive pulmonary disease to encompass mental health, sleep disorders, and musculoskeletal stability, among other factors. By addressing these interconnected aspects of health, India can make significant strides in improving public health outcomes.

Collaboration between healthcare providers, policymakers, and community organizations is essential to achieve success in managing NCDs (18). By leveraging the strengths of each stakeholder, a coordinated and comprehensive approach to NCD prevention and management can be developed. This collaborative effort should be supported by adequate resource allocation, investment in research and development, and continuous monitoring and evaluation of intervention strategies.

Education and awareness campaigns are also critical components of NCD prevention and management. Efforts should be made to educate the public about modifiable risk factors, such as diet, physical activity, tobacco use, and alcohol consumption. Equipping individuals with the knowledge and tools to make informed decisions about their health can empower them to take charge of their well-being and reduce their risk of developing NCDs (19).

Moreover, healthcare providers should receive ongoing training and education on the latest NCD prevention and management advances. By staying informed about new developments and best practices, physicians can provide their patients with the highest

quality care and contribute to the overall reduction of India's NCD burden (20).

In addition, leveraging technology and digital health platforms can facilitate better access to healthcare services, particularly in remote and underserved areas (21). Telemedicine, remote monitoring, and mobile health applications can help bridge the gap between urban and rural healthcare, allowing for a more equitable distribution of resources and expertise (22).

Finally, addressing social determinants of health, such as poverty, education, and access to clean water and sanitation, is crucial for a long-term reduction in the burden of NCDs (23). By addressing these underlying issues, India can create a healthier environment for its citizens and reduce the risk factors contributing to NCD development (24).

Limitations: The article draws on a report published from routine health checks. The data might have yielded more specific insights if it were collected with a particular study in mind. Also, inferences reflect the patient population that Apollo caters to, which may not accurately capture the full diversity of health conditions and influences at a population level.

Conclusion: In conclusion, India's growing NCD burden requires a multi-faceted and comprehensive approach that incorporates personalized preventive health strategies, early detection, and targeted interventions. By focusing on the interconnected aspects of health, fostering collaboration among stakeholders, and addressing social determinants of health, India can effectively combat the rising tide of NCDs and improve public health outcomes for its citizens. The situation calls for not just immediate but also enduring action, as the effects of our efforts today will resonate through future generations. Our primary objective should be to create an environment where the looming threat of NCDs is significantly lessened. We are committed to fostering a future for India where the overall health, wellness, and quality of life of its citizens are enhanced, creating a legacy of improved public health and stronger national well-being.

Disclosure: The authors declare no conflict of interest in the publication of this article. The information provided in this article is based on factual data and unbiased analysis to advance knowledge and promote public health.

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WMC-23-001: Early Detection of Cardiotoxicity by Longitudinal Strain Imaging in Patients Receiving Anthracycline Chemotherapy: A Prospective Study

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Cardiotoxicity is the most important side effect of anthracycline and other chemicals affecting the myocardium. It is well known that anthracyclines induce left ventricular dysfunction. The early onset anthracycline-induced cardiotoxicity occurs within the 1st year after chemotherapy, in most cases, leads to worsening of cardiac function. For conventional analysis, left ventricular volumes and left ventricular ejection fraction (LVEF) are the most widely used parameters to detect cardio toxicity, which seem to underestimate cardiac damage. The aim of our study was to find out whether early cardiac changes in patients receiving anthracycline chemotherapy can be detected by the strain imaging parameters of the 2D echocardiography prior to the reduction in ejection fraction. It is a diagnostic study on 52 patients attending a tertiary care hospital in India diagnosed with Ca breast or lymphoma and are receiving anthracycline chemotherapy over a period of 2 years. 2D Strain using ultrasound speckle tracking was utilized to characterize longitudinal systolic strain imaging at baseline, three and six months. and was statistically analyzed. Categorical variables were reported in means with standard deviation. Global longitudinal strain was an early predictor of cardiotoxicity than left ventricular ejection fraction in 2D in Echocardiography. Also, the base to apex ratio and apical sparing is a useful marker for assessing the regional strain abnormalities. A reduction of Base to Apex ratio by >9% in longitudinal strain at three months is a warning sign to the cardiologist and oncologist. Monitoring patients with echocardiography which utilize strain imaging, both at baseline and at three- and six-months following commencement of their treatment may also help treating physicians to identify those patients with sub clinical cardiac dysfunction.

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WMC-23-002: Accurate and Timely Diagnosis of Characteristic Rash Can Improve Outcomes in Mpox (Monkeypox)

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Contrary to popular belief, Monkeypox (now referred to as mpox as per WHO guidelines), a rare zoonotic disease, is not a novel virus but can be dated back to 1970. Since 2003, 16 countries worldwide have reported human mpox cases and a total of 7,510 mpox cases have been recorded within the United States. This case report outlines an atypical presentation of mpox and underscores the importance of appropriate diagnostic workup, management, and treatment. A 40-year-old Hispanic male with a past medical history of HIV (2015), Type 2 diabetes, and latent syphilis presents to clinic with bright red blood per rectum and lower abdominal pain. He is afebrile and has an occasional sore throat but does not endorse any chills, cough, or dysuria. His vital signs are stable. He has a tender pustular rash with a central clearing on his tongue, chin, abdomen, and perianal region. He has no other pertinent symptoms. He is sexually active with male partners. He denies smoking and drug use but consumes alcohol on weekends. His current medications comprise Triumeq and Sitagliptin-Metformin. In the past month, he

traveled to Texas and Canada. Lab tests reveal a positive stool PCR test for enteroaggregative bacteria, reactive RPR 1:32, <20 copies of HIV PCR, and negative gonorrhea/chlamydia test. CT abdomen and pelvis (Fig. 1) is significant for hepatosplenomegaly, left lower lobe lung nodule, perirectal fat stranding, and rectal lymph node enlargement. His colonoscopy (Fig. 2) reveals multiple erosions, edema, and a loss of vascular pattern in the rectosigmoid colon while the biopsy reveals necrosis of the epidermis, inflammatory infiltrate comprising neutrophils and lymphocytes, large multinucleated cells, and eosinophilic viral inclusion bodies. These findings strongly indicate the diagnosis of mpox proctitis.

On May 20, 2022, the CDC issued a health advisory strongly advising timely diagnosis of mpox virus. Clinicians should obtain a detailed sexual and travel history as well as carefully examine characteristic rashes. Although mpox can be easily confused with sexually transmitted infection (STI) and varicella zoster, these infections can occur concomitantly and hence a diagnosis of an STI does not exclude the possibility of co-infection with mpox. The incubation period of mpox virus ranges from 5-15 days and can be transmitted via bodily fluids, fomites, skin-to-skin contact with an infected person, and respiratory droplets (rare). Patients initially experience flu-like symptoms (headaches, back pain, fever, sweats, chills, cough, lymphadenopathy, sore throat, pharyngitis, myalgias, mouth sores) followed by a rash (macules and papules in a centrifugal distribution with subsequent vesicles, pustules, and crusting) 1-4 days later. Symptoms typically present within 3 weeks of exposure to the virus and patients are infectious from the onset of symptoms until scab formation. The illness can last from 2 to 4 weeks. The diagnostic workup should include biopsy and histopathology, immunohistochemical staining with antibodies against orthopoxvirus, viral culture, electron microscopy, and PCR testing (available through the CDC). Management should entail appropriate isolation protocols, use of personal protective equipment, proper hand hygiene and handling of contaminated waste. Currently, the treatments for mpox are tecovirimat, an antiviral medication that is FDA approved to treat smallpox, and vaccinia immune globulin intravenous (VIGIV). It is vital to correctly and promptly diagnose mpox to avoid complications and mortality.

This case report highlights a unique and atypical presentation of mpox where the patient's clinical symptoms comprised genital and perianal lesions and

proctitis. Any suspicion of mpox should result in obtaining specimens, facilitating laboratory testing, and notifying the health department promptly to ensure proper contact tracing to curb community spread.

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WMC-23-003: Biexponential Correction of DTPA Clearance should be Used in the Assessment of Renal Function for Live Kidney Donors

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Live kidney donors represent half of all kidney donors annually and allow for kidney transplantation which remains gold-standard therapy for those with end stage renal disease. Safety after donation is essential. Evaluating candidates must entail proper assessment of kidney function prior to donation to ensure appropriate long-term function. Many methodologies to assess renal function exist, including estimated glomerular filtration rate (eGFR) equations and radionuclide-based techniques using Tc99m-labeled DTPA-based techniques. Recently, DTPA eGFR calculations have been shown to be more precise with the addition of a biexponential correction rather than using a simple single exponential fit. The purpose of the study is to compare these DTPA methodologies in a modern cohort of live kidney donors and to correlate DTPA and CKD-EPI 2021 equation eGFR calculations. The purpose of the study is to compare these DTPA methodologies in a modern cohort of live kidney donors and to correlate DTPA and CKD-EPI 2021 equation eGFR calculations. This study included all donors at our institution (01-22-2017 to 12-16-2020) with preoperative DTPA-Tc99m measurements. Serum-creatinine eGFR (CKD-EPI 2021 equation) calculations were performed for all patients. DTPA and eGFR-based methods were compared with linear regression analysis. Single

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exponential DTPA calculations with and without early exponential correction were compared with t-tests then compared to established age-based reference levels. This cohort included 178 kidney donors. There was no correlation between eGFR and DTPA ($R^2 = 0.1165$). Average age in the cohort was 43.7 years. The age-based reference value for this age should be 93.6 mL/min. Upon applying the early exponential correction for DTPA, eGFR was closer to the reference value than using a single exponential correction (97.25 vs 117 mL/min $p < 0.0001$). Our results support that DTPA with a biexponential correction is a more accurate way to determine pre-donation kidney function than the single-exponential calculation and more exact than calculated eGFR for live kidney donors. We recommend using early exponential correction for DTPA calculations which may optimize post-donation outcomes.

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WMC-23-004: Recognizing the Needs of Small, Rural Communities using Promotora-led Surveys.

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Knights Landing One Health Clinic in Knights Landing, CA was started when members of the community recognized the lack of access to healthcare and reached out to UC Davis Medical School. Community members, the clinic, and UC Davis administered surveys to understand the conditions of Knights Landing as they had not received medical aid since 2011, despite being represented on county surveys. This project aimed to determine the best way to assess the needs of small, rural communities by comparing these surveys to each other and county data. It also sought to see if community involvement would improve representation. A census was administered in 2012 to all residents of the community and was followed by a health needs assessment survey in 2013. Another survey was administered in 2018. The 2012 census and the 2018 survey were created and/or administered with the help of community leaders or Promotoras. The surveys were coded and compared to each other and the U.S. Census for a longitudinal analysis of the community conditions and needs. The results of the demographics questions were compared to determine if the methodology was accurate and reliable. Once established that the surveys were accurate, the county data was compared to the clinic/UC Davis data. A comparison of the Knights Landing census to the U.S. census revealed that the U.S. census does not represent the community well. Due to the sampling method and lack of trust in the community, the U.S. census overrepresented community members whose professions did not involve labor. It was seen that Promotora-led surveys were more representative of the community in certain aspects such as occupation and education. Even though the Promotora-led surveys were seen to be more representative, they can still be improved. A follow-up survey was created and administered in 2022 using the information learned from the previous surveys and is currently being analyzed. Furthermore, allyship between the community, local government, and UC Davis created a low-cost solution to upstream healthcare barriers. The Knights Landing clinic used the survey information to tailor its services to the community's needs to provide better quality healthcare; this further supports

the importance of performing more personalized needs assessments of small, rural communities.

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WMC-23-005: Left Pelvic Kidney

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A pelvic kidney is a rare and usually asymptomatic developmental anomaly that is often incidentally detected. We present an incidental finding of a pelvic kidney on a single-photon emission computerized tomography nuclear perfusion study. A 74-year-old female with abdominal aortic aneurysm, coronary artery disease, prior coronary artery bypass grafting, prior bladder, and breast cancer status-post surgery underwent single photon emission computerized tomography (SPECT) nuclear perfusion imaging for preoperative risk stratification. The nuclear imaging showed normal rest and stress perfusion imaging with normal wall motion. Interestingly, it also revealed a very prominent uptake in the left pelvis area corresponding to a previously known left pelvic kidney. The embryologic kidney rises from the pelvis into the lumbar region in the 9th week. A pelvic kidney is when the kidney fails to rise in its metanephros stage during embryogenesis. Its incidence is approximately 1 in 1000 births. Though mostly asymptomatic, urinary tract complications can develop. As an ectopic kidney may receive vascular access from a range of vessels as the fetal blood supply can be retained, understanding this anatomy is essential for any surgeon operating on a patient with an ectopic kidney. In contrast, nephroptosis is when there's downward renal descent of ≥ 5 cm while standing in the upright position on intravenous pyelography or nuclear medicine studies, and it's usually symptomatic. It's caused by muscular contraction of the diaphragm during respiration or by assuming an upright posture, allowing gravitational force to lower the kidney from its usual position. A pelvic kidney also needs to be differentiated from a renal transplant. Conclusions: Incidental non-cardiac finding of pelvic kidney seen on SPECT imaging. A

pelvic kidney needs to be differentiated from nephroptosis and renal transplant.

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WMC-23-006: Gene Expression Profile Analysis Reveals TNFAIP3 As A Key Player In Breast Cancer Proliferation and Metastasis

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Breast cancer is the second most common cause of cancer-related deaths among women worldwide. Rapid metastasis impairs other vital organs causing >90% of these deaths. If breast cancer metastasis can be better understood, the progression of the disease can be controlled through targeted treatment. This study uses big data analytics to gain mechanistic insight into metastasis. By investigating the proliferation pathway, we discover hub genes to pinpoint a gene target for therapy. The gene expression profiles of GSE99394, GSE1246464, and GSE103865 were acquired from GEO big data repository. A visual analytics platform, Network Analyst, was utilized to perform KEGG and GO enrichment analysis and group genes into pathways, lists of genes in the same biological process. The proliferation pathway had the highest impact on metastasis. Examination of this pathway within the three datasets yielded 44 shared significant genes, determined by differential expression. These genes were narrowed down further based on two criteria: connectivity in Protein-Protein interactions and high differential expression. From these criteria we were able to discover 11 hub genes and isolate a single promising candidate. This examination revealed 11 differentially expressed genes (DEGs) as gene targets to control breast cancer metastasis: LYN, DLGAP5,

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TNFAIP3, CXCR4, CDC6, NANOG, IFI30, TXP2, AGTR1, and FTH1. Upon studying the function, genomic data, and pathway involvement of the target genes, TNFAIP3 proved to be a promising candidate due to its role in the NF- κ B signaling pathway which significantly contributes to cancer metastasis through inflammation as well as proliferation regulation. Our results reveal a previously unknown link between TNFAIP3 and its role in metastasis through inflammation and circulating tumor cells (CTCs). Our results identify that the upregulation of TNFAIP3 plays a significant role in the progression of metastasis and can potentially be an important gene target in breast cancer treatment.

WMC-23-007: Cardiopulmonary Resuscitation in Patients with Covid-19: A Capital Region Hospital's Experience

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The initial published experience of cardiopulmonary resuscitation (CPR) raised question as to the benefit for patients with Covid-19 who suffered in-hospital cardiac arrests (ICHA) compared to that of pre-pandemic patients and non-Covid patients during the same time period (1). IHCA outcome events have documented lower rates of return of spontaneous circulation (ROSC), lower survival to hospital discharge rates, and worse neurologic outcomes (2). A study from rural Georgia showed 100% mortality rate for Covid-19 patients with IHCA (3). Prior to the Covid-19 pandemic, the survival rate to hospital discharge for adult patients undergoing in-hospital CPR was 25% (4). The purpose of this study is to explore the survival rates for inpatients with Covid-19 who received CPR following IHCA at a community hospital in the Capital Region of New York State. We retrospectively reviewed charts of 26 Covid-positive adult patients who underwent CPR from March 2020 to February 2021. We assessed survival outcomes, length of stay (LOS), the use of mechanical ventilation, hemodialysis, and vasopressors prior to the 1st cardiac arrest. Acute respiratory distress syndrome (ARDS), previous history of end-stage renal disease (ESRD), and prior history of cardiac disease among our patients were also documented. Of the 26 patients with Covid-19 who underwent CPR after a cardiac arrest, 25 did not survive to discharge (96.2%). One patient was transferred to a tertiary care center after ROSC, and data was lost to follow-up. After CPR, 42.3% (11/26) of patients had ROSC. Of these 11

patients, 63.6% (7/11) later had a do not resuscitate (DNR) order placed, 18.2% (2/11) died after a 2nd cardiac arrest, one patient was declared brain dead, and one patient was transferred. Patients received the following therapies prior to cardiac arrest: mechanical ventilation 46.2% (12/26); hemodialysis 38.5% (10/26); and vasopressors 42.3% (11/26). Patients in our study also had the following conditions: ARDS 96.2% (25/26), ESRD 15.4% (4/26); and history of cardiac disease 30.8% (8/26). For the hospital, Covid admissions rose precipitously from November 2020 to January 2021, but there were not as substantial increases in Covid patients on ventilators or in the number of ICU deaths. Covid-19 positive patients had a worse CPR mortality rate (96.2%) than that of pre-pandemic patients (75%) and non-Covid-19 patients. These patients were primarily on at least one form of life-sustaining therapy (69.2%) prior to their cardiac arrest with most patients being diagnosed with ARDS. Fewer patients had pre-existent cardiac or renal disease. Future research can aggregate mortality data related to in-hospital CPR for Covid-19 patients and account for the effects of utilized therapies on outcomes as well as compare the CPR survival rates among different types of hospitals on the national level, considering size, location, and additional variables.

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WMC-23-008: Low-Complexity, Convolutional Neural Network Optimized for Smartphone-Based Detection of Malaria from Thin Blood Smears

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There were 228 million cases and 405,000 deaths resulting from malaria in 2021. Resource-limited communities face higher burdens due to a lack of screening tools for diagnosis. To improve access, we developed a deep learning-based smartphone app with a VGG16 convolutional neural network (CNN) that identifies infected erythrocytes in thin blood smears with an accuracy of 96%. However, the model was too burdensome for some smartphones. Hence, our objective is to develop a more accurate model with less model training parameters. By reducing the complexity of the neural network model, it would allow the smartphone platform to detect malaria with less processing power. Consequently, we trained a new MobileNetV3 CNN that significantly reduces computational burden. This allows the predictive model to be functional on most budget Android phones and thus increasing accessibility. The CNN models were trained on the NIH malaria dataset, which consists of 27,558 images of infected and normal erythrocytes, scaled to a 128x128 resolution. The image dataset was split into 19,292 (70%) training images and 8,266 (30%) testing images. 5-fold cross-validation was performed to control overfitting and the final MobileNetV3 CNN and VGG16 CNN were fitted on the 19,292-image training set and assessed with the 8,266-image test set. The MobileNetV3 CNN achieved 98.11% accuracy, 96.69% sensitivity, 99.37% specificity, and an AUC of 0.9982. In contrast, the previously developed VGG16 CNN only achieved 96.53% accuracy, 95.00% sensitivity, 98.07% specificity, and an AUC of 0.9940. The MobileNetV3 CNN has 11.4 training parameters, compared to the VGG16 CNN with 24.1 million training parameters. Lastly, the MobileNetV3 CNN file size is 88 MB, compared to the original VGG16 file size of 272 MB. The MobileNetV3 CNN outperforms the previously reported VGG16 CNN, despite have a 2-fold reduction in

training parameters and 3-fold reduction in file size. As a result, the smartphone app and prediction model can be run on older Android phones with less hardware capacity, significantly expanding the accessibility of this deep learning technology.

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WMC-23-009: Telangiectatic Osteosarcoma

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Telangiectatic osteosarcomas are a rare osteosarcoma variant that account for 4% of osteosarcomas. They often appear in adolescents and young adults with twice the amount appearing in males than in females. The most common sites of telangiectatic osteosarcomas are in the distal femur, proximal tibia, proximal humerus, and proximal femur. No exact etiology or definitive risk factors are currently noted. TOs show destruction of medullary and cortical bone, with new periosteal bone only seen near tumor edge and within septum. There may be atypical stromal cells in the septum. Dilated blood or tumor-filled cavities are also characteristic of TO. Patients present with pain and a soft tissue mass. Histologically, these consist of blood-filled or empty cysts with septa presenting with nuclear hyperchromasia and osteoclast-like cells. 36-year-old male with no past medical history presents with sudden onset left knee pain with the inability to ambulate. He states that the pain is 10 out of 10 in intensity. He also mentions that he has had vague pain in the left knee for about 1 year. He states that he has lost approximately 10 to 15 pounds unintentionally over the last 2-3 months. Giant Cell Tumors (GCT) present as expansile lytic lesions which extend from the metaphysis into the epiphysis. They often about the articular surface and have a non-sclerotic margin. On MRI they may have areas of hemorrhage and fluid-fluid levels. However, the aggressive features including the cortical destruction and soft tissue component with osteoid matrix make GCT less likely. Chondrosarcomas are lytic bone lesions that can have aggressive features including cortical destruction and soft tissue components. However, they classically have a chondroid matrix with ring and arc calcifications rather

than a predominantly lytic appearance with an osteoid matrix. Additionally, they are typically very hyperintense on T2 sequences given the chondroid matrix and do not typically contain fluid-fluid levels. Aneurysmal bone cysts (ABC) can have a similar appearance presenting as expansile lytic lesions with potential cortical thinning and pathologic fracture. They classically can display fluid-fluid levels on MRI. However, the cortical destruction with soft tissue component and corresponding osteoid matrix on plain film suggests a more aggressive diagnosis.

This case demonstrates a lytic bone lesion centered at the distal femoral metaphysis with epiphyseal extension. Although the zone of transition appears narrow on plain film, there is a pathologic fracture and suggested areas of a soft tissue component with an osteoid matrix. On MRI, we see fluid-fluid levels which can represent multiple etiologies however, there is clear cortical destruction and a soft tissue component. This suggests a more ominous diagnosis with telangiectatic osteosarcoma as the primary differential when aggressive features are seen in conjunction with fluid-fluid levels.

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WMC-23-010: Evaluating Social Determinants: Disparities in Access to Resources Amongst Clients of the Center for Law and Justice

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The Center for Law and Justice (CFLJ) was created to serve formerly incarcerated individuals. It is also a part of the Health Equity Project service-learning program at Albany Medical College. The last community needs assessment was conducted in 2016. This is a more comprehensive assessment to better understand the current needs of the community especially in light of the COVID-19 pandemic. 107 past or current clients of the CFLJ were contacted a maximum of three times. Surveys were administered over the phone or in-person. Data collected included demographics, interactions with the criminal justice system, employment, housing, food, healthcare, and domestic violence. A quantitative and qualitative analysis of the data was conducted. 17 surveys were completed. 15 respondents identified as Black/African American, and 2 respondents identified as White/Caucasian. Regarding the criminal justice system, 10/17 reported having gone to jail or prison. A thematic analysis of responses regarding incarceration yielded themes including loss of friends and family, limited freedom and difficulties starting over. Three respondents indicated pursuing or receiving a GED while incarcerated. Regarding health 10/15 had a chronic health issue requiring regular treatment and/or medical care, and 10/15 had a disability limiting their ability to work or take care of themselves. 8/15 individuals expressed barriers to accessing healthcare which ranged from finding providers who accepted Medicaid, providers not believing their symptoms, outright or more subtle racism, and communication issues. This community is in need of the resources of the CFLJ and their partnership with the Health Equity Project. The findings of this survey will allow both student volunteers and the CFLJ to better understand the needs of the clients and address them with a more targeted approach. The data can also be used to advocate for the needs of the formerly incarcerated, a community which faces a number of unique hardships.

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WMC-23-011: Can't Feel My Legs

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Transverse myelitis is a rare disorder with an estimated annual incidence of 4.6 cases per million (1). It is a rapidly

progressive disorder characterized by acute or subacute spinal cord inflammation involving the myelin sheath. The etiology of the pathology is associated with multiple etiologies that include infectious, autoimmune, vascular, and idiopathic disorders. The most relevant clinical manifestations involve sensory changes at 39%, weakness at 25%, and back pain at 22% (2).

We present two cases with acute extremity weakness that developed this symptom after Johnson & Johnson's COVID-19 Vaccine. The main differentiating factor between our two cases is the variability in the time between receiving the vaccination and symptom onset. included progressive bilateral lower limb weakness, decreased sensations, and diminished reflexes associated with back pain. In both cases, the workup for infectious, autoimmune, and vascular etiologies was unremarkable. MRI findings were consistent with a diagnosis of extensive transverse myelitis.

The association between COVID-19 vaccination and central nervous system manifestations has been reported. Vaccine-associated transverse myelitis (VATM) is a rare condition. Nonetheless, it is essential to take a vaccination history in patients with new onset of neurological manifestations. A prompt diagnosis and treatment of VATM are necessary to prevent long-term neurological damage or closely monitor for potential recurrences.

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WMC-23-012: Effects of Scribe Implementation on Billing Practices at Orthopaedic Clinics in a Large Academic Medical Center

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Medical scribes are important members of the healthcare team who serve as documentation specialists and allow healthcare providers to focus on their clinical duties. These professionals can play a role in optimizing clinic workflow and improve provider wellness. However, hiring scribes does impose a new cost to the healthcare system. This cost may be recouped by improved data capture and improved billing practices, but currently little is known about what effects scribes may have on these domains. We conducted a retrospective study of orthopedic providers affiliated with a Level 1 trauma center between 2019 and 2020. Billing data was collected from 14 providers across 5 different subspecialties (5 sports medicine specialists, 2 hand and upper extremity specialists, 3 spine specialists, 3 foot and ankle specialists, and 1 pediatrics specialist) in the six-month period preceding and directly after the implementation of scribes into their clinics (i.e., three months prior to scribe implementation and three months after scribe implementation).

To be included in the study, providers needed a full 6 months of billing data before and after the implementation of scribes in their clinic. Billing data included the number of patients seen, the number of clinic visits, and charges and collections for the CPT codes related to the clinic visit itself as well as any ancillary costs. CPT codes for a visit included new, return, and consult appointments for Level 1 through 5 encounters, as well as post-op patients. Encounter levels were determined by the last digit of the CPT code billed, which corresponded with increased encounter complexity or length (for example, CPT codes 99202, 99212, and 99242 were considered Level 2 encounters and were less complex or shorter than Level 3 encounters). All other charges were grouped under ancillary charges. Providers were excluded from the study if they did not have at least 6 months of pre- and post-scribe data available. The implementation of medical scribes in these orthopedic clinics increased visit coding levels as well as the rates of ancillary coding. Further, balancing fewer responsibilities and promoting a greater focus on patient care can improve provider wellness, although this was not directly addressed in this study. However, incorporating scribes into the medical system does incur a new cost to the provider and to the healthcare system at large. Nevertheless, scribe implementation may

recuperate some of the costs by facilitating more accurate data capture, leading to more accurate and comprehensive billing of CPT codes. Furthermore, the efficiency provided by medical scribes may allow for more patient visits to occur during a clinic day. Further research is necessary to investigate these other potential impacts of scribes on the healthcare system.

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WMC-23-013: Nanoscale Structural Analysis of Venous Thrombus Formation and Platelet Aggregation

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Venous puncture wounds have been traditionally studied within the “Core and Shell” paradigm, in which an inner core of closely packed platelets is surrounded by an outer shell of loosely packed platelets. [1][2] Subsequent platelet deposit occurs with less platelet activation with each layer. However, there has not been significant research in thrombus formation at a nanoscale resolution, where would allow for direct visualization of thrombus formation and the arrangement of individual platelets. Hence, our objective is study how platelet aggregation leads to thrombus formation through serial block face scanning electron microscopy (SBF-SEM). This mode of imaging allows us to map out 3D thrombus ultrastructure at nanometer resolution. This advanced technology allows for direct observation of how platelets arrange microstructures at different time points during the clotting process, and to acquire more evidence that can support or modify the “Core and Shell” paradigm. Puncture wounds in mouse jugular vein samples were preserved in epon blocks at 1 minute, 5 minutes, and 20 minutes post-puncture. 2-photo microscopy was used on these samples, before being sequentially sliced by an ultramicrotome knife in the SBF-SEM, allowing for a voxel resolution of 20x20x100 nm. The 3D image stacks were then segmented into different labels (vessel wall, red blood cells, tightly adhere platelets, loosely adherent platelets, degranulated platelets). Using the segmented images, each sample was volume rendered into 3D models that allowed for visualization of the thrombus. Structural analysis of the platelets showed that rather than forming a platelet core that acquires progressive external platelet shells, thrombus growth is initiative by localized platelet aggregation with pedestal-

like formations, as shown in the 1-minute post-puncture samples. Then, these platelet pedestal-like formations form an enclosed cavity on the extravascular side to create a cap-like structure in the 5-minute post-puncture samples. Finally, in the 20-minute post-puncture samples display an accumulation of platelets onto the cavitated thrombus. Our findings support the parts of the “Core and Shell” paradigm for thrombus formation, in which we see the formation of a cap-like thrombus structure that is reinforced with external layers. However, rather than having a solid core of densely packed platelets, we see that the thrombus initially has a cavity with no platelets inside. Rather than forming a tight core of platelets, it appears that columns of platelets extend outwards to form a large, enucleated structure.

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WMC-23-14: Do we Care Less Now: Declining Empathy in Medicine

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Empathy is an essential component of the doctor-patient relationship. Clinical empathy can be divided into three phases: Phase 1- empathetic listening, Phase 2- responding to the emotion and expressing an empathetic understanding of that experience, and Phase 3- patient's understanding of the clinician's response (1). Empathy can be developed among trainee doctors; it is not just something that individuals are born with; increases have been seen through experiential learning (1). The importance of empathy at the center of the doctor-patient relationship is well-known, but there are additional, less obvious benefits that include patient satisfaction, patient empowerment, and adherence to treatment plans (1). More recently, it appears that empathy has been declining due to increasing burnout and not being adequately cultivated in medical school (2). The objective of this review is to better understand the reasons for declining empathy among physicians as well as medical students. This knowledge will serve as the foundation to design an

empathy training pilot program for medical students that will enable them to develop and maintain patient-centered empathy during medical school. Our initial data review focused on understanding the different aspects of empathy and how it changes during medical school and during one's medical career. We then reviewed previous and current empathy training programs, understanding their successes and pitfalls, and plan to use this data to help design our pilot program. Empathy has diminished in clinical practice as evidenced by a meta-analysis analyzing 11 studies on medical students' empathy progression in which nine studies showed significant declines in empathy, one with a declining trend that did not achieve significance, and one with stable empathy scores (2). Other studies have shown that depression, reduced quality of life, and low sense of well-being have adversely affected medical students and residents (2). 46% of practicing physicians have showed signs of burnout, being link to depersonalization with signs and symptoms differing among male and female physicians (3). Loss of empathy is transforming into physical and emotional exhaustion, resulting in distress and burnout (4). Organizational empathy, an organization understanding how to make the lives of its staff better, is crucial in enhancing clinical empathy (5). Despite the importance of clinical empathy, there is a gap in communication skills and empathy training, with no clear method on how to best teach and develop these skills (1). We propose designing an empathy training pilot program for medical students. Its main feature will be role modeling with assigned physicians as empathy-training mentors along with wrap-up discussions about the emotions of the clinical encounter and the patient-physician relationship. The program will not be arduous and will be easily incorporated into current course work. Medical students will be empowered and encouraged to develop skills and qualities that foster empathetic interactions toward patients and peers and grow into the kind of physicians they envisioned at the outset of their training.

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WMC-23-015: The Patient Narrative and the Impositions of Implicit Biases in Health Care

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"If you make listening and observation your occupation, you will gain much more than you can by talk" (Robert 2021). This quote holds true in many parts of life but especially in the field of medicine as pertaining to the patient narrative. Being a physician is a tough job and it can feel like there is not enough of the valuable resource known as time in the day to successfully complete all of one's duties as a physician. Although a physician may ask a patient to share their story, on average, the physician tends to interrupt the patient after only eleven seconds of listening with a close-ended question in response to the patient's narrative (Ospina et al. 2019). This doctor-patient encounter is very comparable to the concept of pitching a product idea on the television show *Shark Tank*, but, in this case, the contestants on the show are actually given more time to speak sans-interruption than a patient in a doctor's office is allowed.

The patient narrative includes the patient's sentiments about their health condition and how this has affected their lifestyle as opposed to a list of ailments. A large portion of the patient's diagnosis and treatment plan is rooted in the patient's narrative. If the health care provider does not listen to the patient's story, they may miss a vital puzzle piece that could aid them in solving the mystery. The extent to which the health care provider listens to and

values the patient narrative could be clouded by implicit biases that the provider holds. Implicit biases are preferential attitudes and associations towards people, which exist subconsciously. The purpose of this study is to explore and understand the extent to which health care providers listen to the patient's narrative and the effect that implicit biases, especially gender bias, may play in patient interactions. There exists literature regarding the importance of listening to the patient narrative and statistics about how often patients are interrupted during a visit, but there is a lack of studies where health care providers are given a chance to tell their own narrative regarding their approaches to treating patients. Furthermore, there is information concerning gender bias in medicine, especially with regards to its presence in medical training, but there are not enough studies where health care providers are interviewed regarding their thoughts on implicit bias in medicine. It is often assumed that there must be a significant number of health care providers who are projecting their biases on patients, given the amount of media coverage this topic has received in recent years, but the people who are affected by this issue, patients, physicians, and nurses, have not been questioned regarding how prevalent implicit biases are in health care. Interviewing physicians, nurses, and patients provided some perspective on how much the patient narrative is emphasized and the role that implicit biases play in health care experiences. Five physicians, two medical students, three nurses, and five patients were interviewed for this study. The interviews were semi-structured, and all interviews commenced with a general demographic question asking about the participant's age, race, sex, and specialty if applicable. The questions to health care providers were divided into three overarching categories. The initial questions focused on general factors involved in patient interaction such as the method of documentation of the patients' medical history and the length of time spent with patients. The middle section of the interview included questions that were concentrated on the patient narrative such as the effect of methods of patient information documentation on the ability to listen to the patient and ways that the patient narrative was emphasized in their training. Then, the questions regarding the patient narrative segued into a discussion about implicit biases and the health providers' perceptions of the presentation of biases in health care. General questions regarding the average length of patient visits were asked to ease into the discussion of the patient narrative so that the provider was more comfortable and willing to share

their thoughts on the importance of the patient narrative. Questions regarding implicit biases were asked in order to comprehend the relationship between implicit biases and patient interactions, especially the patient narrative.

The interviews with patients were largely focused on questions regarding the patients' perceptions of their physicians. These thoughts were gauged by asking the patients questions regarding how much time and attention their physicians give to them during appointments and whether the patients feel that their concerns have been addressed. In order to gain clarity on how satisfied patients are with encounters with their providers, patients were asked to rate their levels of satisfaction on a Likert scale and expand as to why they chose the rating that they did. Lastly, the patients were asked questions regarding their interactions with doctors of different sexes and the way that implicit biases from health providers have or have not affected the patients' overall health care experiences. All of these questions together aimed to understand what the doctor-patient relationship looks like from the patient's perspective in terms of attentiveness from the doctor, bonds formed between the patient and physician, overarching satisfaction levels, and the role that implicit biases may play in the physician-patient relationship.

The data collected from the interviews were analyzed using thematic coding on Excel after transcribing all of the interviews. Inductive, interpretive, and descriptive thematic analyses were primarily used. Inductive thematic analysis focused on examining the data itself rather than heavily incorporating theories in the analysis. Descriptive thematic analysis mainly serves to summarize the major findings of the data. Lastly, interpretive thematic analysis serves to decipher the deeper meanings in the data. This was done after inductively and descriptively analyzing the data (Clarke et al. 2015). Key questions from the interviews were placed in columns in the spreadsheet and each participant was assigned to a row where their responses were copied and pasted. Their collective responses were compared and analyzed to find common themes, and vital quotes from the interviews were highlighted. The interviews revealed many biases present in health care, including gender, race, and age biases along with a bias of health care providers favoring patients that they share common interests with. A multitude of themes were identified among the interviews, some of which include a lack of curriculum regarding the patient narrative in medical training, methods of documenting patient information, age bias, and the hesitancy of providers to discuss their personal biases. It

was established that, overall, the interviewed health care providers do not feel that listening to the patient narrative was emphasized in their medical training. Furthermore, all of the patients shared anecdotes of age bias, and they all felt that female physicians are more empathetic than male physicians. The findings of this study revealed that many biases are present in health care including but not limited to biases related to age, gender, race, and common interests. Furthermore, the interviews with health care providers showed that there is a lack of patient narrative training in medical and nursing school, so this is something that could be focused on in the future. Additionally, the interviews also revealed that health care providers are not always aware of or willing to discuss their personal implicit biases, so this is another aspect of training that could be enhanced in medical training. This study contributes information about the extent to which the patient narrative is emphasized in medical training and practice and the ways that various implicit biases could affect the doctor-patient and nurse-patient relationships. This study will be expanded to contain a larger sample size in the future and will also explore the role that the patient's ability to choose a provider plays in biases and having the patient narrative be heard.

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* A A P I Convention
July 6 - 9 , 2023
Philadelphia, P A

OR – Oral Presentation; PO – Poster Presentation

Oral Presentations:

AAPI-23-OR-001: Overcoming Challenges to Practicing Orthopedic Surgery in India

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As a third-year medical student at Vanderbilt University School of Medicine, I participated in an orthopedic surgery global health rotation at Sravani Hospital, a multispecialty hospital in Guntur, India. There, I worked with Dr. Sitaramanjaneyulu who is the only orthopedic surgeon at the hospital and practices all subspecialties. I will be describing challenges to practicing orthopedic surgery in India and several strategies I have seen to overcome them. The biggest challenge is limited access to care and lack of resources in the outpatient, consult, and operative environments. Other challenges include a high workload with an increased risk of burnout, language barriers, and providing equitable care while using a predominantly out-of-pocket payment model. The intent is to raise awareness of how challenges while working in a surgical specialty can be overcome with creative, cost-effective solutions. I will also utilize this opportunity to compare and contrast my experience in the field of orthopedic surgery at Vanderbilt University Medical Center with my experience at Sravani Hospital.

AAPI-23-OR-002: Increased Expression of Group II mGluRs in the Medial Geniculate Nucleus and Auditory Cortex of Aged Compared to Young Adult Mice

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Background: Metabotropic glutamate receptors (mGluRs) are thoroughly investigated because ligands targeting them have a potential for clinical development in several psychiatric and neurological disorders. These receptors are expressed throughout the auditory system but knowledge regarding their roles is very limited. mGluRs are classified

into three groups: group I includes receptor subtypes 1 and 5, group II includes subtypes 2 and 3, and group III includes subtypes 4, 6, 7, and 8. Previous study of group II mGluR receptors found that its expression in the inferior colliculus (IC, an auditory nucleus) changed over the mouse lifespan. Higher expression in the IC of older mice indicated that mGluR modulation of neuronal activity played a larger role in older animals. The objective of this study was to expand on this by examining mGluR expression in two additional auditory areas: the medial geniculate body (MG) and auditory cortex (AC). We compared mGluR 2/3 expression in young and aged mice across three MG regions: ventral (MGV), dorsal (MGD), medial (MGM) and three AC regions: primary (AU1), dorsal (AUD), ventral (AUV).

Methods: Brains from six adults (84–85 days old) and six aged (20–21 months old) CBA/CaJ mice were used. Anti-mGluR2/3 antibody (Millipore AB1553) was labeled with a biotinylated anti-rabbit antibody and visualized via Ni-DAB reaction. Optical density analysis was performed by collecting single focal plane images from the MG and AC using constant illumination and exposure settings. For each photo, overall optical density measures were taken for the entire frame, and neuropil-only or cell body-only optical density measures were collected by specifying an ROI within the image.

Results: We found increased DAB staining in aged animals in every region tested, suggesting that mGluR2/3 expression increases with age. This between-group difference was present when analyses were restricted to the neuropil, but not cell bodies, indicating a potential change in mGluR2/3 trafficking in neurons with age. Furthermore, in both young adult and aged mice, group II mGluR staining was not uniform across brain regions. Regions of the AC did not differ in staining, but there were differences between subdivisions of the MG, with darker staining present in the MGV as compared to the MGD and MGM.

Conclusions: Our results suggest that group II mGluR expression changes within the MG and AC over the lifespan of CBA/CaJ mice. Higher expression levels in older animals indicate that mGluR2/3 modulation of MG and AC neuronal activity plays a larger role in aged animals. Furthermore, mGluR2/3 modulation is likely stronger in the MGV than other parts of the MG irrespective of the age.

AAPI-23-OR-003: Two Cases of Intracranial Tumor with Positive Paraneoplastic Neurological Syndrome Antibody

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Paraneoplastic neurological syndromes (PNS) are a heterogeneous group of immune-mediated neurological syndromes related to malignant neoplasm, but intracranial neoplasms are rarely described. PNS antibody screening is important for the diagnosis of PNS. We describe two unique patients with positive PNS antibodies. The first patient with weakly positive anti-amphiphysin antibody presented with seizure. One focal mass lesion was found in his right prefrontal lobe. He underwent surgery for lesion excision and the lesion was diagnosed as low-grade astrocytoma. The second patient with positive anti-CV2 antibody presented with numbness and weakness in his right upper limb. Cranial MRI scans revealed multiple nodular abnormal lesions with enhancement in his left frontal, temporal and parietal lobes, which progressed rapidly in less than two months and diagnosed as primary gliomatosis cerebri.

This case illustrates that PNS is due to the remote effect of non-neurological neoplasm, but intracranial tumors might also coexist with positive PNS antibodies.

AAPI-23-OR-004: The Effects of Pre-existing Depression on Postoperative Complications Following Thyroidectomy

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Introduction: Thyroidectomy is a common and widely applicable procedure that removes the thyroid to treat pathologies ranging from congenital defects to malignant disease. Depression has been documented to cause adverse outcomes in certain surgical procedures; however, there is a noticeable absence of similar literature regarding thyroidectomies. Our study aims to address this gap by investigating retrospective patient data for differences in postoperative wound infection, respiratory complications, hemorrhage, sepsis, and delirium following thyroidectomy in patients with and without depression.

Methods: Patient records were accessed through TriNetX, a national database of deidentified patient records. Two cohorts were established among patients with a history of thyroidectomy - those with depression and those without depression. Cohorts were matched using a propensity score model including age, sex, race, and common comorbidities associated with depression.

Results: Patients with depression were at a significantly higher risk for developing postoperative outcomes of wound infection ($p=0.0188$), respiratory complications ($p=0.008$), hemorrhage ($p=0.047$), sepsis ($p=0.0436$), and delirium ($p=0.0003$) within 8 weeks of the thyroidectomy. Statistical significance was determined by risk ratio analysis at 95% confidence intervals.

Discussion: Patients diagnosed with depression had significantly less favorable postoperative outcomes following thyroidectomy. These results indicate a need for preoperative, proactive risk assessment and more comprehensive post-surgical care to minimize complications for patients with depression. Future research can assess the risk for poor surgical outcomes associated with other mental health disorders and endocrinological procedures.

AAPI-23-OR-005: Feasibility of Automated Machine Learning Using Public Data for Use in Endoscopy

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Introduction: With recent successful applications of computer vision in gastroenterology and endoscopy, there has been strong interest among physicians to develop practical skills in artificial intelligence. Automated Machine Learning (AutoML) platforms may increase access to complex deep learning algorithms that may otherwise be inaccessible and allow physicians to build complex models for a variety of use-cases simply by providing labeled data. We focused on three commonly used AutoML platforms created by Microsoft, Amazon, and Google that market their ability to create image classification and object detection models. Using labeled data from the publicly

available SUN1 colonoscopy data set, we developed computer aided diagnosis (CADx) and computer aided detection (CAdE) models on all three AutoML platforms.

Methods: The dataset used to evaluate model performance is the SUN (Showa University and Nagoya University) Colonoscopy Video Database. To create the models, the data were uploaded to the respective platforms and the annotation files were parsed into a format readable by the platform. The dataset was split 70/10/20 for training, validation, and testing. We used metrics including sensitivity, specificity, PPV, NPV, F1, AuROC, accuracy, precision, and recall evaluating the CADx models. CAdE models were evaluated using precision, recall, and F1 score. We used analysis of variance (ANOVA) testing with an alpha of 0.05 to determine if the performance of each CADx model was different across platforms.

Results: The sensitivity of the three CADx models was 0.9996, 0.9801, and 0.9770 for Microsoft, Google, and Amazon respectively. The specificity was 0.9993, 0.9665, and 0.9633. There was a statistically significant difference in the performance of the three CADx models. The F1 scores of the models built using Microsoft, Google, and Amazon platforms were 0.9996, 0.9800, and 0.9768 respectively ($P=0.0044$). The F1 scores for the CAdE models made by the Microsoft, Google, and Amazon platforms (using an IoU threshold of 0.5), were 0.9929, 0.9650, and 0.8980 respectively.

Conclusions: Using minimal coding, we were able to create three algorithms, which were all able to achieve high F1 accuracy scores (> 0.9) on CAdE and CADx use-cases. There was a statistically significant difference in the F1 accuracy of the models created by the AutoML platforms. Further analysis on larger datasets and on different landmarks is needed to demonstrate if the Microsoft AutoML consistently performs best on all endoscopic computer vision tasks. AutoML platforms represent a practical entry point for endoscopists interested in exploring computer vision for GI endoscopy and may be an important catalyst for physician driven innovation.

AAPI-23-OR-006: Case Control Study-Association Between Red Cell Distribution Width and Ischemic Cerebrovascular Stroke

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Introduction: Generally, elevated RDW has been seen in relation with several hematologic disorders i.e., anemias. Surprisingly, recent studies have shown that elevated RDW is associated with occurrence as well as severity of Ischemic cerebrovascular stroke.^{1,2} This study was conducted to evaluate the association between elevated RDW and increased risk and severity of acute ischemic stroke.

Methodology: This is a case control study with 100 adults where the parameter of RDW was compared between cases (diagnosed case of ischemic stroke) and controls (without ischemic stroke) to study the association between increased RDW and occurrence as well as severity of stroke using National Institute of Health Stroke Scale (NIHSS) grading.

Results: Age and gender matched 50 cases and 50 controls were evaluated. Amongst the 50 cases with ischemic stroke, 30 patients had elevated RDW level and amongst the 50 control patients only 7 patients had elevated RDW level. The ODDS ratio was calculated to be, 9.2 suggesting that patients with elevated RDW level are more likely to develop ischemic stroke. A significant difference of mean RDW level was observed among all NIHSS categories. Mean RDW level was lowest in the minor category and highest in the severe category suggesting that patients with higher RDW tend to develop strokes with increased severity.

Conclusion: Patients with higher RDW are at increased risk of developing ischemic cerebrovascular stroke and the severity tends to increase with a rise in RDW. The basic test of RDW should be considered as an important parameter for evaluation of patients with risk of stroke.

AAPI-23-OR-007: Basal Ganglia Stroke in Children Following a History of Fall: A Study of Five Cases with Mineralizing Angiopathy

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Aim: The aim of this study is to describe a series of 5 cases of basal ganglia stroke in children following a history of trauma, presenting with mineralizing angiopathy on radiological investigations.

Settings and Design: This is a retrospective study conducted at a pediatric clinic attached to a tertiary care center in South India. The study group was formed by consecutive children with mineralization in the distribution of the lenticulostriate arteries and basal ganglia infarcts who presented at the pediatric unit from September 2020 to June 2021. Data was collected from patient records, physical examinations, and radiological investigations.

Methods and Material: Participants were identified retrospectively, and their age, sex, demography, history of onset, history of trauma/fall, weakness, neurological symptoms and signs, family history, history of developmental milestones, history of similar episodes in the past, treatment response, neurodevelopmental outcome, and recurrence of stroke were documented. Physical examination, systemic examination, organomegaly, and anthropometry were also documented. Magnetic resonance imaging (MRI) and plain computed tomography (CT) of the brain were carried out in all infants except one where ultrasonography (USG) was performed. Complete blood count, echocardiography, were performed in all cases.

Results: The study group consisted of 5 infants with basal ganglia ischemic stroke and mineralization of the lenticulostriate arteries detected using CT. All 5 cases had a history of fall or trauma. The age at initial presentation was before 24 months, and majority of the cases were male. All cases presented with hemiparesis, and 3 of the cases had acute dystonia. Mineralization of the lenticulostriate arteries was detected on radiological investigations. The follow-up period was brief, and partial to complete recovery was observed in all cases.

Conclusion: Basal ganglia stroke can occur in infants following trauma, presenting as a distinct clinico-radiological entity. Mineralization of the lenticulostriate arteries can be detected on radiological investigations, and treatment with aspirin and cilostazol can lead to partial to complete recovery. Further studies are needed to understand the pathophysiology of basal ganglia stroke in children following trauma.

AAPI-23-OR-008: Left Atrial Enlargement as A Predictor for Ischemic Stroke in Hypertensive Patients: Case Control Study

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Background and objectives: Cerebrovascular accidents are the leading cause of death globally, and it is acknowledged that identifying and treating the risk factors for stroke has the greatest influence on morbidity and mortality. One of the prominent predictors for ischemic stroke is the size of the left atrium (LA). Left atrial enlargement is linked to blood stagnation in the left atrium, which can lead to thrombus formation with subsequent presentation of stroke due to embolism. LA enlargement is also a marker for structural heart disease and systemic hypertension. This study is being done to find out if there is a link between a big left atrium and an ischemic stroke.

Materials and Methods: This was a retrospective case-control study of 196 hypertensive adults which included radiologically confirmed ischemic stroke patients and patients with left atrial enlargement that was measured using 2-dimensional transthoracic echocardiography. Left atrial diameter was compared between equally divided cases and controls and an association was studied between left atrial enlargement and the risk of developing ischaemic stroke and also with other predetermined variables.

Results: A total of 98 cases with ischemic stroke along with 98 (age and gender matched) controls were included in the final analysis, where the mean age was 58.42 ± 9.67 and 59.14 ± 9.55 among cases and controls, respectively. There were 77 males and 21 females in the case group and 71 males and 27 females in the control group. 76 cases and 28 controls had left atrial enlargement. Among them, 61 cases and 12 controls had moderate to severe enlargement, which was statistically significant. Left atrial enlargement was found to be more prevalent in patients with associated co-morbidities like hypertension, diabetes mellitus, and dyslipidaemia. A left atrial diameter of more than 4.35 cm in patients with hypertension was considered as a predictor of stroke with a diagnostic accuracy of 78%.

Conclusion: Hypertensive patients with moderate to severe left atrial enlargement are at a much higher risk of developing an ischaemic stroke, which would most probably be due to a cardioembolic cause. 2D echocardiography should be performed in all patients presenting with risk factors for stroke, especially hypertensive patients, in order to assess the left atrium and

take early measures to prevent the development of cardioembolic ischaemic cerebrovascular accidents.

AAPI-23-OR-009: Screening for Isolated Hepatitis B Core Antibodies in Greater Philadelphia

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Background: Hepatitis B virus (HBV) screening programs often do not test for the core antibody (anti-HBc). A result of isolated anti-hepatitis B core (IAHBc) could indicate a chronic occult bloodstream infection, necessitating further testing due to deadly endpoints, such as hepatocellular carcinoma. This study assesses the prevalence and risk factors associated with anti-HBc and IAHBc within people at high risk for HBV in Philadelphia.

Methods: Participants (n=177) were screened for surface antigen (HBsAg), surface antibodies (anti-HBs), and anti-HBc during Hepatitis B Foundation screening events. Participants were asked to fill out a demographics survey addressing the risk factors and social determinants for HBV. Participants were contacted with their results and organized into screening groups: at risk, immunized, resolved, current infection, and IAHBc. Chi-square tables and Firth logistic regression were used to describe the data and to assess the odds of IAHBc within each screening question.

Results: The findings indicate that IAHBc had a prevalence of 7.3% (n=13) within our study population. The odds of anti-HBc are increased for immigrants from the Western Pacific (4.5%) and Africa (11.9%). Individuals born in Africa had 7.93 greater odds for IAHBc than those born in the Americas, and these odds are multiplied by 1.01 for every 1-year increase in age. There were no differences in odds based on whether an individual was vaccinated, had health insurance, or a primary care provider.

Conclusion: These findings suggest that many of Philadelphia's high-risk HBV population may be missed due to IAHBc, with an increased risk of HCC and cirrhosis in the future.

AAPI-23-OR-010: Racial Disparities in Spine Surgery: A Systematic Review

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Study Design: Systematic Review.

Objectives: To synthesize previous studies evaluating racial disparities in spine surgery.

Methods: We queried PubMed, Embase, Cochrane Library, and Web of Science for literature on racial disparities in spine surgery. Our review was constructed in accordance with Preferred Reporting Items and Meta-analyses guidelines and protocol. The main outcome measures were the occurrence of racial disparities in postoperative outcomes, mortality, surgical management, readmissions, and length of stay.

Results: A total of 1753 publications were assessed. Twenty-two articles met inclusion criteria. Seventeen studies compared Whites (Ws) and African Americans (AAs) groups; 14 studies reported adverse outcomes for AAs. When compared with Ws, AA patients had higher odds of postoperative complications including mortality, cerebrospinal fluid leak, nervous system complications, bleeding, infection, in-hospital complications, adverse discharge disposition, and delay in diagnosis. Further, AAs were found to have increased odds of readmission and longer length of stay. Finally, AAs were found to have higher odds of nonoperative treatment for spinal cord injury, were more likely to undergo posterior approach in the treatment of cervical spondylotic myelopathy and were less likely to receive cervical disk arthroplasty compared with Ws for similar indications.

Conclusions: This systematic review of spine literature found that when compared with W patients, AA patients had worse health outcomes. Further investigation of root causes of these racial disparities in spine surgery is warranted.

AAPI-23-OR-011: Post COVID APLA Syndrome; Shanthanand Sreekar MBBS, Sahithya Ekasi MBBS

Introduction: Catastrophic antiphospholipid syndrome, "is defined by the clinical involvement of at least three different organ systems over a period of days or weeks with histopathological evidence of multiple occlusions of large or small vessels. We report a case of catastrophic APLA diagnosed in our hospital in Covid recovered patient.

Chief complaints: A 37-year-old female patient brought to the OPD with chief complaints of

Painful ulcers over the lateral malleolus of both legs since 3 months, breathlessness for 4 days.

History: 4 months prior to admission, patient had onset of fever and tested positive for COVID-19 which got resolved. 3 months prior to admission, the patient had onset of scratching over the left malleolus which gradually progressed leading to painful ulceration f/b right side 10 days later. 4 days prior to admission the patient had onset of breathlessness of grade 2-3. One day prior to admission patient passed dark colored stools. 4 hours after admission to the emergency room patient had sudden onset of involuntary movements of the left foot and which progressed to involve all 4 limbs associated with frothing from mouth, up rolling of eyes, hypotonia of left upper limb and lower limb with power 0, deviation of mouth to

the right. Patient is a known case of Bronchial Asthma since childhood on rotahalers occasionally. Patient is congenitally blind. Patient has a history of 3 abortions in which two are induced and one is spontaneous, patient has irregular cycles for two months.

Investigations: CBP, Elevated PT, APTT and INR. D-dimer is elevated. ANA IF-mild reactive and ANA immunofluorescence was normal. DCT and IDCT were negative.

Treatment: Patient was treated with inj. heparin, iv antibiotics, low dose steroids. Hemodialysis was done in view of hyperkalemia. Blood transfusion was done, and fresh frozen plasma was given. Plasmapheresis was done as the patient's condition started to deteriorate.

Poster Presentations:

AAPI-23-PO-001: A Rare Presentation of Large Fusiform Thoracic Aneurysm Leading to Compression of the Left Pulmonary Artery and Left Lung

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An aneurysm is an irreversible pathological dilatation of a segment of a blood vessel (>50% of diameter) involving all three layers of the vessel wall. It may be fusiform or saccular involving the thoracic or abdominal aorta. The most common etiology is degenerative aneurysms may be due to atherosclerosis or medial degeneration of the aorta. So, hypertension, smoking, aging, hypercholesterolemia, and atherosclerosis are very important risk factors for aneurysms. There may be genetic disorders like Marfan's syndrome, Ehlers-Danlos syndrome, Turner syndrome, bicuspid aortic valve, or rarely infective aortitis like syphilis, tuberculosis, mycotic or vasculitis or rarely rheumatic cause.

We present a case of an elderly female. Investigation revealed a very large fusiform-shaped aortic arch aneurysm involving the distal thoracic aorta also leading to compression of the left lung parenchyma and left pulmonary artery.

Contrast-enhanced computed tomography of the chest suggestive of a fusiform aneurysm measured 5 cm in length involving the distal arch of aorta (distal to left common carotid origin) and proximal descending thoracic

aorta with surface ulceration and large intramural thrombus with bilateral mild pleural effusion, inferior compressive displacement of a left pulmonary artery leading to moderate pulmonary artery hypertension, mild compressive displacement of esophagus and trachea and compressive collapse of the left lower lobe.

Digital angiography of the aorta is suggestive of a 5 cm length of the aneurysmal segment, the transverse diameter of 95 mm, and craniocaudal diameter of 64 mm of the vessel wall.

AAPI-23-PO-002: Orbital Pheochromocytoma

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Objective: We conducted an extensive review of the literature to provide physicians with clinical knowledge for the disease process, clinical presentation, diagnosis, and management of orbital pheochromocytoma.

Methods: PubMed was searched, and studies were evaluated related to orbital/metastatic pheochromocytoma and paraganglioma.

Results: This extremely rare condition has an incidence of 8 per 1,000,000 persons per year. It is caused by metastatic spread of pheochromocytoma or paraganglioma of the orbit. Pheochromocytoma metastasis is associated with a 5-year survival rate ranging from 50-70%.

Symptoms are due to catecholamine release as well as mass effect on surrounding structures and include orbital edema, proptosis, ophthalmoplegia, diplopia, and blurry vision. Workup for orbital pheochromocytoma should include a full oculoplastic examination, biochemical testing, and imaging. MRI is the imaging modality of choice; however, functional imaging can assist in clinical decision making. Genetic testing may be considered in certain circumstances as pheochromocytomas and paragangliomas occur in the setting of multiple hereditary syndromes.

Conclusion: Diagnosis can be difficult as pheochromocytoma produces symptoms of many conditions including carcinoid syndrome, hyperthyroidism/thyroid eye disease, and adverse pharmacological symptoms. Following diagnosis, surgical removal is the mainstay of treatment. Extensive preoperative, perioperative, and postoperative precautions should be taken as manipulation of the tumor may produce catecholamine release resulting in life-threatening complications. When complete resection of the tumor is not possible, additional treatments include chemotherapy, radiation, radiofrequency ablation, and cryoablation. Once treated, metanephrine levels are obtained to detect persistent disease and life-long annual biochemical testing is used to assess for recurrence.

AAPI-23-PO-003: Knowledge Concerning Physical Therapy Interventions for Neck Pain among Referring Physicians for Interdisciplinary Care Improvement: A Survey on Clinical Practice Guideline Usage

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Introduction: Neck pain is an orthopedic condition for which physicians commonly refer to physical therapy (PT). Limited data exists on the extent of knowledge among referring physicians regarding the most recent PT clinical practice guideline (CPG). The purpose of this study is to determine physician knowledge about evidence-based PT treatment for neck pain.

Methods: Physicians (n=500) were surveyed within one hospital system to determine their knowledge of PT when referring patients with neck pain. Data recorded included specialty, years of practice, frequency of treating neck pain,

frequency of referring neck pain to PT, interventions that the physicians desire to see being used (pick five), interventions that are being used (pick five), impression that PT is helpful, and willingness for education.

Results: Physician responses (n=23) were most commonly from family medicine (n=11) and orthopedic surgeons (n=6). Neck pain was frequently treated by physicians and referred to PT. The most desired interventions included upper trapezius stretches (65%), massage (56%), and cervical mobilization (47%). Lowest desired interventions included thoracic manipulation (4%) and using ice (17%). Interventions that physicians see being used on their patients include general UE exercise (56%), cervical mobilization (39%), electrical stimulation (34%), soft tissue massage (30%), and dry needling (30%). Most physicians were open to further education regarding neck pain treatment (73%).

Conclusion: Many of the surveyed physicians commonly refer to PT for neck pain. Among the interventions that physicians listed, support from CPG recommendations for PT treatment was mixed. Further research is needed to determine the impact on outcomes.

AAPI-23-PO-004: The Incidence of Postoperative Shoulder Stiffness based on Tear Extent after Arthroscopic Rotator Cuff Repair: A Systematic Review

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Introduction: Rotator cuff tear (RCT) is a common musculoskeletal shoulder condition frequently treated with arthroscopic rotator cuff repair (ARCR) after conservative interventions have failed. Postoperative shoulder stiffness (POSS) is a common complication after ARCR that can impact patient outcomes. The purpose of this study is to determine the incidence of POSS after ARCR in total and based on tear extent prior to ARCR.

Methods: A systemic review was performed using PubMed, CINAHL, MEDLINE, and ScienceDirect databases. Search terms were "Rotator cuff repair" AND "Arthrofibrosis" OR "Postoperative shoulder stiffness." Inclusion criteria was

RCT with subsequent ARCR and presence of POSS documentation.

Results: Twenty-five articles out of 284 articles met the inclusion criteria for patients who received ARCR for RCT. Out of all patients (n=9,373), 597 patients had POSS (6.4%) as a complication. Out of the 2,424 patients with a specified tear pattern, 96 out of 1,862 (5.2%) patients with full thickness tears and 58 out of 562 (10.3%) patients with partial thickness tears had POSS after ARCR. Partial thickness tears are associated with higher rates of POSS after ARCR as compared to full thickness tears (p<0.001).

Conclusions: Overall, POSS is a common complication after ARCR with a total incidence of 6.4%. POSS is a more frequent complication in patients who receive ARCR for partial thickness RCT (10.3%) as compared to patients who receive ARCR for full thickness RCT (5.2%). More research is needed to determine other factors impacting the incidence of POSS after ARCR to reduce the risk of occurrence.

AAPI-23-PO-005: Gender Reassignment in a Rare Case of 11-Hydroxylase Deficiency in a Male with XX Karyotype and Complete Androgen Insensitivity Syndrome

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Introduction: Congenital Adrenal Hyperplasia (CAH) is a group of disorders confining enzyme deficiencies in adrenal glands. This report is a case of congenital adrenal hyperplasia due to 11 β -hydroxylase deficiency in a 20-year-old male who presented with cyclical hematuria, history of hypertension, precocious puberty and severe virilization with birth sex as male.

Objective: The case being reported is very rare form, which accounts for 0.2 to 8% of CAH. Its prevalence is around 1 in 100,000 to 200,000 live births. We report asymptomatic hematuria as a noteworthy diagnostic characteristic in later stages of this condition.

Methods: A 20-year-old male, presented with a complaint of reddish urine for the last six months. Incidentally, hypertension was also detected during the evaluation.

Investigations revealed hypokalemia, elevated sex steroids, and elevated 11-deoxycortisol levels. The karyotype analysis revealed a 46, XX.

Result: Abdominal and pelvic imaging revealed enlarged hyperplastic adrenal glands bilaterally with normal mullerian structures and bilateral ovaries. Also, vagina communicated with the posterior part of the urethra. The scrotum appeared empty, with no detectable testes in either scrotum or inguinal regions. Furthermore, bilateral medullary nephrocalcinosis was present. Subsequently, the patient was admitted and underwent a total abdominal hysterectomy and bilateral salpingo-oophorectomy. Following the procedure, testosterone replacement therapy was initiated.

Conclusion: Despite being included in neonatal screening programs in several countries, the diagnosis of CAH often goes unnoticed in many developing countries due to limited awareness and financial constraints. Timely diagnosis and treatment play a crucial role in preventing complications like adrenal crisis, precocious puberty, and growth failure.

AAPI-23-PO-006: The Novel Sequence of Photorefractive Keratectomy after Corneal Transepithelial Crosslinking in a Keratoconus Patient: A Case Report

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Background: Keratoconus (KCN) is a devastating corneal disease involving progressive thinning and central scarring of the cornea which can progress to severe myopia and irregular astigmatism. It affects both pediatric and adult populations and most often presents in the second decade of life. Keratoconus has been historically considered an absolute contraindication to vision correction surgery such as photorefractive keratectomy (PRK), leaving KCN patients few viable options for vision correction.

Purpose: To provide a possible route of vision correction to a previously excluded patient population, we present a case where a KCN patient undergoes a novel sequence of transepithelial corneal crosslinking (CXL) followed by PRK with excellent outcomes.

Case Report: A 29-year-old male presented with bilateral blurry vision (20/100 OU) and after comprehensive history, detailed exam, and imaging including corneal topographies, was ultimately diagnosed with progressive keratoconus OU. The patient was treated initially with transepithelial (epithelium-on) CXL and six months later was treated with PRK. Over a period of 35 months of follow-up, the patient's visual acuity was substantially improved (20/15 -2 OU). On examination, the corneas were clear with no haze or scarring. Pentacam topographies with different maps were obtained and showed no progression of the KCN. Our patient had no postoperative adverse events and both the vision and corneal curvature remained stable.

Conclusion: Corneal stabilization via epithelium-on CXL followed by PRK is a potentially underexplored and viable treatment option for select KCN patients. Larger studies are needed to determine generalizability of this novel approach.

AAPI-23-PO-007: Public Perception of Rotator Cuff Tears

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Introduction: Understanding public knowledge of rotator cuff tears (RCTs) is limited. This study aimed to assess baseline understanding and evaluate improvement following an educational intervention.

Methods: This study utilized an online 36-question survey to measure an individual's baseline understanding of RCTs and after watching an educational video. Participants were recruited through online and social media platforms. Demographic data was collected and analyzed for correlations to survey performance.

Results: 382 participants completed the survey (56% men, 64% Caucasian). 36% had a Master's degree or higher, 21% had healthcare experience, and 39% had a RCT themselves or knew someone with an RCT. All these demographic factors were significant in predicting baseline knowledge at $p < .001$. Baseline average correct responses were $47 \pm 18\%$, improving to $68 \pm 23\%$ after the video. Common misconceptions included the role of the rotator cuff, the most frequently affected age group, risk factors for injury, presentation, length of hospital stay, and post-surgery

pain medication requirements. Overall, participants did not rate their understanding of RCTs very highly with 56% rating themselves as having very little or no knowledge. Participants' self-rating of their knowledge of RCTs was significantly correlated with their performance ($p < .001$).

Conclusion: Baseline knowledge of RCTs among the public was poor. An educational video increased knowledge by 21%. Gender, race/ethnicity, education, medical employment, personal experience, and self-rated understanding significantly correlated with survey performance. Significant improvements were observed in various survey sections, including anatomy, injury risks, treatment, surgical risks, management, and post-surgical expectations.

AAPI-23-PO-008: Outcomes of Pedicled Groin Flaps in Upper Extremity Injuries

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Introduction: Free flap reconstruction has gained popularity for upper extremity injury reconstruction, surpassing pedicled groin flaps. However, there is a lack of literature guiding surgeons and patients on the outcomes of groin flaps.

Methods: A retrospective case series was conducted at Vanderbilt University Medical Center, examining patients who underwent pedicled groin flaps for upper extremity injuries between 1992 and 2022. Data collected included patient and injury characteristics, surgical management, and complications. Ordinal logistic regression and univariate/multivariate analysis were performed to assess the relationship between groin flap surgeries, complications, and patient/injury characteristics.

Results: The analysis included 88 pedicled groin flaps performed for upper extremity injuries, with a median follow-up of 1.14 years. The median patient age was 35, and patients underwent a median of 4 surgeries. The most common complications were stiffness (90.6%), partial flap loss (38%), and infection (32%). Traumatic injuries increased the likelihood of requiring more surgeries ($p < .05$). No significant differences in complications were found based on patient and injury characteristics.

Conclusions: Patients undergoing pedicled groin flaps for upper extremity injuries typically undergo four surgeries, with traumatic injuries indicating a higher surgery requirement. This study, while the largest investigation of pedicled groin flaps to date, had a relatively small sample size, potentially limiting statistical power. Larger studies with extended follow-up or direct comparisons of pedicled groin flap and free flap cohorts can provide further insights into the utility of pedicled groin flaps in the free flap era.

AAPI-23-PO-009: A Novel Transgenic Mouse Burn Model Forms Dyschromia

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Hypertrophic scar (HTS) is thick, erythematous, non-pliable, pruritic, and painful. Additionally, dyschromia develops pervasively in HTS amongst skin color patients and impacts quality of life. There are currently no mechanistic treatments available for dyschromia due to limited animal models. C57BL/6 mice lack melanocytes, and therefore don't serve as good models to study skin-specific dyschromia. Cg-Tg(KRT14-Kitl*)4XTG2Bjl/J mice have epidermal melanocytes creating skin that is morphologically and functionally similar to human skin in the realm of pigmentation, but these mice have never been used in burn modeling. Cg-Tg(KRT14-Kitl*)4XTG2Bjl/J and C57BL/6 mice were burned at 10% TBSA and full thickness depth using a scald model. Wounds healed and formed "pseudo-scars". At days 35-56 post-burn, melanin index was measured in hyper-, hypo-, and normally pigmented scar and skin areas. Scar samples were taken and prepared for histology. Burn injury in mice with epidermal melanocytes led to development of hyper- and hypo-pigmentation, but not in controls.

AAPI-23-PO-010: Arterial stiffness is Associated with Menopause: A Cross-Sectional Study from Gujarat, India

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Background: Menopause is a risk factor affecting cardiovascular health in mid-life women, studied in terms of blood pressure mostly. Arterial stiffness (AS) is a direct surrogate that can be measured by pulse wave analysis (PWA) with scarcity of data from our region.

Aim of study: We studied this AS and menopause association using PWA.

Materials and Methods: A cross-sectional study was performed in 134 middle aged females divided in groups with or without menopause. Oscillometric PWA was done using Mobil-o-Graph (IEM, Germany). Augmentation pressure, Augmentation index at heart rate 75, aortic pulse wave velocity, total arterial stiffness and pulse pressure amplification were arterial stiffness parameters reported. They were further compared between groups and in relation to BMI. Multiple regressions were used to find significant predictors of AS. $P < 0.05$ was taken as statistical significance.

Results: - As compared to the premenopausal group, postmenopausal women were significantly older, physically inactive with comparable BMI. The postmenopausal group showed raised AS but only aPWV was significantly different. BMI was not associated with a significant difference in AS in postmenopausal group. Age (except for aPWV), BMI and HR (except for Alx@75) were insignificant predictors while SBP in pre-menopausal and DBP in postmenopausal group were major AS predictors.

Conclusions: In obese, predominantly sedentary midlife Gujarati women, menopause negatively affects arterial stiffness, central more than peripheral. Menopause accelerates cardiovascular aging independent of BMI and age and is suggested as a significant risk factor to be considered and explored further.

AAPI-23-PO-011: A comparative Cross-sectional Study of Cardiac Autonomic Status by 5 min Heart Rate Variability in Population with/without Type 2 Diabetes and/or Hypertension

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Diabetes and hypertension are known to co-exist frequently as adverse cardiovascular risk factors. Both can produce cardiac autonomic neuropathy that can be measured by RR interval-based heart rate variability (HRV) on ECG. We compared 5 minutes HRV in four groups based on diabetes and hypertension. Methods: A cross sectional study was done on 203 participants divided into four groups-diabetics, hypertensives, diabetic-hypertensives and normotensive-nondiabetics. They were evaluated for current disease control and five minutes HRV ECG was done in supine condition following standard protocols by Variowin HR Software. HRV parameters of time domain, frequency domain and Pointcare plot were compared between groups and associated with gender, glycaemic control and blood pressure control. Statistical significance was set at $p < 0.05$. Results: Three diseased groups had mean age in mid-fifties, mean duration of disease > 6 years, comparable BMI, poor glycaemic and blood pressure control. As compared to the normal group, three diseased groups exhibit reduced HRV with respect to all three domains of HRV with varying statistical significance. Among diseased groups, HRV was associated with blood pressure control better than glycaemic control but not with gender. LF /HF ratio was the most consistent HRV parameter showing statistical significance in tests. Conclusion: HRV is reduced in both diabetics more than hypertensives; related to blood pressure control more than glycaemic control. It points to altered cardiac autonomic balance, and possibility of cardiovascular risk and early detection of it with timely intervention. It also calls for investigation of the same for reinforcement of our observations and further exploration.

AAPI-23-PO-012: "Navigating Complexity: A Challenging Case of Progressive Encephalomyelitis with Rigidity and Myoclonus Complicated by Deep Vein Thrombosis and Septic Arthritis"

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We present a complex case of a 53-year-old patient with progressive encephalomyelitis with rigidity and myoclonus (PERM) who experienced acute deep vein thrombosis (DVT) and septic arthritis. The patient initially presented with weakness in all four limbs, altered behavior, and involuntary movements in the right upper limb. Neuroimaging revealed abnormal signals and increased perfusion in various brain regions. Broad-spectrum antibiotics, antiviral medication, corticosteroids, antiepileptic drugs, and nutritional support were administered. Due to the rapidly progressive symptoms, autoimmune etiology was suspected, leading to intravenous immunoglobulin (IVIG) treatment. The patient tested positive for Gad-65 antibodies. Blood investigations showed an elevated white blood cell count with *Klebsiella pneumoniae* infection, sensitive to colistin and resistant to most antibiotics. Clinical examination demonstrated neurological abnormalities and signs of meningeal irritation. Tonic-clonic episodes persisted, and EEG findings indicated abnormal discharges. Antiepileptic drugs were initiated. Post-treatment, the patient developed swelling and limited mobility in the right lower limb, diagnosed as acute DVT. PET-CT scans detected periaricular collection in the left hip joint and intramuscular collection in the left obturator internus muscle, suggestive of septic arthritis with intramuscular abscess.

This case highlights the complexity of PERM and emphasizes the need for multidisciplinary management, including autoimmune and infectious disease expertise. Awareness of potential complications such as DVT and septic arthritis is crucial for comprehensive patient care in similar challenging cases.

AAPI-23-PO-013: “Double Trouble: Unusual Presentation of Cor Triatriatum Sinistrum Complicated by Myocardial Infarction”

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Cor Triatriatum Sinistrum (CTS) is a rare congenital heart defect characterized by a fibromuscular membrane dividing the left atrium, leading to obstruction of blood flow from the pulmonary veins to the left ventricle. We present a case of a 37-year-old Indian male labourer who with no significant medical history who presented with sudden onset chest pain, breathlessness, palpitations, and a brief loss of consciousness. Initial investigations were normal, but transthoracic echocardiography revealed the characteristic findings of CTS. Further confirmation was obtained through transesophageal echocardiography. Surgical excision of the membrane was performed successfully, resulting in rapid improvement. However, the patient was later presented with an unusual complication of myocardial infarction (MI), requiring percutaneous coronary intervention (PCI). This case highlights the rarity of CTS in adult patients and emphasizes the importance of comprehensive evaluation and timely intervention in managing this condition. The occurrence of MI as a complication in this case serves as a reminder of the potential coexistence of other cardiac conditions in patients with CTS. Early diagnosis and intervention are crucial for improving outcomes and preventing further complications. Vigilant monitoring and appropriate follow-up care are essential for individuals with congenital heart defects to ensure optimal long-term management.

AAPI-23-PO-014: “From Red to Radiant: Examining the Efficacy of Intralesional Tranexamic Acid in Treating Erythema-Telangiectasia of Acne Rosacea”

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Background: Acne rosacea is a chronic inflammatory skin disorder characterized by persistent erythema and telangiectasias. Despite the availability of various treatments, managing erythema and telangiectasias in acne rosacea remains challenging. Tranexamic acid, an antifibrinolytic agent, has demonstrated efficacy in treating

erythema and telangiectasias in other dermatologic conditions.

Methods: This retrospective case series aimed to assess the safety and effectiveness of intralesional tranexamic acid for treating erythema and telangiectasia in 12 patients with acne rosacea who were unresponsive to standard therapies. Patients received monthly intralesional injections of tranexamic acid (10 mg/mL) for three months.

Results: Out of the 12 patients, 10 (83.3%) exhibited improvement in erythema and telangiectasia following the three-month treatment course. The mean erythema score decreased significantly from 2.8 at baseline to 1.5 at the end of treatment. Background: Acne rosacea is a chronic inflammatory skin disorder characterized by persistent erythema and telangiectasias. Despite the availability of various treatments, managing erythema and telangiectasias in acne rosacea remains challenging. Tranexamic acid, an antifibrinolytic agent, has demonstrated efficacy in treating erythema and telangiectasias in other dermatologic conditions.

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AAPI-23-PO-015: Effect of Albumin Levels on Length of ICU Stay

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Background: Many factors play important extrapolative functions when it comes to invasive surgery. The effects and prognostic role of preoperative malnutrition and low serum albumin (SA) levels in patients undergoing cardiac surgery remains unclear. The aim of this specific study was to investigate the relationship of preoperative hypoalbuminemia (serum albumin >4.2 g/dL) and increase in length of ICU (intensive care unit) stay in postoperative cardiac patients (which included CABG, valve surgery, or combined CABG & valve surgery).

Methods: This study is a retrospective observational study which was registered and approved by the local ethics committee. A total of 991 patients were screened at St. Petersburg State Uni. Hospital. Inclusion criteria consisted of: >18yrs of age and had elective cardiac surgery, screened for serum albumin levels. All enrolled patient information was collected on Mendelay Data and statistical analyses performed through STATA version 17. We analyzed patients who identified as having hypoalbuminemia preoperatively (serum albumin >4.2 g/dL) and performed a linear regression model to determine the association with length of stay in ICU.

Results: A total of 991 patients met the eligibility criteria and were included in the study population. Of those, 231(23.3%) patients were identified as having preoperative hypoalbuminemia.

We used a linear regression with the length of ICU stay as a continuous variable and hypoalbuminemia as the exposure. From the calculations, the unadjusted analysis for linear regression shows that the exposure-preoperative albumin does not have a significant role in determining the outcome (length of stay in the ICU). The p value was not statistically significant (0.030).

Conclusion: From the acquired results, we were able to conclude that preoperative hypoalbuminemia does not have an impact and is not associated with increase in length of stay in ICU after undertaking heart surgery.

AAPI-23-PO-016: Inequities in Cataract Surgery Follow-up and Intraocular Lens Selection by Race: A Retrospective Study

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Purpose: Over 3 million patients receive cataract surgery annually, however little is known about racial inequities regarding the timeline or intraocular lens (IOL) selection. This study examines differences in procedural follow-up outcomes and IOL selection between black and Caucasian counterparts.

Methods: A retrospective study identified cataract patients with insertion of an IOL by 2022 CPT code 66984 or 66982. 11,711 patients aged 18-100 years old were identified with 9879 (84.4%) being Caucasian. Each patient's visual acuity and days between surgery and follow-up were recorded. Comparisons were analyzed through a chi squared and t-test.

Results: Black and Caucasian patients had a similar mean (SD) grade of 2.274 (0.786) and 2.283 (0.794), respectively. 93.35% (95% CI 92.018% - 94.480%) of black patients completed their first follow-up compared to 91.12% (CI 90.398% - 91.796%) of their Caucasian counterparts (p=0.0043). 78.8% (CI 76.6 - 80.7%) of black patients followed up a second time within 10 days versus 80.6% (CI 79.6 -81.5%) of Caucasian patients (p=0.1141). 98.9% (CI 98.2% - 99.3%) of black patients received a standard lens compared to 93.8% (CI 93.3% - 94.3%) of Caucasian patients (p<0.0001).

Conclusions: Black patients had significantly higher first follow-up rates and similar second follow-up rates. Black patients had similar cataract grade and visual impairment at referral date and were significantly less likely to receive premium IOL compared to Caucasian patients.

AAPI-23-PO-017: Utility of Diffusion Weighted Imaging as a Problem-Solving Sequence on Brain MRI

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Diffusion weighted imaging uses varying gradient strengths in order to dephase the imaged tissue resulting in decreased signal return. The further water moves (diffuses) the more it will be dephased. Therefore, water molecules that are trapped will have less exposure to the varying gradient strengths allowing them to maintain a relatively elevated signal. Different disease processes display different mechanisms responsible for restricted diffusion, including cytotoxic edema, hypercellularity, viscous fluid, demyelination, etc. While all these mechanisms can lead to restricted diffusion, there are characteristic patterns which can be invaluable when making a diagnosis. Although many disease processes can restrict the diffusivity of water molecules, there are specific patterns of restriction which can be of vital importance. These specific patterns of restricted diffusion can help to

narrow the differential diagnosis and make a dramatic difference for the patient. Some of the specific patterns to be discussed include the presentation of ischemic stroke, abscess, hypercellular tumor including primary CNS lymphoma, demyelination, encephalitis, epidermoid cyst, Creutzfeldt-Jakob disease, diffuse axonal injury, and intracranial hemorrhage on diffusion weighted imaging. A few sequences (prior to the DWI) will be shown per case to allow the participant to develop a differential diagnosis. Following the initial sequences and development of a differential, the DWI sequence will be shown with emphasis on the specific features in hopes to improve diagnostic accuracy amongst the participants. Diffusion weighted imaging can be an excellent problem-solving sequence in cases where there is a diagnostic dilemma. Familiarity with specific patterns can aid physicians in the formation of a more accurate differential.

AAPI-23-PO-018: Alternative Treatment Option for Spinal Epidural Lipomatosis

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Spinal epidural lipomatosis (SEL) is a rare process in which hypertrophy of the adipose tissue in the spinal canal occurs. Presenting symptoms can include back pain, lower-extremity weakness and sensory changes such as numbness and paresthesia. [1] Causes of SEL are long term use of exogenous steroids, obesity and less commonly endocrine disorders. [1] Treatment of this condition is mostly focused on treating the underlying cause. [2] Thus, in idiopathic cases there is a great challenge in effective treatment options. If medical management fails, surgical decompression can be considered and results in immediate symptom relief. [3] However, surgery is not a long-term solution as adipose tissue can re-accumulate. In this case study, we examine a 64-year-old female who presented to an outpatient pain management clinic with symptoms of generalized neuropathic pain consistent with allodynia in her right lower extremity. An MRI of her lumbar spine revealed epidural lipomatosis at the levels of L4 and L5 resulting in encasement of the traversing lumbosacral nerve roots. After evaluation by neurosurgery, the patient was not deemed a candidate for surgical decompression due to the generalized nature of her symptoms, rather than presenting with a specific dermatomal distribution. She started taking pregabalin three times daily and

reported complete resolution of her symptoms at subsequent follow up visits. Given this patient's success, we present pregabalin as a treatment option for providing symptomatic relief in patients with a very challenging diagnosis such as SEL to treat.

AAPI-23-PO-019: Consumption of Red Versus White Wine and Cancer Risk: A Meta-Analysis of Observational Studies

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Objective: To perform a meta-analysis examining the association between consumption of wine intake (red, white) and risk of all and site-specific cancer.

Data extraction and synthesis: We conducted a random-effects meta-analysis to estimate RRs and 95% CIs for an association between wine intake and cancer risk, overall and by cancer site. We performed meta-regression to examine whether cancer risk differs by type of wine (red or white).

Results: The summary RR for the risk of all cancer (n=96,357) comparing the highest versus lowest level of wine intake was not significantly different by type of wine (red: RR=0.97, 95% CI=0.88 to 1.07, white: RR=1.02, 95% CI=0.93 to 1.11, Interaction=0.48). For individual cancer sites, there was a significant difference in associations between red and white wine intake only in skin cancer risk (Pinteraction=0.0003). White wine intake was associated with a 22% increased risk of skin cancer (RR=1.22, 95% CI=1.14 to 1.30), while no association was observed for red wine intake. We observed increased risks of breast cancer for both wine types (Pinteraction=0.61).

Conclusions: In this meta-analysis of wine and cancer risk, we observed no difference in associations between red or white wine consumption on overall cancer risk. White wine intake, but not red wine intake, was significantly associated with increased risk of skin cancer but not with other cancers.

AAPI-23-PO-020: A Case of Leukocytoclastic Vasculitis After Novel Coronavirus-19

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Introduction: There is a large amount of unknown in management of diseases occurring after diagnosis of Coronavirus-19 (COVID-19). I have presented below a case of unique clinical symptoms of vasculitis that occurred in a patient months after she was diagnosed with COVID-19.

Case Presentation: The patient is a 41-year-old female who presented to her rheumatologist for skin lesions and a history of pericarditis. The patient was diagnosed with COVID-19 about 6 months prior to referral to Rheumatology. During that time, she had a complicated course of COVID-19 requiring admission to the cardiac critical care unit for 4 days for pericarditis found on cardiac magnetic resonance imaging which was treated with Colchicine. The patient was stable after that admission until about 5 months prior to referral visit, around when the patient started developing cutaneous lesions diffusely throughout her body. The lesions would blister and pop, causing significant redness on her extremities. A skin biopsy was done one month prior to her rheumatology visit by the patient's dermatologist, which showed superficial and deep perivascular and peri-adnexal dermatitis with vasculopathy. The patient reported no past medical history of autoimmune disease, but given biopsy findings of vasculitis, the patient was referred to rheumatology. Laboratory work-up showed antinuclear antibody of <1:80 (0.0-4.9 U/mL), C4 complement of 32 mg/dL (14-44 mg/dL), C3 complement of 147 mg/dL (85-165 mg/dL), C reactive protein of 13.5 mg/L (0.0-6.0 mg/L), erythrocyte sedimentation rate of 12 mm/h (0-20 mm/h), C-ANCA and P-ANCA undetectable. Despite negative autoimmune panel work-up, the patient's clinical diagnosis was consistent with leukocytoclastic vasculitis. The patient was initially started on 20 milligrams of Prednisone daily up to 40 milligrams a day. She was placed on Azathioprine and titrated up to 150 milligrams a day followed by starting Methotrexate and titrating up to 15 milligrams a week one-month later.

Conclusion: The onset of autoimmune disease after infection is poorly understood and often under-diagnosed. Further research must be done on patients suffering with symptoms of vasculitis diagnosed after COVID-19 infection.

AAPI-23-PO-021: The Effectiveness of the McKenzie Method for the Conservative Management of Neck Pain: A Systematic Review and Meta-Analysis

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Introduction: Neck pain is a common musculoskeletal condition frequently managed with numerous conservative interventions. The McKenzie Mechanical Diagnosis and Treatment (MDT) method is a form of physical therapy evaluation and treatment that aims to improve pain and disability in patients with musculoskeletal pain, especially neck pain. The purpose of this study is to examine the effectiveness of McKenzie MDT in adult patients with neck pain.

Methods: A systematic review and meta-analysis was performed using PubMed, ScienceDirect, MEDLINE, CINAHL, Web of Science, and Google Scholar. Full search terms were "McKenzie method" OR "McKenzie approach" OR "McKenzie treatment" AND "neck pain." Inclusion criteria was use of McKenzie MDT, Level I randomized control trials (RCTs), adults, and outcomes of pain (0-10 scale) and disability (Neck Disability Index).

Results: A total of 11 RCTs met final selection criteria from 1,955 articles with 289 patients receiving McKenzie MDT out of 677 total patients. There was a small but statistically significant improvement in pain (1.14/10 points) in patients receiving McKenzie MDT versus control ($p < 0.02$). There was no significant improvement in NDI score between McKenzie MDT versus control ($p = 0.19$). For severity of pain, there was a significant improvement in moderate or severe pain ($p < 0.01$), but not in mild pain ($p = 0.84$) when comparing McKenzie MDT to controls.

Conclusion: McKenzie MDT has small but statistically significant improvement in neck pain compared to controls, especially in patients with moderate to severe neck pain. Use of McKenzie MDT did not provide any significant improvement in disability compared to control.

AAPI-23-PO-022: *Saccharomyces cerevisiae* Pneumonia Complicating Adalimumab Therapy for Psoriatic Arthritis Status-post COVID-19 Pneumonia

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Introduction: Yeasts are widely used in food production and are considered safe but can have infectious implications in the right clinical setting.[1] We report a case of *Saccharomyces cerevisiae* pneumonia in a patient receiving adalimumab for psoriatic arthritis after COVID-19 pneumonia.

Case: 56 y/o male with hypertension, diabetes, interstitial lung disease, and psoriatic arthritis on adalimumab presented with a 6-month history of fever, cough, and dyspnea after hospitalization for COVID-19 pneumonia. ED vitals: T=101°F, 91% O₂ on RA. ED labs: leukocytosis (13x10⁹/L) and negative bronchoalveolar lavage (BAL) initial cultures. CXR revealed right lung base airspace disease. Patient was admitted for suspected bacterial pneumonia and placed on broad spectrum antibiotics. Final BAL cultures grew *Saccharomyces cerevisiae* while another infectious workup remained negative. Voriconazole was started for fungal pneumonia with initial clinical improvement and the patient was discharged. He returned to the ED 2 days later with T=103°F, 82% O₂ on RA, and worsening infiltrates on CXR. Patient was readmitted and started on Amphotericin B until labs confirmed *S. cerevisiae* sensitivity to voriconazole. The patient was discharged on voriconazole with adalimumab discontinuation.

Discussion: *Saccharomyces cerevisiae* is a yeast utilized in fermentation and baking.[1] It is an uncommon pathogen that can colonize human respiratory, gastrointestinal, and genitourinary tracts. Rare cases of opportunistic infections including fungemia, pneumonia, endocarditis, and liver abscesses have been reported.[2] Adalimumab, a TNF inhibitor used to treat autoimmune/inflammatory conditions, was thought to be responsible for this immunosuppressed patient, *S. cerevisiae* pneumonia.[3] This presents an emerging opportunistic pathogen to consider in the immunocompromised.

AAPI-23-PO-023: Ossifying Fibromyxoid Tumor Metastasized to the Lung Even After Complete Resectioning of the Primary Tumor

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Introduction: An ossifying fibromyxoid tumor (OFMT) is a soft tissue neoplasm with ambiguous differentiation and low metastatic potential. Mainly it arises in the lower extremities, trunk, upper extremities, and the head and neck region.

Case Presentation: A 64 years old male patient presented to the oncology outpatient office for a follow-up. His recent Computed tomography (CT) chest with contrast showed a new right upper lung lobe nodule measuring 0.78 cm compared to the previous CT chest six months ago. It was worrisome for metastasis. The patient had a history of malignant ossifying fibromyxoid tumor of the chest wall with a 4.0 cm lesion in the right paramedian chest wall peripheral to the sternum, resected with a positive posterior margin two years ago. Later on, additional surgery was performed to clear the deep margin. Post-operative radiation was completed. Pathology at that time showed 20 mitotic figures per 50 high-power fields, but no actual grade was given. The patient had some sensitivity in his central chest around his surgical site; otherwise, he was asymptomatic. In the current visit, the F-18 FDG positron emission tomography scan revealed the sub centimeter pulmonary nodules in the right upper lobe, which were not appreciably FDG avid, but was not below PET resolution. Bronchoscopy with biopsy of these nodules showed spindle cell neoplasm morphologically consistent with the patient's known history of malignant ossifying fibromyxoid tumor.

Conclusions: Even in asymptomatic patients with a history of OFMT, it is necessary to close long-term follow-up for recurrence or metastasis surveillance. Early recognition can decrease morbidity and mortality and improve overall organ function and patient survival.

AAPI-23-PO-024: Anticancer Activity of the Papaya Plant: A Narrative Review

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Cancer continues to be a pervasive disease as traditional treatments have plateaued in efficacy. Anticancer research continues to grow in an effort to find novel preventive and treatment measures for cancers. The Carica papaya plant presents an innovative approach for combating cancer. The papaya plant produces several biologically active phytochemicals, which exhibit anti-inflammatory, antibacterial, and anti-oxidative properties. This review explores studies examining these phytochemicals as potential therapeutics to prevent and treat cancers. Repeatable results present the papaya plant as a potential chemopreventive agent and a cancer therapeutic. Further in-vitro and in-vivo studies must be done to establish the papaya plant and its phytochemicals as an alternative to traditional cancer treatments.

AAPI-23-PO-025: Catastrophic Antiphospholipid Syndrome (CAPS) in a Patient with Antiphospholipid Syndrome and Refractory ITP

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Introduction: Catastrophic antiphospholipid syndrome (CAPS) is the most severe form of APS with multiple organ involvement developing over a short period of time, usually associated with micro thrombosis and hematological manifestations. Here we present a case of 65 Y/M with PMH of APLA and refractory ITP suddenly became altered with elevated creatinine and diagnosis of CAPS was made and managed with plasmapheresis.

Methods: A thorough literature review was conducted using PubMed and UpToDate

Case description: 65 Y/ M with PMH of APLA and refractory ITP got admitted to the hospital with complaints of petechial rashes and mucosal bleeding. CBC revealed severe thrombocytopenia and started on IVIG 1 g/kg for 5 days and PLT count was monitored daily. Patient was refractory to IVIG and started him on romiplostim (N plate) once weekly subcutaneous injection. The platelet count was gradually improved and reached 130K. Subsequently, the patient was stable and planned to discharge home. The

next day, the patient became altered and unable to recognize his family members and disoriented to time, place and person. Metabolic panel revealed elevated creatinine. With the concerned PMH of antiphospholipid syndrome (APS), altered sensorium with elevated creatinine, diagnosis of Catastrophic antiphospholipid syndrome (CAPS) was made. Patient caregivers were told about the morbidity and mortality associated with CAPS and decided to proceed with Plasmapheresis. A total of 5 sessions of Plasmapheresis were planned with volume exchange of 1.0 L. After the 2nd day of Plasmapheresis, the patient started opening his eyes spontaneously and regained oriented to time, place and person and was discharged home with oral anticoagulation.

Discussion: CAPS is a rare, life threatening form of APS characterized by severe thrombotic complications, usually microvascular as well as large vessel thrombosis, affecting multiple organs, that develop simultaneously or over a short period of time. What distinguishes CAPS from APS is the intensity and extent of the thrombotic process. Most individuals with CAPS have triple antiphospholipid antibodies (aPL) positivity with high titer immunoglobulin G (IgG) anticardiolipin and anti-beta2 Glycoprotein antibodies. APS and CAPS represent a spectrum of clinical disorders. Initially it may not be clear whether an (aPL) positive individual with or without a diagnosis of APS is having isolated microvascular and/or hematological complications of APS that will progress to a catastrophic presentation. The course may only become apparent when one or more macrovascular events has occurred.

CAPS is a challenging systemic disease. A prior diagnosis of APS should further increase the clinical suspicion. Therefore, it is critical to initiate the treatment urgently if the diagnosis of CAPS is clinically suspected, even without confirmatory(aPL)tests. CAPS is typically treated with a combination of anticoagulation, glucocorticoids and plasmapheresis. Patients are treated with therapeutic plasma exchange over five days. If there is high probability that CAPS is the diagnosis (patient with known APS who presents with multiorgan failure), plasmapheresis is initiated without delay.

AAPI-23-PO-026: A Clinic Dialogue Analysis of Patient-Raised Sexual Health Discussions Among Women with Breast Cancer

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Background: Clinicians often initiate breast cancer-related sexual health conversations. There is little known about the nature of such discussions when patients (rather than clinicians) raise the topic. We analyzed clinic dialogue from breast cancer patient-raised sexual health discussions to understand the number/type of sexual health topics raised and explore differences between women raising 1 or >1 topic.

Methods: Participants in a sexual health communication study (N=144) had a clinic visit audio-recorded and transcribed. For this analysis, dialogue from the subsample of visits where patients raised sexual health concerns was coded using a pre-set codebook. Women completed two validated sexual concerns/vaginal dryness items [Range=0-10]. Codes were summarized using Excel/SPSS. Women raising 1 versus >1 sexual health topic were compared using Chi-square or t-tests.

Results: Within the sample (N=32), most women (72%) raised one sexual health topic, 19% raised two topics and 9% raised three topics. Body image was most frequently discussed (41%), followed by vaginal dryness (25%), sexual interest (18%), breast appearance (7%), and sexual relationship (7%). Women raising >1 topic had worse vaginal dryness (Mean=7.0) and sexual concerns (Mean=8.3) than those raising 1 topic (Means=3.5 and 4.4, respectively, p 's <.05). Vaginal dryness and breast appearance were more commonly discussed in visits of women raising >1 topic than those raising 1 topic (p 's<.05).

Conclusions: Most patient-raised sexual health discussions focused on a single topic; raising multiple topics seemed to reflect greater clinical need. Future research should investigate topic prevalence in complex discussions and physician responses to patient-raised sexual health concerns.

AAPI-23-PO-027: Prosthetic Joint Infection Secondary to Mycobacterium Bovis Infection

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Mycobacterium bovis is a gram-positive, non-spore forming rod-shaped bacteria that falls under the *Mycobacterium tuberculosis* complex. It is commonly found in animals such as cattle and most commonly causes infection in humans via consumption of unpasteurized dairy products. The BCG vaccine contains a live-attenuated vaccine strain of *M. bovis* and is used as immunotherapy for bladder cancer. There are reports stating BCG immunotherapy causes increased susceptibility to prosthetic joint infection with *M. bovis*. Below we describe a case of confirmed *M. bovis* prosthetic joint infection in a 69-year-old male who had also been treated with BCG immunotherapy as part of the standard of care treatment of his bladder cancer.

AAPI-23-PO-028: A Comparative Study of Vaping and Cigarette Smoking in Teenagers and Young Adults During the COVID-19 Pandemic

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Background: The onset of the COVID-19 pandemic catalyzed a rise in the usage of nicotine vapes among teenagers and young adults, as it is being touted as a safer alternative to cigarette smoking. Although studies have been conducted to assess the negative effects of smoking and vaping, a comparative risk analysis has not yet been performed. This project aims to bridge the gap by comparing the incidence of several outcomes of smoking and vaping.

Methods: Data was obtained from TriNetX, a database of deidentified medical records. The population included patients, aged 15-30, who were diagnosed with either

vaping-related disorders or nicotine dependence (cigarettes) during the last 3 years. Cohorts were matched for age, sex, race, ethnicity, and COVID-19 positivity. Four outcomes were analyzed 1-year post diagnosis: pneumonia, asthma, anxiety and depression. Statistical analysis included risk differences with a significance value of $p < 0.05$.

Results: We identified 1,589 patients with vaping-related disorders and 148,292 patients with nicotine dependence (cigarettes). No significant difference between vaping and cigarette smoking was observed in anxiety (13.945% vs 14.573%) and depression (6.91% vs 7.789%). There was a significantly higher incidence of pneumonia (7.035% vs 0.754%) and asthma (12.437% vs 7.349%) among vapers as compared to smokers.

Conclusion: Vaping is associated with a higher incidence of respiratory conditions and an equal incidence of mental health conditions when compared to cigarette smokers. The study indicates that vaping is not a safer alternative to smoking and its cessation, thereby warranting similar regulations as those imposed on cigarettes.

AAPI-23-PO-029: Microalbuminuria and Albuminuria Prevalence and their Associated Risk Factors in a Type 2 Diabetic Population in Hyderabad, India

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Background: India has the second largest prevalence of type 2 diabetes mellitus in the world; as of 2015, an estimated 69.2 million people have the disease. In the surrounding region as a whole, 78.3 million people live with type 2 diabetes, with 52.1% undiagnosed. 44% of all cases of nephropathy are caused by type 2 diabetes mellitus.

Methods: There are two goals for this cross-sectional study: i) to measure the prevalence of microalbuminuria and albuminuria in type 2 diabetic patients and ii) to determine associated factors that elevate a diabetic's risk for kidney disease. We performed a urinalysis on each patient to measure urinary albumin and gave a modified WHO STEPS questionnaire to assess lifestyle risks.

Results: 100 patients were interviewed. 42 were normoalbuminuric, 46 were microalbuminuric, and 12 were albuminuric. Significant risk factors were being older than 44, having type 2 diabetes for longer than 6 years, alcohol consumption, and smoking.

Conclusion: The prevalence of microalbuminuria in type 2 diabetics is higher than previous studies. Primary prevention measures should be stressed in this population to prevent future onset of type 2 diabetes mellitus. Routine evaluation of serum creatinine will result in earlier detection and treatment of nephropathy. Future studies will investigate the impact of stress and monitor patients' serum creatinine, blood pressure, and lipid profiles.

AAPI-23-PO-029: The Impact of Sacroiliac Manual Therapy on Outcomes for Sacroiliac Joint Pain and Dysfunction: A Systematic Review with Meta-Analysis

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Introduction: Sacroiliac joint dysfunction (SIJD) is a common cause of lumbar and sacroiliac (SI) pain and disability frequently treated with non-surgical interventions. To date, no systematic review and meta-analysis has examined the impact of manual therapy on SIJD outcomes. The purpose of this study is to assess the effectiveness of manual therapy for SIJD.

Methods: A systematic review and meta-analysis with a random effects model was performed using PubMed, CINAHL, and MEDLINE on January 24th, 2023, with search terms ("Sacroiliac") AND ("manual therapy" OR "manipulation"). Inclusion criteria was SI joint involvement, use of manual therapy for SIJD, randomized controlled trials only, and outcomes related to pain (0-10 scale) and disability (Oswestry Disability Index).

Results: A total of 10 randomized controlled trials met final inclusion criteria out of 851 articles. Included patients (n=421) had an average age of 39.5 (7.5) years with an average follow-up of 7.3 (4.2) weeks. SI joint manual therapy with or without exercise had a significant improvement in pain ($p=0.027$) and function ($p=0.021$) as compared to standard conservative interventions. Patients receiving SI thrust manipulation with or without exercise had a significantly greater decrease in pain ($p=0.035$) compared to patients who received exercise without manual therapy.

Conclusion: SI specific manual therapy with or without exercise is an effective conservative treatment option for improving pain and disability as compared to exercise without manual therapy in adult patients with SIJD. SI thrust manipulation can result in significant improvement in pain in patients with SIJD.

AAPI-23-PO-030: Non-Aneurysmal Subarachnoid Haemorrhage in Takayasu Arteritis

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Takayasu Arteritis is a large and medium vessel vasculitis mainly affecting the aorta and its branches. The early stages of the disease pose a diagnostic challenge due to the absence of specific symptoms, but as the condition progresses, patients may present with more recognizable signs such as the absence of a pulse and a range of other cardiovascular and neurological manifestations, some of which can be fatal. One such manifestation, which this patient presented with, is subarachnoid hemorrhage (SAH). SAH typically occurs as a result of the rupture of aneurysmal dilatation of the cerebral arteries due to chronic inflammatory changes to the vessel wall. However, in some cases, it can also manifest spontaneously, as observed in this particular patient without any evidence of cerebral aneurysms. The underlying mechanism for this finding is poorly understood but can be attributed to the rupture of newly developed collateral blood vessels, which form as a compensatory response to chronic hypoperfusion caused by the abnormal narrowing of cranial arteries. The condition can be managed conservatively with corticosteroids, and worsening prevented with modern surgical interventions. In conclusion, it is important to reach the diagnosis of Takayasu Arteritis and initiate subsequent management at the earliest to prevent fatal outcomes. Also importantly, further research is required into understanding the pathophysiology behind the development of non-aneurysmal subarachnoid hemorrhage in Takayasu Arteritis which can aid in developing preventive and treatment options for the same.

AAPI-23-PO-031: Chronic Thrombo-Embollic Pulmonary Hypertension with Superimposed Infective Bronchitis: A Case Report

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Introduction: Chronic thromboembolic pulmonary hypertension (CTEPH) is caused by chronic blood clots obstructing pulmonary arteries, resulting in pulmonary hypertension. Its diagnosis can be challenging without clinical/radiological evidence of acute pulmonary emboli.

Case Presentation: A 58-year-old male presented with dyspnea, fever, and cough for a month. Echocardiography showed severe pulmonary artery hypertension, and CT Pulmonary Angiography (CTPA) revealed bilateral pulmonary arterial thromboembolism with infective bronchitis. A definitive diagnosis of chronic thromboembolic pulmonary hypertension and lower respiratory tract infection was recorded. The patient received nasal oxygenation, low molecular weight heparin, and other supportive treatment. The patient was discharged with home-based oxygen therapy. Medications on discharge included Rivaroxaban, lactulose, aspirin, atorvastatin, tadalafil, ipratropium, levosalbutamol nebulization solution, and budesonide and formoterol nebulization solution. Further follow-up was recommended for considering Pulmonary Endarterectomy.

Discussion: CTEPH commonly presents with nonspecific symptoms such as exertional dyspnea and decreased exercise tolerance. Physical examination may not reveal any notable findings initially. The gold standard for diagnosis is right cardiac catheterization with pulmonary angiography, but newer methods such as dual-energy CT, MRI, and OCT can also be used. CTPA was the diagnostic modality for this patient.

Conclusion: Early detection of CTEPH and a multidisciplinary team approach is essential to lower morbidity and mortality. Surgical thromboendarterectomy is the preferred treatment, while balloon angioplasty, medical therapy, and anticoagulation are other alternatives. Education and follow-up are necessary for

drug adherence, and interprofessional communication is crucial for improved outcomes.

AAPI-23-PO-032: Uterine Arteriovenous Malformation- An Obstetrician's Nightmare!

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CASE REPORT: A 29-year-old, gravida 2 parity 1 with no other comorbidities presented with an uneventful pregnancy, a full-term normal vaginal delivery, and normal placental delivery. She had developed immediate post-partum hemorrhage (PPH) for which uterotonic agents were given with good response. She was discharged on post-partum day 3 with no complaints. On post-partum day 24, she presented in the emergency department with profuse bleeding through the vagina. The uterus was well involuted, but blood clots were seen on the per speculum examination. After ruling out local causes, resuscitation with general measures was done. Urgent ultrasonography with Doppler (a very sensitive modality for diagnosis) revealed a cluster of dilated anechoic vascular channels with bidirectional low resistance and high confirming the rare diagnosis of right uterine arteriovenous malformation (AVM) [3].

METHOD: An emergency uterine artery embolization procedure was performed. A super-selective catheterization of the right uterine artery was done.

RESULT: A repeat color Doppler was done after 24 hours which showed no residual AVM. The patient was discharged after 48 hours.

DISCUSSION: A uterine AVM is one of the rarest causes of secondary PPH. Uterine artery embolization is a safe, minimally invasive, and effective uterus-sparing procedure to control obstetric hemorrhage [4]. Excellent results were obtained with no post-operative complications and an early discharge in 2 days.

AAPI-23-PO-033: Unusual Presentation of Concurrent Cutaneous Plasmablastic Lymphoma and Acute Myeloid Leukemia: A Case Report and a Comprehensive Review

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Introduction: Plasmablastic lymphoma (PBL) is a rare type of non-Hodgkin's lymphoma, primarily seen in patients with immunosuppression, particularly HIV. It resembles diffuse large B-cell lymphoma. Cutaneous PBL is a unique entity that presents as erythematous to violaceous papules or nodules.

Case Presentation: A 62-year-old male patient presented to the hospital with a chronic wound on his right lower leg that has been present for the past six years. The wound had recently become increasingly painful, and the patient reported the development of new red nodules around the old wound. Physical examination revealed a large, expansive ulcer with rolled pink-purple borders encompassing most of the right shin and calf. A biopsy of the new nodules on the wound showed evidence of plasmablastic lymphoma, a rare and aggressive form of non-Hodgkin's lymphoma, and a biopsy of the bone marrow showed evidence of acute myeloid leukemia. The patient was referred to an oncologist for further management.

Conclusion: This case highlights the importance of considering PBL in the differential diagnosis of cutaneous nodules or papules in immunocompromised patients. Further research is needed to understand the pathogenesis of PBL and develop more effective treatment strategies.

AAPI-23-PO-034: Diagnostic Efficacy of Combined 18F-FDG-PET/CT and MRI in Assessment of Bone Marrow Involvement in Lymphoma Patients: A Systematic Review and Meta-analysis.

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Purpose: Bone marrow infiltration (BMI) assessment is a crucial step for staging lymphoma patients. The current study analyzes the diagnostic ability of combined 18F-fluorodeoxyglucose-positron emission tomography/computed tomography (18F-FDG-PET/CT) and magnetic resonance imaging (MRI) in detecting bone marrow

involvement in lymphoma through a systematic review and meta-analysis.

Methods: We systematically searched PubMed for articles published between 2000-2022 providing data regarding the diagnostic value of 18F-FDG-PET/CT and MRI in BMI in lymphoma patients. We extracted data regarding true positive, true negative, false positive, and false negative to calculate the diagnostic accuracy. OpenMeta Analyst was used for analysis. $P < 0.05$ was considered to be significant.

Results: Data from 24 studies showed that 18F-FDG-PET/CT and MRI had a pooled sensitivity of 0.771 (95% CI=0.652-0.858) and 0.778 (95% CI=0.637-0.875), respectively; and a pooled specificity of 0.897 (95% CI=0.859-0.926) and 0.886 (95% CI=0.793-0.940), respectively in all the lymphoma patients. Among Hodgkin lymphoma (HL), 18F-FDG-PET/CT and MRI showed a pooled sensitivity of 0.903 (95% CI=0.847-0.940) and 0.846 (95% CI=0.468-0.972), respectively; and a pooled specificity of 0.878 (95% CI=0.820-0.919) and 0.806 (95% CI=0.472-0.951), respectively. Similarly, in Non-Hodgkin Lymphoma (NHL), 18F-FDG-PET/CT and MRI had a pooled sensitivity of 0.569 (95% CI=0.309-0.796) and 0.777 (95% CI=0.469-0.932), respectively; and a pooled specificity of 0.866 (95% CI=0.687-0.950) and 0.795 (95% CI=0.599-0.910), respectively.

Conclusion: Non-invasive tests showed significant diagnostic accuracy compared to invasive tests like bone marrow biopsy. MRI showed a higher sensitivity for detecting true positives, especially in HL patients, compared to 18F-FDG-PET/CT.

AAPI-23-PO-035: Epidemiology and Outcomes Associated with Deep Vein Thrombosis - A Cross-sectional Study

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Background: Deep vein thrombosis occurs when one or more thrombi form in the location of a deep vein in the body. Recent DVT prevalence and outcomes reported widely vary.

Aim: Our aim of the study is to identify the prevalence, trend, and outcomes of DVT in US hospitalization from 2016 to 2018.

Methods: Retrospective study using Agency for HCUP Nationwide Inpatient Sample data (2016-2018). ICD-10-CM codes were used to identify DVT hospitalisations. The prevalence trend was calculated with the Cochran-Armitage trend test. We extracted demographics and patient and hospital-level characteristics. Outcomes were analyzed using chi-square and unpaired t-test and survey. Logistic multivariate survey logistic regression analysis was performed to calculate adjusted odds ratio (aOR) and 95% confidence interval (95%CI) for these outcomes.

Results: From 2016-2018, 87,761,798 hospitalisations, 1,174,625 (1.34%) had DVT. The prevalence trend of DVT increased from 1.32% in January 2016 to 1.36% in December 2018 ($pTrend < 0.0001$). DVT patients were older (66 vs 58 years old), female (1.63% vs 1.13%), Black race (1.59% vs White 1.38% vs Hispanic 0.96%), higher median household income 76-100th percentile (1.45% vs 51-75th percentile 1.37%) and having Medicare 1.68% (vs Private 1.13% vs Other/no insurance 1.05% vs Medicaid 0.86%) ($p < .0001$). Common concurrent conditions prevalent with DVT were hypertension 65.09% (vs 55.59%), renal failure 36.13 (vs 24.26%), diabetes mellitus 28.75% (vs 26.79%) and hyperlipidemia 35.2% (vs 32.39%). The mean cost of hospitalisation for DVT was \$95,728 (\$42,481 higher than no-DVT patients at \$53,247), and the mean length of stay

was 8.13 days (3.44 days higher than no-DVT patients at 4.70). In univariate analysis, DVT hospitalisations had in-patient mortality (4.76% vs 2.18%, $p < .0001$), disability (70.09% vs 36.07%, $p < .0001$), discharge to non-home facilities (53.58% vs 33.74%, $p < .0001$), and risk of death on discharge (55.32% vs 27.23%, $p < .0001$) compared to patients with no-DVT. The regression model for DVT hospitalisations yielded in-patient mortality (aOR:1.04, 95%CI 1.02-1.06, $p < .0001$, c-value 0.80) and disability (aOR 2.4, 95% CI 2.38-2.42, $p < .0001$, c-value 0.81), discharge to non-home facilities (aOR 1.78, 95% CI 1.76-1.79, $p < .0001$, c-value 0.78), and risk of death on discharge (aOR 1.60, 95% CI 1.58-1.61, $p < .0001$, c-value 0.85) compared to patients with no-DVT, after adjusting for variables such as demographics.

Conclusion: Hospitalization with DVT has slowly and steadily increased. DVT-associated treatment costs and adverse outcomes are increased and may be decreased with the right preventive measures and management.

AAPI-23-PO-036: Ellis-van Creveld Syndrome with Severe B/L Genu Valgum

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Introduction: Ellis van Creveld (EVC) syndrome is an autosomal recessive skeletal dysplasia, which is characterized by short stature, retarded growth, polydactyly, and ectodermal and heart defects. The first case of EVC syndrome was reported by McIntosh in 1933, but Richard W.B. Ellis of Edinburgh and Simon van Creveld of Amsterdam in 1940, first described this condition and defined it as EVC syndrome. It is also known as chondroectodermal dysplasia and meso ectodermal dysplasia. Birth prevalence of EVC has been estimated to be 7 per 10,00,000 population. (1). Prenatal abnormalities may be early discovered, after the 18th gestation week; they include narrow thorax, marked shortening of the long bones, hexadactyly of hands and feet, and cardiac defect [2,3], leading to discussing the diagnosis of short rib-polydactyly syndromes (cf. below). Increased first-trimester fetal nuchal translucency thickness in association with ECV has been described at 13th week of gestation [3]. The genu valgum seen in this is one of the most severe angular deformities seen in any condition. Combination of primary

genetic based dysplasia of lateral plate of tibial plateau combined with severe soft tissue contractures that tether tibia into valgus deformities.

Case Presentation: A 6-year-old girl came to the OPD with bilateral valgus knee deformity which was progressively noticed from 3 years age. She had stunted growth. Clinical findings include bilateral Valgus Deformity of 45 degrees, Patella dislocated laterally, Knee Extension normal, Polydactyly and Conical Teeth. The typical genu valgus deformity consists of lateral subluxation or dislocation of the patella combined with severe contractures of the iliotibial band, vastus lateralis, lateral retinaculum, and joint capsule. The typical chondro-osseous deformity is a deep "saucer-like" depression of the lateral articular tibial plateau and severe valgus of the proximal shaft of the tibia. The surgical approach included two stage correction was done first right side followed by left side, Common peroneal nerve release was done Followed by Proximal tibia corrective osteotomy (Rab's)/after fibulectomy, 8-plate application and Fasciotomy /patellar balancing.

AAPI-23-PO-037: Metabolic Surgery, an Intervention for the Global Epidemic of Uncontrolled Diabetes: A Systematic Review of the Current Evidence and Future Directions

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Background: Diabetes Mellitus type 2 (DMT2) affects >455 million worldwide, causing significant morbidity

and mortality. The rationale for our review is to identify potential modifications in diabetes management, comparison of types of metabolic surgery (MS), and whether there is room for innovation, and identify directions for further research.

Methodology: We evaluated 37 studies for primary outcomes such as DMT2 remission and postoperative complications, allowing for unbiased comparisons; secondary outcomes included Body Mass Index (BMI), Hemoglobin A1c (HbA1C), end-organ complications, mortality rate, and improvement in quality of life. Patients with BMIs ranging from 25 to 40 kgm² were included.

Result: MS can reverse DMT2 per our unbiased examination with remission rates ranging from 11.2% to 100%. Perioperative deaths ranged from 0.03 to 0.2%. 14/37 studies stated that Roux-en-Y gastric bypass (RYGB) was superior, while 1/37 supported Single-anastomosis gastric bypass (SAGB), and 1/37 supported Biliopancreatic Diversion (BPD) as superior.

AAPI-23-PO-038: An Unusual Progression of Membranous Nephropathy - Case Report

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Membranous glomerulopathy is one of the commonest causes of nephrotic syndrome and chronic renal insufficiency in adults. Three possible mechanisms have been suggested in the pathogenesis of MN. The first one is the direct glomerular deposition of the immune complexes that have already formed in the blood circulation. Second, the circulating antibodies react with an antigen intrinsic to the glomeruli, which is not continuously distributed along the lamina propria adjacent to the podocytes, resulting in the formation of immune complexes directly in the glomeruli. The third possibility is that there is a reaction of circulating antibodies with an

antigen not intrinsic to the glomerulus but deposited there due to some kind of affinity for the glomerular basement membrane. Renal biopsy is the gold standard investigation for diagnosing the cause of nephrotic syndrome. The characteristic lesion on light microscopy, which was seen in our patient, is the diffusely thickened GBM and capillary walls throughout all the glomeruli without any significant hypercellularity. Some studies also suggest that an elevated titer of antibodies such as anti-PLA2R, as was in our case, is associated with a lower response to immunosuppressive therapy and a longer time to normal state [6]. Some patients like ours are not responsive to conservative treatment, and hence alternative approaches are sometimes required to prevent worsening outcomes. KDIGO guidelines (Kidney Disease Improving Global Outcomes) suggest that immunotherapy should be considered when patients have persistent proteinuria, declining kidney function, or severe symptoms [8]. Alternating alkylating agents plus intravenous pulse or oral corticosteroids have been shown to be effective in treating MN (Ponticelli regimen). A six-month cycle could potentially aid in returning the patient to complete normal [9]. Some recent studies have even demonstrated the effectiveness of rituximab for the treatment of MN. It is a monoclonal IgG1 antibody that has an effect on B-cell depletion by binding and inhibiting CD20. It is often used to treat lymphomas, ANCA-associated vasculitis, rheumatoid arthritis, and other autoimmune diseases like membranous nephropathy, which was the case in our report [10,11]. In our case, we preferred the initial immunosuppressive treatment with rituximab over corticosteroids and the cyclosporine regimen due to previous positive clinical experiences.

AAPI-23-PO-039: Unveiling the Imposter: Unraveling Anxiety as a Misdiagnosed Motor Symptom in Parkinson's Disease and Its Consequences on Medication Management

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Background: Parkinson's disease is the second most common neurodegenerative disorder, affecting millions of people worldwide. It is characterized by a progressive loss of dopamine-producing neurons in the brain, which leads to a variety of motor and non-motor symptoms.

Case Presentation: A 64-year-old Asian female presented to our clinic with a chief complaint of lack of sleep, loss of appetite, anxiety, depression, and suicidal ideation. She had been diagnosed with Parkinson's disease six years ago and was initially well-managed on medication. However, three years later, she began to experience a worsening of her tremors. She was subsequently started on a combination of levodopa/carbidopa (25mg/100mg) every 2 hours and extended-release levodopa/carbidopa (50mg/200mg) four times a day. On initial presentation, the patient's Mini-Mental State Examination (MMSE) score was 28, her Beck Depression Inventory (BDI-II) score was 27, and her Hamilton Anxiety Rating Scale (HAM-A) score was 30. She was diagnosed with depression with anxious distress. She started on gabapentin 2400mg daily, quetiapine 50mg daily, and clozapine 0.5mg daily. She has shown significant improvement with this treatment regimen.

Discussion: Parkinson's disease is a complex disease with a variety of motor and non-motor symptoms. Anxiety is a common non-motor symptom of Parkinson's disease, and it can often be misdiagnosed as a motor symptom. This can lead to the overuse of Parkinson's medications, which can have serious side effects.

The case presented here is a good example of how anxiety can be misdiagnosed as a motor symptom in Parkinson's disease. The patient's anxiety symptoms were initially attributed to her worsening tremors. However, after a thorough evaluation, it was determined that the patient was suffering from depression with anxious distress. Once the patient was properly diagnosed and treated, she showed significant improvement.

This case highlights the importance of recognizing and treating anxiety in Parkinson's disease. Anxiety can have a significant impact on the patient's quality of life, and it can also lead to the overuse of Parkinson's medications.

AAPI-23-PO-040: Immunostimulatory Nanobody-STING-Agonist Conjugates to Improve Immunotherapy.

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While immunotherapy has revolutionized cancer treatment, there are still instances of resistance to therapies like checkpoint blockade and CAR-T cell therapy. One proposed mechanism of decreased efficacy in malignancies such as neuroblastoma is the immunosuppressive tumor microenvironment. Cues from tumor cells and tumor stroma can downregulate the immune system thus rendering these therapies inadequate. To tackle this problem, we developed a stimulator of interferon genes (STING)-activating anti-albumin nanobody conjugates that stimulate an immune response to increase the efficacy of immunotherapies. Activation of the STING pathway correlates with immuno-activation and T cell infiltration in multiple tumor models. Albumin is a naturally occurring protein in the body that localizes to tumors while also increasing the circulation time of drugs that bind to it. Combining both findings, we synthesized an anti-albumin nanobody and conjugated a small molecule STING agonist using click chemistry to the protein. Upon confirming the stability and biocompatibility of this protein conjugate, we observed improved pharmacokinetic properties with increased half-life of 20-fold compared to the STING agonist administered alone in C57BL/6 mice. In vitro studies on A549D and THP1D (IFN- β reporter lines) cells showed increased expression of interferon-beta (IFN- β). Current in vitro studies are underway to determine the immune response to the protein conjugate in NB9464D and NXS2 neuroblastoma cells. Immediate future work includes developing a neuroblastoma mouse model to determine the in vivo efficacy of the conjugate system. Taken together, this data indicates potential to improve efficacy of already existing therapies.

AAPI-23-PO-041: Novel Aetiology of Avascular Necrosis: Factor VIII Excess

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Avascular necrosis (AVN) of bone is a debilitating condition that occurs as a consequence of interrupted blood supply to bone, which may eventually result in the death of bone cells. Hypercoagulable states can be an atraumatic cause of ON of bone. Inherited thrombophilia is a major cause of hypercoagulability and with this case report we want to

establish the association between avascular necrosis of bone and factor VIII excess.

AIM: To establish an association between Factor VIII excess and AVN of bone in order that early recognition of aetiology may be possible.

CASE REPORT: We present a case of a 44-year-old Caucasian male who was referred by his Orthopaedic provider to the office for evaluation of AVN of head of right femur. He complained of pain in the right groin area for the last 8 weeks, which was progressive in nature and aggravated on making certain movements at work. He then visited the referring orthopaedic surgeon and an MRI of right hip was done, which revealed a severe AVN of the right femoral head, which was initially intact, but collapsed eventually in a week, as seen on repeat MRI. Of note was that he had AVN in his right knee years ago and underwent a right total knee arthroplasty for the same. Since he developed AVN in two separate locations without any other obvious risk factors he was sent for evaluation by Haematology. Here, the general physical examination was unremarkable. Dorsalis pedis and posterior tibial pulses were palpable. Blood work was ordered to rule out hypercoagulation syndrome. His results showed elevated Factor VIII (252%), homocysteine (18.7 $\mu\text{mol/L}$) and D-dimer (0.76 $\mu\text{g/mL}$) which suggested hypercoagulability and posed an increased risk of thrombosis to him. He was started on Apixaban 2.5 mg twice a day and is currently awaiting hip surgery. Blood work conducted is listed below.

CONCLUSION: Limited literature is available on aetiology and pathogenesis of osteonecrosis due factor VIII excess. This patient had two events of AVN at two separate locations. Insufficient work up after the first event delayed the diagnosis and early intervention. This emphasizes the need to consider hematological evaluation for a patient with AVN to look for Factor VIII or other clotting factor abnormalities.

Call for Articles on AI and Medicine/Healthcare



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Medicine and Healthcare are facing an unprecedented transformation by AI (Artificial Intelligence). The transformation is going to be phenomenal and essentially change the way physicians and healthcare professionals have been practicing. They have both excitement and fears as they are not aware of what is going to change and how to adapt to the change. To address this issue and to match the theme of AAPI Global Healthcare Summit 2024, which is Future of Healthcare & Artificial Intelligence, JAAPI is inviting articles on all aspects of AI that relate to medicine and healthcare for publication in the Winter 2023 Edition. Prospective authors should submit their articles by October 15, 2023. All articles will be subject to peer review. Instructions for submitting articles can be found in this edition of JAAPI.



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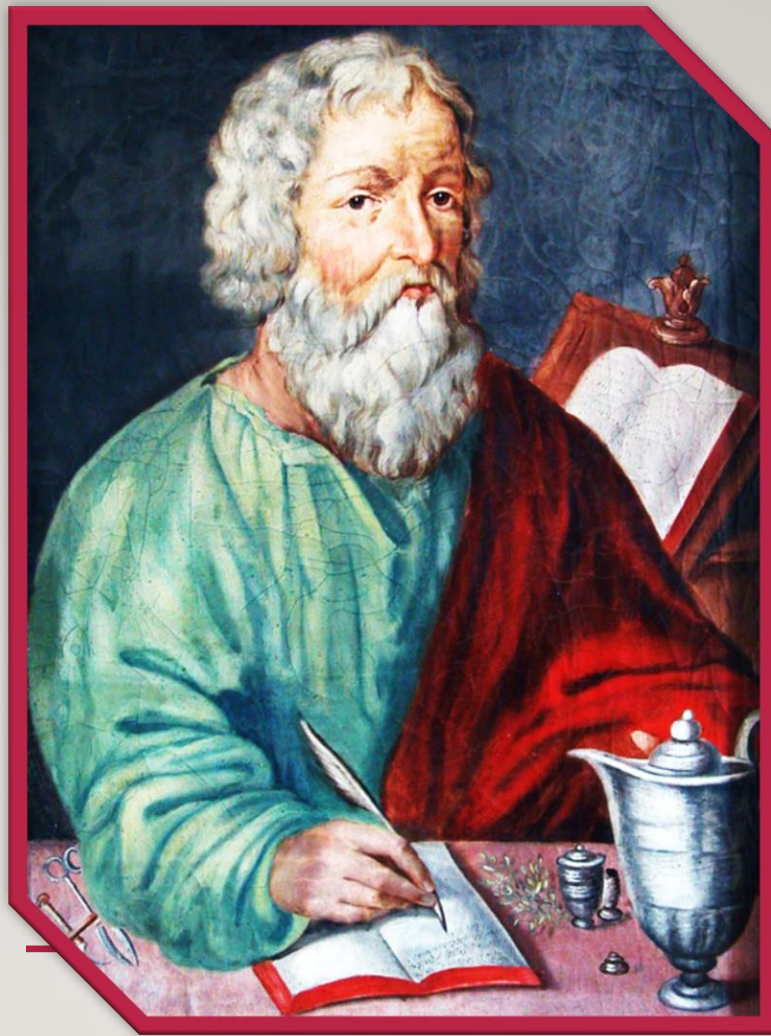


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REGISTRATION LINK COMING SOON



Portrait of Hippocrates (1787), by the
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**Science is the father of knowledge,
but opinion breeds ignorance.
- Hippocrates**