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Evolution of Peruvian gynecology up to the Bicentennial, and the future Evolución de la ginecología peruana hasta el Bicentenario, y el futuro

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ABSTRACT

A brief overview of the evolution of gynecology in Peru in the last 200 years is done. Following the medicine and surgery practiced by the inhabitants in the pre-Hispanic era, known through their *huacos* and archeological sites, and after the development of diagnostic and operative gynecology with the systematic use of the speculum in the 19th century, which made possible interventions such as uterine curettage and posterior colpotomy for the drainage of pelvic abscesses, the history of Peruvian gynecology would begin in 1878, when Lino Alarco performed the first gynecological surgery by laparotomy to remove an ovarian tumor. Néstor Corpancho, in his service at the Hospital de Santa Ana, was the first to perform myomectomies by laparotomy, as well as hysterectomies. In 1879, the Chair of Gynecology was created in the Faculty of Medicine of the Universidad Nacional Mayor de San Marcos, and later the first modern operating room was installed in Peru. In 1898, Constantino T. Carvallo initiated the training of brilliant gynecologists, which was later continued with the schooling of specialists and access to updated medical information. Current COVID-19 pandemic requires monitoring of women's short and long term health, their gestations and newborns' lives, greater investment in health, trained professionals in emergency and person-centered health, research on diseases and their prevention, learn more about genetics, immunology, metabolic syndrome and related comorbidities (obesity, hypertension, diabetes mellitus), how to prolong healthy life, use nanotechnology, artificial intelligence, robotics, and more.

Key words: Gynecology, History, Peru, Coronavirus infections, Public health policy.

RESUMEN

Se realiza una visión sucinta de la evolución de la ginecología en el Perú en los últimos 200 años. A continuación de la medicina y cirugía practicada por los habitantes en la era prehispánica, conocida por sus huacos y sitios arqueológicos, y después del desarrollo de la ginecología diagnóstica y operatoria con el uso sistemático del espéculo en el siglo XIX, que posibilitó intervenciones como el legrado uterino y la colpotomía posterior para el drenaje de abscesos pélvicos, la historia de la ginecología peruana se iniciaría en 1878, cuando Lino Alarco realizó la primera cirugía ginecológica por laparotomía, al extirpar un quiste tumoral de ovario. Néstor Corpancho, en su Servicio del Hospital de Santa Ana, fue el primero en realizar miomectomías por laparotomía, así como hysterectomías. En 1879 se creó la Cátedra de Ginecología en la Facultad de Medicina de la Universidad Nacional Mayor de San Marcos, instalándose posteriormente el primer quirófano moderno en el Perú. En 1898, Constantino T. Carvallo inició la formación de brillantes ginecólogos, continuada más adelante con la formación escolarizada de especialistas y acceso a la información médica actualizada. La actual pandemia COVID-19 requiere vigilar la salud de la mujer a corto y largo plazo, las gestaciones y vida de los recién nacidos, mayor inversión en salud, profesionales capacitados en emergencias y salud centrada en la persona, investigar sobre enfermedades y su prevención, conocer más sobre genética, inmunología, síndrome metabólico y comorbilidades relacionadas (obesidad, hipertensión, diabetes mellitus), cómo prolongar la vida saludable, utilizar la nanotecnología, inteligencia artificial, robótica, y más.

Palabras clave. Ginecología, Historia, Perú, Infecciones por coronavirus, Políticas de salud pública.

INTRODUCTION

We can learn part of the Peruvian pre-Hispanic history of health by observing the *huacos* -ceramic objects found in the *huacas*, tombs of the ancient Indians-, which in their shapes and drawings present diverse scenes of life, nature and customs of thousands of years ago. Human health and illnesses attracted the attention of ancient ceramists, who engraved representations of sexuality, pregnancy and childbirth, and various health problems. In addition, the finding of *tumis* (gold cer-



emonial cutting instruments used in cranial trepanations), obsidian knives, metallic clamps, bone needles, show us their advances in surgical procedures in soft tissue, the skull, face and extremities, malformations, tumors. They also used herbs, concoctions and rituals with supernatural concepts to cure diseases, as well as fertility rites and the cult of the dead⁽¹⁾. The stone engravings in the archaeological site of Sechin in Chimbote, Ancash, where there are lithic blocks decorated with reliefs of mutilated bodies and organs of the human body sculpted more than 4,000 years ago, are striking. Among them, we have found engravings of female organs.

Then came the experiences of Spaniards and Creoles with basic and life-saving cures and surgeries, both in Hispanic times and during independence, as Alvarez notes in an article in this issue. Later came the formalization of medical and surgical education with the appearance of the Royal College of Medicine and Surgery of San Fernando, in 1808. This occurred in parallel with the beginning of academic teaching in Mexico⁽²⁾ and Uruguay⁽³⁾, among other Latin American countries.

The proclamation of the independence of Peru by José de San Martín in the Main Square of Lima, on July 28, 1821, occurred after proclamations in other parts of the country, when half of the Peruvian territory was in the hands of the royalists and in the midst of a series of political, social and geological events that marked the destiny of our country. On December 9, 1824, the patriot victory in the battle of Ayacucho led to the Spanish capitulation and the end of their dominion in South America. Later, in 1854, during the government of Ramón Castilla, slavery was abolished. In 1868, off the coast of Tacna there was an earthquake of magnitude 8.8 on the Richter scale that left more than 25,000 dead.

Between 1879 and 1883 the war with Chile occurred, which meant a great economic and political disaster for the country. On October 5, 1885, Daniel A. Carrión, a medical student who experimentally inoculated himself with blood contaminated with *Bartonella bacilliformis* to contract the Peruvian wart, died; he is considered a "Martyr of Peruvian Medicine". Women voted for the first time in the 1956 general elections and, in 1962, Martín de Porres was canonized by Pope John XXIII, becoming the first black-skinned saint

in the Americas. In 1980, the so-called "Shining Path" began terrorist actions that left tens of thousands of Peruvians dead; its leader Abimael Guzmán was captured in 1992. In 2010, the novelist Mario Vargas Llosa received the Nobel Prize for Literature. And, on March 5, 2020, the first case of COVID-19 was detected in Peru, a disease that has so far caused around 200,000 deaths and among others, has revealed serious deficiencies in our health care system, in specialized human resources and in medical training.

We will briefly describe the evolution of gynecology in the country during the republican period, separating it into 3 periods.

PERIOD 1821-1875 - PRELIMINARY STAGE

In the 1820s, the use of Récamier's tubular metallic speculum for vaginal inspection became popular, which facilitated gynecological diagnosis. In 1845, Sims introduced a new speculum design in the form of a "duckbill" and, after multiple modifications, in 1941 the Graves speculum appeared, which is used today and is easy to introduce and maneuver. This allowed in the 19th century the advancement of diagnostic and operative gynecology, making it possible to perform interventions such as uterine curettage and posterior colpotomy for the drainage of pelvic abscesses⁽⁴⁾.

In 1846, the American dentist William Morton used the gaseous anesthetic ether for a painless tooth extraction, ushering in the anesthetic era of surgery. Subsequently, barbiturates and muscle relaxants appeared, as well as regional anesthesia.

In 1822, Sauter performed a vaginal hysterectomy, although there is a reference that the first vaginal hysterectomy was performed in 1726 by Robert Houston, in Glasgow.

PERIOD 1876-1950 - BIRTH AND DEVELOPMENT OF GYNECOLOGY IN PERU

Advances in general surgery and especially in gynecology were made in the last 25 years of the 19th century. Intraoperative surgery was practiced in Europe and North America by Koeberlé, Pean, Czerny, Billroth and others. After McDowell's pioneer ovariectomy in 1809, Koeberlé and Pran practiced ovariectomy in 1862



and 1864, respectively, an operation of very high risk, failures and high mortality. Progress of this type of surgery in Peru was slow because of the likelihood of peritonitis. However, the ovariectomy for tumor cyst performed by Lino Alarco Bedriñana at the patient's home, on June 12, 1878, was so successful that it became famous. In this first gynecological surgery by laparotomy, general anesthesia with chloroform was used, it lasted a little more than two and a half hours and drainage was left for the removal of the metallic loop that held the ovarian pedicle for several days⁽⁵⁾. The Supreme Government requested a report on this intervention from the Faculty of Medicine, in service to needy patients⁽⁶⁾.

In December 1895, the chair of gynecology was founded at the Faculty of Medicine of the Universidad Nacional Mayor de San Marcos, for which Dr. Téndulo Constantino Carvallo - appointed full professor of the chair by Supreme Decree of Nicolás de Piérola in June 1897 - built the Nuestra Señora de La Merced Ward at the Santa Ana Hospital, with 10 beds and the first modern operating room in Peru, thanks to the generous contribution of a full year of his salary as a professor. The inaugural class was given by Carvallo on August 17, 1898. In this small room, Carvallo revolutionized the hospital care of gynecological diseases and established a true teaching center, in which numerous gynecologists and surgeons were trained, such as David Matto, Mariano Alcedán, Pablo Mimbela, Eduardo Bello, Miguel Aljovín, among others. The general surgeon Guillermo Gastañeta also dominated all gynecological operations and was a factor in its progress⁽⁶⁾. Carvallo implanted in the hospital of Santa Ana and in the Maison de Santé Clinic the sterilization procedures and the practices of modern surgical asepsis advocated by Lister and Pasteur. He was also the first to use in Peru the Poupinel dry stove for sterilization, the rubber gloves of Halstead and Chaput and brought the first X-ray apparatus, with which, in 1896, he took the first plate from the hand of President Don Nicolás de Piérola and later from the writer Ricardo Palma. He was also a pioneer in the importation of radium for the treatment of cancer and a precursor in the use of radiotherapy in oncological treatment. He is justly considered the 'Father of Peruvian Gynecology'⁽⁷⁾.

In 1908, Bello reported his experience with total hysterectomy in 17 patients at the Santa Ana Hospital, three of whom died⁽⁷⁾. By 1929, abdominal hysterectomy became popular for benign pathologies of the uterus.

In the first decades of the 20th century, the old Hospital Real de Santa Ana gave rise to two large hospitals, one for obstetrics (La Maternidad de Lima) and the other for gynecology (Hospital Arzobispo Loayza), both staffed by eminent physicians. In 1924 the Arzobispo Loayza Hospital was inaugurated, and Dr. Constantino J. Carvallo Alzamora took charge of the gynecology service until his death in 1952. The first gynecologists of Ward 5 of Loayza Hospital, besides Carvallo, were Alfredo Curotto, Luis Esteves, César Heraud C., Lucas Molina Navia, Alberto Santos Astete and Marcelino Castellares, who were founding members of the Peruvian Society of Obstetrics and Gynecology, on June 30, 1947.

For many years, and well into the twentieth century, subtotal or supracervical hysterectomy would be described by Howard Kelly and used to reduce infectious morbidity by not opening the vagina.

The case of Lina Medina, the youngest known mother, who had her baby by cesarean section at the age of 5 years, 7 months and 21 days, on May 14, 1939, caused a sensation in the world. In addition to the obstetric uniqueness, it should be considered that her reproductive endocrine system unusually advanced her physiology by several years, with precocious puberty and first menstruation at 2 years and 8 months.

At that time, the most important hospitals in Peru were dedicated to women's health. The Hospital Arzobispo Loayza only had gynecological care and the Hospital Maternidad de Lima, obstetric care. Something similar occurred in Callao, with obstetric care at the Maternidad del Callao and gynecological care at the Hospital Guadalupe de la Beneficencia del Callao. European ideas still considered that women's illnesses, including pregnancy and childbirth, were "secrets" and should not be attended or witnessed by men, except in exceptional circumstances⁽³⁾.



PERIOD 1951-2021 - CONSOLIDATION AND ADVANCEMENT OF GYNECOLOGY IN PERU

In general terms, the mutilating gynecological surgery, with large incisions, massive mobilization of organs, forced drainage, many risks and multiple complications, gave way to the current surgery, safe and with sporadic complications. Ruiz-Velasco points out that the reasons for this improvement⁽⁸⁾ are that surgical diagnosis is earlier and giant tumors of the ovary or uterus are no longer seen, due to accessibility to health centers and better methods of detection and diagnosis (laboratory, ultrasound, tomography, magnetic resonance, among others). We will add the introduction of broad-spectrum antibiotics, minimally invasive surgical technology (laparoscopy, hysteroscopy), modern anesthetic procedures, adequate specialized preparation of surgeons, access to more scientific information and certification of surgical specialties and subspecialties.

There is no doubt that the school-based training of specialists in gynecology and obstetrics through the medical residency program, which the Universidad Nacional Mayor de San Marcos started with Dr. Abraham Ludmir in 1961 and soon spread throughout the country, contributed decisively to the development of the specialty in Peru.

The surgical management of pelvic floor pathology and stress urinary incontinence, although performed since the 19th century, acquired greater importance since the 1950s, due to better results and lower morbidity⁽⁹⁻¹¹⁾, the most commonly used techniques being vaginal hysterectomy with Kelly's antero-posterior plasty⁽¹²⁾, the Burch operation and the Marshall-Marchetti-Krantz technique. In the last 15 years, the use of meshes and tapes has been added^(13,14). We note that urogynecology is a subspecialty that has undergone great development.

In Peru, at the end of the 1970s, Victor Diaz, Luz Jefferson and Javier Bacini performed the first diagnostic laparoscopies and tubal blocks by laparoscopy at the Loayza Hospital⁽¹⁵⁾. Eduardo Maradiegue did the same at the Hospital Nacional Cayetano Heredia⁽¹⁶⁾. As technology improved with the appearance of the video camera and sophisticated instruments, the laparoscopic approach spread rapidly, allowing the diagnosis

and treatment of various gynecologic pathologies in public hospitals and private institutions since the 1990s⁽¹⁷⁻²⁰⁾. In 1995, Seminario published the first cases of hysterectomy assisted by laparoscopy⁽²¹⁾. Vaginal vault prolapse and stress urinary incontinence began to be surgically corrected laparoscopically⁽²²⁾.

In the 1990s, several private and public centers acquired the hysteroscope, initially diagnostic. Later, the Bettocchi hysteroscope and the resectoscope were used for the correction of intrauterine pathologies, such as polyps, myomas, synechiae, septa, foreign bodies⁽²³⁻²⁵⁾. These interventions are performed both in the operating room and in the office⁽²⁶⁾.

Cases of congenital vaginal agenesis were operated since 1970 in ward 5 of Hospital Loayza, using the Mc Indoe technique, with skin lining in the neovagina and transitional acrylic prostheses, which were later replaced by foam rubber⁽²⁷⁾. Other techniques have been used in the country for the lining of the neovagina. And for the first time in the region, in 2007 a laparoscopic-assisted neovagina creation using peritoneum was performed⁽²⁸⁾.

Regarding family planning, the first intrauterine device (IUD), the so-called Zipper ring made of nylon, was introduced in Peru in 1964. At the end of the 1960s, the Lippes loop began to be used, which was later replaced by the copper T, due to its greater safety and efficacy. It has also been used successfully in the postpartum period⁽²⁹⁾, and recently the IUD medicated with levonorgestrel was introduced, which is associated with lower menstrual volume⁽³⁰⁾. Combined oral contraceptives (COCs) arrived in Peru in the 1960s, but their use became popular in the 1980s. Since then, changes in doses and estrogenic and progestin components have increased the supply and safety of COCs, reducing side effects. In the 1990s, subdermal implants began to be used in the country⁽³¹⁾.

In 1977 the radiologist Elio Quirós Diaz introduced ultrasound in Peru. When the gray scale appeared, ultrasound had a great acceptance for clinical diagnosis in the specialty. In the 1980s, color Doppler appeared in two-dimensional imaging, and the transducers were improved, enhancing the quality of the images obtained. Three-dimensional imaging (3D) and



moving image (4D) came-forth later. Being a cheap, innocuous and reproducible procedure, ultrasound has become an indispensable tool for the diagnosis and management of obstetric and gynecological patients and in reproductive medicine⁽³²⁾.

The Peruvian Society of Obstetrics and Gynecology (SPOG) was founded 74 years ago, in 1947, with the mission of contributing to the development of science for the benefit of Peruvian women. In 1955, the first issue of the Peruvian Journal of Gynecology and Obstetrics (RPGO), the official organ of the Peruvian Society of Obstetrics and Gynecology, appeared under the name Gynecology and Obstetrics. In this issue, the president of SPOG and Editor of the RPGO, Dr. Lucas Molina Navia, included four gynecological articles: Some considerations regarding vulvar cancer, Carcinoma in situ of the cervix and pregnancy, Uterotubal persufflations, and 98.4% approximation in the diagnosis of uterine cancer by the Papanicolaou method in 482 selected patients. The publications in the RPGO allow us to know the evolution of this specialty in our environment. Up to 2017, 1,725 articles had been published, of which 350 referred to gynecological topics, 25.3% of the total⁽³³⁾. We gynecologists have learned more and more about gametes, fertilization, implantation, contraception, inflammation, cellular life, tissue renewal, apoptosis, climacteric and menopause, prolongation of life expectancy, physiology and reproductive medicine, infections, genital prolapse and urinary incontinence, gynecological and breast cancer, genetics, ultrasound, endoscopic surgery, in addition to topics related to pregnancy, childbirth, maternal and perinatal morbidity and mortality, at sea level and altitude. And members of the SPOG have created institutional chapters such as the Peruvian Societies of Fertility, Perinatology, Climacteric and Menopause, Ultrasound, Laparoscopic Surgery, Contraception, Fetal Medicine, among others⁽³⁴⁾. We have also learned to be careful in the use of medications, antibiotics, hormones, diagnostic and invasive procedures, when to stop at surgery. And we are applying molecular genetics, genomics, gene editing, epigenetics, immunology, while not neglecting the quality of health care focused on women, disease prevention, and learning about the application of artificial and robotic technology.

Having fleetingly traced the history of gynecology up to the present day, we wonder what will be the future of gynecology and medicine after this year of celebration of the Bicentennial of the Independence of Peru.

WHAT IS FORESEEN FOR THE FUTURE OF HEALTH-CARE SYSTEMS?

100 years ago, the average man had a life expectancy on only 47 years, antibiotics or vaccines and primary care had not been invented, 95% of all births occurred at home, and the leading causes of death were pneumonia, influenza, tuberculosis and diarrhea. Doctors had little education, including no college education⁽³⁵⁾. Current issues of our healthcare systems are insufficient care quality and patient safety, a misguided focus on acute care instead of preventing and maintaining population health, an inadequate person-centered approach, and unsustainable cost⁽³⁶⁾.

According to the 2020 Women's Health Survey conducted by the Kaiser Family Foundation, nearly one-third of US women in poor or fair health lacked health care during the COVID-19 pandemic, indicating the impact of the pandemic on women's access to health care and care delivery⁽³⁷⁾. In South American countries, national health systems, the number of physicians and health professionals, and care for the millions of people infected with the virus was generally improvised, incomplete, inconsistent, and non-uniform. The next decade will see major changes in healthcare and system design, driven by digital health, growing consumerism, and increasing financial constraints, all accelerated by COVID-19⁽³⁶⁾.

The length of stay for recovery from procedures is said to have decreased substantially due to technological advances that have also allowed for an increase in outpatient surgeries. Shorter hospital stays also benefit patients' health because they limit potential exposure to germs and possible medical errors, and physicians are more open about diagnosis and treatment for shared decision making and patient empowerment⁽³⁸⁾.

A blog author proposes the top last century medical technology advances that have contributed to the quality of care and better outcomes



of today: the electroencephalogram (1924), the negative pressure ventilator (1928), minimally Invasive surgery using a cystoscope to treat bladder lesions (1931), the pacemaker (1936), dialysis (1943), the disposable catheter (1944), cardiac defibrillation (1947), magnetic resonance (1952), the heart-lung bypass machine and the cochlear prosthesis (1953), fetal (Doppler) ultrasound (1958), the insulin pump (1963), the computerized tomography scanner (CT scan, 1971), the first successful implantation of an artificial heart (1982), robots and lasers (1987), the bionic limb (1993), the artificial knee (2004), and 3D-printed body parts (2013)⁽³⁹⁾. Other advances include nanotherapies, digital diagnostic tools, wireless monitoring devices, internet applications that can connect devices to a smart grid, and artificial intelligence (AI) that can help monitor patient conditions. The CT scan was just one development in a centuries-long quest to more precisely visualize lesions in the human body. A half-century later, the CT scanner has become part of the fabric of routine medical care⁽⁴⁰⁾.

The report by the European Federation of Pharmaceutical Industry Associations (EFPIA), under the title "Strengthening healthcare systems through smart spending", contains seven recommendations for the future: measure health outcomes in a standardized way and make data public; improve care coordination with the drive for digital health and data aggregation systems; promote cost efficiency; strengthen prevention, early detection and health intervention and health education; incentivize payment models for outcomes rather than volume; integrate budgets across the healthcare cycle; and share best practices⁽⁴¹⁾.

Telemedicine is the exchange of medical information from one location to another using electronic communication, including computers, smartphones, messaging, as an appropriate and efficient means of remote delivery of healthcare. Its use has increased worldwide with the COVID-19 pandemics, expanding accessibility and efficiency through reducing physician-patient contact, need to travel, hospital stay duration and readmissions, costs. Due to the closure of first level healthcare centers and decrease of human health personal due to age, comorbidities and viral infection, telemedicine has decreased the time to obtain a medical appointment in 80% in Peru⁽⁴²⁾. Telemedicine requires a good digital internet platform for real-time communication.

CHRONIC DISEASES OF WOMEN IN THE GYNECOLOGICAL PRACTICE

The major studies related to health and disease have been carried out in men more than in women, which makes it necessary to expand the studies dedicated to women, in order to be able to act specifically and with solvency on their health. However, there are new developments in the management of women's diseases and new technological horizons are being published in the most important medical journals in the world. Some of them are summarized in the following lines.

It is known that the case fatality rate is higher in men than in women, and it has been hypothesized that the estrogenic hormone is the main reason for the longer life expectancy of women. This relationship has also been found with susceptibility to severe acute respiratory syndrome from coronavirus 2, as the likelihood of severe infection and mortality from COVID-19 is lower in premenopausal women, but not in postmenopausal women⁽⁴³⁾. It is possible that down-regulation of protective ACE2 expression in elderly and pregnant patients may increase their risk of COVID-19. New evidence could refute the first assertion, as we will see below. It remains essential to defend the role of science as an avenue for improving health⁽⁴⁴⁾.

The Member States of the World Health Organization (WHO), recognizing the increasing burden of non-communicable diseases (NCDs), adopted a Political Declaration in this regard during the 65th World Health Assembly, in which they set a target of reducing premature mortality from cancer and important NCDs (cardiovascular diseases, chronic respiratory diseases and diabetes) by 25% by 2025. Acute lower respiratory infections and cerebrovascular diseases are the leading causes of death in men and women in Peru. In the case of women, the third leading cause of death is diabetes mellitus, followed by interstitial lung disease, ischemic heart disease, malignant neoplasm of the stomach, hypertensive diseases⁽⁴⁵⁾.

There have been advances in reproductive health and improvements in women's well-being throughout the life span, including reduction in cardiovascular disease (50%)⁽⁴⁶⁾ and cancer mortality. But, despite accounting for 35% of wom-



en's deaths each year, cardiovascular disease (CVD) remains under-studied, under-recognized, under-diagnosed and under-treated; and women are under-represented in clinical trials. CVD kill more women than men, and it is a misconception that women are less likely to develop CVD. Coronary artery disease (CAD) is a leading cause of CVD morbidity and mortality. In India, there has been an alarming increase in coronary events in women, as much as in men, probably due to higher incidence of risk factors for CAD. The false sense that estrogens protect women leads to less aggressive and delayed prevention or treatment strategies that contribute to female CAD. Metabolic syndrome (MetS) is a major contributor to the future development of CAD and early interventions for prevention should be implemented. Due to physical inactivity and central obesity, MetS is more prevalent in women, especially postmenopausal women. With estrogen loss, menopause marks a critical cardiovascular biological transition, with significantly increased CVD risk in women over 55 years of age⁽⁴⁷⁾.

The Lancet Women and Cardiovascular disease Commission tries to reduce the global burden of cardiovascular conditions by 2030, including heart disease and stroke. High blood pressure is the greatest risk factor contributing to years of lost life from cardiovascular disease in women, followed by high body mass index and high LDL cholesterol. While these well-established risk factors might affect women differently than men, there are sex-specific risk factors such as premature menopause and pregnancy related-disorders that must be more widely recognized and prioritized as part of treatment and prevention efforts worldwide⁽⁴⁸⁾.

17 experts from 11 countries have written the first global report on cardiovascular disease in women, outlining 10 new recommendations, including educating healthcare providers and patients on early detection to prevent heart disease in women, expanding heart health programs in highly populated and underdeveloped regions, and prioritizing specific research on heart disease in women and consequent intervention strategies⁽⁴⁹⁾. These recommendations should be known and advised by gynecologists to their patients, suggesting preventive measures such as adequate nutrition, permanent exercise, weight control, and referring women to specialists when necessary.

In the following paragraphs we present recent relevant studies on some gynecologic diseases whose current management would not necessarily be the correct one.

Endometriosis consists of ectopic implants of endometrial tissue that complicate women during their reproductive years. Endometriosis occurs in a high percentage of women without producing symptomatology, but is expressed with pelvic pain, infertility or deep invasion in a group of genetically predisposed women, whose immune response is aberrant⁽⁵⁰⁾. Many women with endometriosis require medical and surgical treatments that are not always well tolerated or successful, as well as assisted reproductive techniques for infertility. A Canadian study of 84,885 women aged 18 to 50 years who were followed for a median of 10 years has found that women who undergo surgery for endometriosis by diagnostic laparoscopy are significantly more likely to require further surgery within the first postoperative year, while women who undergo major conservative surgery are significantly less likely to require further surgery within the first postoperative year⁽⁵¹⁾. This reaffirms the knowledge that the results of surgery in endometriosis are unpredictable. We suggest that, according to the publications on the association of endometriosis with autoimmune diseases, it is necessary to deepen these studies and find treatments that correct the immunological alteration of endometriosis, medications that do not have impact on a woman's fertility⁽⁵²⁾.

Women with infertility also appear to face increased risks for severe maternal morbidity, cancer and chronic diseases. Between 2003 and 2019, a retrospective analysis compared 72,786 women with infertility with 3,845,790 women without infertility. In 16,473,458 person-years of follow-ups, 13,934 women died. Women with infertility had a 32% higher relative risk for death from any cause than women without infertility. Although the absolute risk for death was low in both groups, women with infertility faced a higher relative risk for mortality than women without infertility⁽⁵³⁾. It is known that pregnancies resulting from infertility treatments are associated with pregnancy complications, such as the risk of multiple births, preeclampsia, premature delivery and cesarean sections. However, there are few studies observing the long-term evolution of women treated for infertility. The results of the



aforementioned communication should encourage gynecologists to discuss with the woman with fertility problems the relationship between infertility and the possibility of developing diseases later in life, recommending continued medical follow-up.

Stress incontinence is common among women, but underdiagnosed. It is estimated that about 50% of adult women suffer from urinary incontinence, and only 25 to 61 percent of symptomatic women seek medical care⁽⁵⁴⁾. Screening can be easily achieved by asking women if they have urinary leakage with coughing, laughing, sneezing, or exercise. Effective initial interventions include weight loss in overweight or obese women and pelvic-floor muscle Kegel exercises. Other options include pessaries or surgery (most commonly midurethral mesh sling surgery) for women with bothersome symptoms not responsive to other interventions⁽⁵⁵⁾. There are successful experiences of about 95% in the surgical treatment of stress urinary incontinence in Peru, in patients evaluated 5 to 10 years later⁽⁵⁶⁾. Now, ACOG reports that urinary incontinence in women can harm their mental health. Researchers analyzed data from 10,000 adult women who participated in a Portuguese Health Ministry survey conducted every five years. Those who reported incontinence were 66% more likely than others to have been diagnosed with depression, and they also visited their doctor more often for mental health reasons⁽⁵⁷⁾. Thus, the importance of gynecologic evaluation of women for stress urinary incontinence, which can occur as early as adolescence and increase with age through menopause, when modifiable factors such as anxiety, weight gain, and diabetes may be associated with the development of more frequent incontinence^(58,59).

All women undergo the menopause transition (MT), a neuro-endocrinological process that impacts aging trajectories of multiple organ systems including brain. The multi-modality neuroimaging study indicates substantial differences in brain structure, connectivity, and energy metabolism across MT stages, specific to menopausal endocrine aging rather than chronological aging. Brain biomarkers largely stabilized post-menopause, and gray matter volume (GMV) recovered in key brain regions for cognitive aging. GMV recovery and in vivo brain mitochondria ATP production correlated with preservation of cogni-

tive performance post-menopause, suggesting adaptive compensatory processes. In parallel, amyloid- β deposition was more pronounced in peri-menopausal and post-menopausal women carrying apolipoprotein E-4 (APOE-4) genotype, the major genetic risk factor for late-onset Alzheimer's disease. These data show that human menopause is a dynamic neurological transition that significantly impacts brain structure, connectivity, and metabolic profile during midlife endocrine aging of the female brain⁽⁶⁰⁾. In another long-term population-based study, longer reproductive lifespan in women appears to be associated with increased levels of amyloid-beta 42, total tau (t-tau) and amyloid-beta 42/40 ratio, cerebrospinal fluid biomarkers during the pre-clinical phase of Alzheimer's disease. Findings suggest that longer exposure to endogenous estrogen may be associated with increased levels of AD biomarkers in the preclinical phase of AD⁽⁶¹⁾.

Thus, brain and neurological modifications in women in the menopausal transition are influenced by endocrine aging. However, biomarker studies indicate that biochemical and cellular recovery activities occur, which will be better understood in the future.

CANCER IN WOMEN

ACOG, in collaboration with the Society of Academic Specialists in Obstetrics and General Gynecology, has conducted a rigorous analysis to identify key areas of women's health that have undergone notable changes. These include breast and cervical cancer screening⁽⁶²⁾. However, according to the Pan American Health Organization, 45% of cancer deaths worldwide occur in the Americas region where the number of deaths will increase from 1.2 million in 2008 to 2.1 million in 2030 due to the effect of population aging and changing lifestyles (consumption of tobacco, alcohol, unhealthy diet, physical inactivity)⁽⁶³⁾.

Carriers of genetic mutations diagnosed with ovarian cancer use fewer oral contraceptives (ever use: 58.6% for BRCA1 and 53.5% BRCA2) than unaffected carriers (ever use: 88.9% for BRCA1 and 80.7% for BRCA2). The median duration of use was 7 years for BRCA1 and BRCA2 carriers who developed ovarian cancer and 9 and 8 years for unaffected BRCA1 and BRCA2



carriers with ovarian cancer, respectively. For BRCA1 mutation carriers, longer duration of oral contraceptive use has been associated with greater reduction in the risk of ovarian cancer, and protection is long-term⁽⁶⁴⁾.

In their daily practice, gynecologists should consider asking questions related to breast, cervical, ovarian cancer to their patients, so as to decrease early deaths. And interventions are needed to ensure that cancer treatment practices are equitable for all people, regardless of ethnicity or socioeconomic background⁽⁶⁵⁾.

WOMEN CENTERED MEDICINE

For the past few years, patient-centered care has been an intense focus of health care leaders as well as a byword for excellence in care delivery⁽⁶⁶⁾. One of the innovations takes women into account, and women-centered care is now considered as part of women's health care⁽⁶⁷⁾. Yet patients still have little influence in matters that impact them the most. In the eBook, *The Power of the Patient Voice*, how leading health care organizations have given patients a more prominent voice is examined, so they can take greater responsibility and be more accountable for their own care. Using data gathered by the NEJM Catalyst Insights Council surveys and one-on-one interviews with Insights Council members, they analyze several aspects, including how their organizations are moving away from fee-for-service models to empower the patient voice; integrating social determinants of health and patient values into care plans; improving collaboration, including care team documentation, to carry the patient voice through the continuum of care; adapting health care access to align with patient needs; and updating medical training to include the importance of patient empowerment⁽⁶⁸⁾.

The pandemic has also made visible the vulnerability of women to family violence and an increase in femicides, and labor violence, with loss of jobs. This impacts women's health, hindering their cognitive, emotional and social skills⁽⁶⁹⁾. Among the recommendations Well-Woman Care – A Well-Woman Chart was developed by the Women's Preventive Services Initiative (WPSI) that provides a framework for incorporating preventive health services for women into clinical practice⁽⁷⁰⁾. In this regard, Peru's leading medical schools have begun the process of incorporating

the concept of person-centered medicine into their curricula, including the issue of violence against women and femicide, which increased during the COVID-19 pandemic⁽⁷¹⁾.

At a time when the SARS-CoV-2 virus is reproducing again in Europe and the United States of North America in a probable third infectious wave, Peru has the highest number of deaths due to COVID-19 in the world in relation to the size of its population. The pregnant woman suffers a more severe disease due to the virus, sometimes with a process similar to preeclampsia, and greater fetal death, prematurity and maternal mortality in Peru. Vaccination is administered in pregnant women without major side effects, but the duration of immunity given by COVID-19 infection and by the vaccine is not known. It is also not known whether the viral infection will leave sequelae that affect their health, reproductive life and offspring.

THE FUTURE IS CLOSER

Between 1999 and 2018, the population-based LIFE Child and the obesity-enriched Leipzig Obesity Childhood cohorts recruited 8,629 children and performed 37,493 comparative measurements of height, growth, and endocrine parameters in normal-weight and children with obesity (0–20 years). Children with obesity were significantly taller than normal-weight peers, differing at maximum by 7.6 cm (1.4 height, standard deviation scores) at age 6–8 years. Already at birth, children with obesity were slightly taller and thereafter had increased growth velocities by up to 1.2 cm/year. This growth acceleration was accompanied by increased levels of insulin-like growth factor-1 (IGF-1), insulin and leptin. Early emergence before other profound comorbidities implies predisposition, environmental, and/or endocrine factors affecting growth in early life. Height reference values for children with obesity may enhance the precision of clinical health surveillance⁽⁷²⁾. These parameters should be considered from childhood in women to determine their predisposition to obesity and related morbidities.

For prospective cohorts in Finland, Germany, Sweden, and the U.S., 24,662 children at increased genetic risk for development of islet autoantibodies and type 1 diabetes have been followed. The rate of progression to diabetes was inversely related to age at development of mul-



multiple autoantibodies, ranging from 20% per year to 6% per year in children developing multipositivity in ≤ 2 years or >7.4 years, respectively. In conclusion, the number of islet autoantibodies at seroconversion reliably predicts 15-year type 1 diabetes risk. In children retaining a single autoantibody, HLA-DR-DQ genotypes can further refine risk of progression⁽⁷³⁾.

Knowing that the main cause of death in Peruvian women is breast cancer, young Peruvians have a project in data science that uses online artificial technology analysis to measure the risk of developing cancer in the population. The so-called preventimeter (*prevenciómetro*, in Spanish) takes into account certain habits, age, place of residence, type of activity performed and others. With this information, the test emits the type of risk that a person has of developing cancer and suggests preventive recommendations for medical check-ups⁽⁷⁴⁾.

In the first issue of the magazine, I+D+i Perú of the National Council of Science, Technology and Innovation (Concytec), some of the advances in innovation and development (R&D) in the country are exemplified in relation to the social demand during the pandemic situation. Specialists in robotics, artificial intelligence, telehealth, medical electronics, biochemistry, genetics, electromechanics, medical digital imaging, biostatistics or pharmacology, from the Department of Electronic Engineering and Mechatronics of the Peruvian University of Engineering and Technology (UTEC), are materializing research and development projects. These include a surgical robot for high-precision surgical interventions, the adaptation of CRISPR-Cas technology for the early and effective detection of endemic diseases such as uta and the SARS-CoV-2 virus, textiles and leathers with antimicrobial, antifungal and virucidal properties, protection against ultraviolet rays thanks to the use of copper oxide and zinc oxide nanoparticles, design of an active drainage system for the treatment of glaucoma by reducing intraocular pressure and optic nerve damage, design of a soft hand prosthesis using soft robotics technology, production of a cereal that combines Andean grains with giant squid to combat anemia and malnutrition in children, the only one of its kind in the world. The materialization of these projects will mean a valuable contribution for the population and for our activity in medicine and surgery, in our case, in women's care⁽⁷⁵⁾.

The best-known surgical robot in the world is the Da Vinci, created more than a decade ago in the United States and with around 3,000 units in clinics and hospitals in various countries. Its price ranges between US\$ 1 and US\$ 2.5 million. The Peruvian project aims to create a robotic system to be used as the main tool in cutting surgeries, with a control interface to perform movements at different angles and various types of cuts. Three ultra-definition cameras (RGB 3D) and a surgical light have been integrated into the robotic station, allowing the teleoperation to be sharply focused, using a haptic device so that the surgeon can remotely feel the stiffness of the intervened tissue. It will be the first robot for high precision surgeries in Peru, requiring a good broadband internet connection, but with cost benefits, reduction of unintentional errors of health professionals in operating rooms due to long hours of surgical interventions, remote teleoperation and shortening of hospital stay⁽⁷⁵⁾.

Finally, this is the current demographic dynamics in Peru. By 2021, women will account for 50.4% of the Peruvian population. The total fertility rate (TFR) has decreased from 6.9 in 1950 to 1.9 children per woman in 2020. The population aged 80 years and older continues to increase in volume, and the population over 60 years of age has increased from 6.4% in 1940 to 13.0% in 2021. Between 1986 and 2020, the percentage of adolescent females aged 15 to 19 who have ever been pregnant declined to 8.3%. The crude birth rate of 49 births per 1,000 population in 1950 decreased to 17.6 in 2019, and the crude death rate decreased from 22.1 to 5.8 deaths per 1,000 population in 2019. Between 1950 and 2021, the average number of children born to Peruvian women fell from 7.0 to 2.2, and infant deaths fell from 159.5 to 12.5 per 1,000 births, while life expectancy at birth increased from 43.8 to 77.0 years. It is expected that, in 2050, life expectancy at birth will reach 80.1 years and that the average number of children per woman will be 1.7, i.e., it will continue to be below the replacement rate (2.1 children per woman)⁽⁷⁶⁾.

We observe that the medical and gynecological world after the Bicentennial of the Peruvian Independence will be different and astonishing. Molecular genetics, gene editing, epigenetics, nanotechnology, immunology, digitalization, flow charts, advanced technology, artificial intelligence, robotics and others will be in com-



mon use and will facilitate and may be offered to women for the preservation of their health, their physical and mental well-being and early detection and management of diseases. Much of this will depend on national political, economic and social evolution, control of pandemics and epidemics, better education from childhood, strengthening of the family, evolution of medical education and the institution of the concept of person-centered medicine and health.

REFERENCES

- Cabieses F. Amor y vida en la época precolombina. En: Pacheco J. Ginecología, Obstetricia y Reproducción. Tomo I. 2ª edición. Lima, Perú: REP SAC. 2007:11-5.
- Velásquez Uriarte J. Algunos apuntes para la historia de la ginecología en México. *Ginecol Obstet Mex*. 2008;76(11):695-9.
- Pou-Ferrari R, Pons JE. Historia de la ginecología y la obstetricia en el Uruguay. *Arch Ginecol Obstet*. N° especial 50 aniversario. Agosto 2012;50(1)11-98.
- Graña A. Consideraciones históricas sobre la evolución de la ginecología. *Rev Peru Ginec Obstet*. 2001;47(4):238-49.
- Graña A. El Dr. Lino Alarco y su época. *Acta Med Peruana*. 2008;25(3):187-9.
- Molina Navia L. Historia de la Obstetricia y Ginecología en el Perú. *Rev Peru Ginec Obstet*. 1968;14(3):407-19.
- Bazul Nicho V. Obstetricia y Ginecología. En: Salaverry O (editor). Historia de la Medicina Peruana en el siglo XX, tomo I. 1ª ed. Lima: Fondo Editorial UNMSM. 2000: 603-47.
- Ruiz-Velazco V. Evolución de la cirugía ginecológica en 50 años de ejercicio profesional. *Cirugía y Cirujanos*. 2003;71:479-89.
- Arenas N, Foix A. Importancia de la cisto-uretrografía en el tratamiento de la incontinencia de orina de esfuerzo. *Rev Peru Ginec Obstet*. 1957;3(4):211-9.
- Esteves L. Problemas urológicos en la cirugía ginecológica. *Rev Peru Ginecol Obstet*. 1959;5(4):274-91.
- Bedoya Hevia M. Tratamiento quirúrgico de la incontinencia urinaria de esfuerzo en la mujer, método de Kennedy. *Rev Peru Ginec Obstet*. 1961;7(2-4):66-70.
- Tregear H. La histerectomía vaginal en la cura del prolapso vaginal, nuestra experiencia. *Rev Peru Ginec Obstet*. 1975;21(1-3):189-96.
- Paredes J, Grande J, Saona P. Monoprótesis de polipropileno para corrección del prolapso vaginal anterior con o sin incontinencia urinaria. *Rev Per Ginec Obstet*. 2010;56(3):214-9.
- Bendezú A. Uso de la cinta transobturadora (TOT) para el tratamiento de la incontinencia urinaria de esfuerzo. Experiencia con los 40 primeros casos. *Rev Peru Ginec Obstet*. 2013;59(1):27-31.
- Bacini J, Siu A, Jefferson L, Diaz V, Muñoz C. Endoscopia ginecológica, laparoscopia clínica. *Rev Peru Ginec Obstet*. 1981;26(1):231-4.
- Maradiegue E. Endoscopia ginecológica, Bloqueo tubárico translaparoscópico. *Rev Peru Ginec Obstet*. 1981;26(1):234-6.
- Siu A. Laparoscopia en la enfermedad inflamatoria aguda y crónica. *Rev Peru Ginec Obstet*. 2009;55(1):13-6.
- Flint E. Miomectomía por laparoscopia. *Rev Peru Ginec Obstet*. 2009;55(1):21-5.
- Rechkemmer A. Laparoscopia en endometriosis. *Rev Peru Ginec Obstet*. 2009;55(1):17-20.
- Celis A. Rol de la laparoscopia en la evaluación por infertilidad. *Rev Peru Ginec Obstet*. 2009;55(1):26-32.
- Seminario, J. Histerectomía vaginal asistida por laparoscopia: informe preliminar sobre 12 casos. *Rev Peru Ginec Obstet*. 1995;41(1):38-9.
- Ávila C, Gurreonero E, Huamán R, Gonzales I. Evaluación a dos años de la promontofijación laparoscópica con anclaje de titanio del prolapso de la cúpula vaginal. *Rev Peru Ginec Obstet*. 2011;57(4):267-71.
- Ávila J, Cornejo B, Gallegos S. Valor de la histeroscopia diagnóstica, Hospital Nacional Sur Este EsSalud. *Rev Peru Ginec Obstet*. 2003;49(1):39-44.
- Vergara C, Ascenzo Battistini A, Ascenzo Palacio A. Histeroscopia en pacientes con esterilidad. *Rev Peru Ginec Obstet*. 1996;42(1):42-3.
- Seminario J. Histeroscopia operatoria: miomectomía. *Rev Peru Ginec Obstet*. 1996;42(1):39-41.
- Mahmud A, Clark J, Connor M. An introduction to hysteroscopy. In: Connor M y Clark TJ (editors). *Diagnostic and Operative Hysteroscopy*. 1a ed. United Kingdom: Ed Cambridge University Press. 2020:1-5.
- Alcántara R, Diaz Huamán V. Agenesia vaginal en el Hospital Arzobispo Loayza, Lima, Perú. *Rev Peru Ginec Obstet*. 1989;35(7):10-3.
- Rechkemmer A. Creación laparoscópica de neovagina según técnica de Davydov modificado, en pacientes con síndrome de Rokitanski. *Rev Med Hered*. 2021;32:33-6.
- Guzmán A, Ferrando D, Lagos G. Inserción del DIU post parto en el Perú: experiencia en 9 hospitales. *Rev Peru Ginec Obstet*. 1996;42(1):16-21.
- Velásquez Uriarte J. Algunos apuntes para la historia de la ginecología en México. *Ginecol Obstet Mex*. 2008;76(11):695-9.
- Mauricio J, Núñez J, Maradiegue E. Experiencia con el implante de levonorgestrel en el Hospital Nacional Cayetano Heredia. *Rev Peru Ginec Obstet*. 1995;41(1):45-7.
- Águila M, Esquivel L, Rodríguez C. Historia y desarrollo del ultrasonido en la imagenología. *Acta Médica del Centro*. 2019;13(4):601-15.
- Cabrera Ramos S. Ginecología: aporte de 70 años de vida institucional de la Sociedad Peruana de Obstetricia y Ginecología. *Rev Peru Ginecol Obstet*. 2017;63(3):347-65.
- Pacheco-Romero J. Contribución de la Sociedad Peruana de Obstetricia y Ginecología a la especialidad del país a sus 70 años de creación, valuada a través de las páginas de la Revista Peruana de Ginecología y Obstetricia. *Rev Peru Ginecol Obstet*. 2017;63(3):333-45.



35. 100 years ago in primary care. Annapolis Primary Care, Blog. Dec 28, 2015. <https://evolvedmedicalclinics.com/100-years-ago-in-primary-care/>
36. Zimlichman E, Nicklin W, Aggarwal R, Bates DW. Health Care 2030: The Coming Transformation. *MEJM Catalyst Innovations in Care Delivery*. March 3, 2021. <https://catalyst.nejm.org/doi/full/10.1056/CAT.20.0569>
37. Fyfe S. US Women's sexual and reproductive health trends. *Contemporary OB/GYN Journal*. 18 May 2021;66(6).
38. Leonard K. Hospital of yesterday. The biggest changes in health care during the past century. July 15, 2014. *USNews Health*. <https://health.usnews.com/health-news/hospital-of-tomorrow/articles/2014/07/15/hospital-of-yesterday-the-biggest-changes-in-health-care>
39. Wilson B. Principales avances en tecnología médica de los últimos 100 años. Blog de Carevoyance. 26 octubre, 2018. <https://www.carevoyance.com/blog/medical-technology-advances-100-years>
40. Howell JD. The CT Scan after 50 years - Continuity and change. *New Engl J Med*. 3 July 2021. DOI: 10.1056/NEJMp2033374
41. EFPIA. Strengthening health systems through smart spending. <https://efpia.eu/media/554822/strengthening-health-systems-through-smart-spending.pdf>
42. Ciriaco M. Menos tiempo de espera. *Diario El Comercio*. Martes 6 de julio de 2021.
43. Garg R, Agrawal P, Gautam A, Pursnani N, Agarwal M, Agarwal A, Parihar A, Pandey A. COVID-19 outcomes in postmenopausal and perimenopausal females: is estrogen hormone attributing to gender differences? *J Midlife Health*. 2020 Oct-Dec;11(4):250-6. doi: 10.4103/jmh.jmh_287_20. Epub 2021 Jan 21.
44. Stuenkel CA, Manson JAE. Women's Health — Traversing Medicine and Public Policy. *N Engl J Med* 2021 June 3;384:2073-6. DOI: 10.1056/NEJMp2105292
45. Editor. Minsa: sepa cuáles son las principales causas de muerte en el Perú. *Diario Médico*. 6 diciembre 2018. <https://www.diariomedico.pe/?p=12643>
46. Gibbons GH, Seidman CE, Topol EJ. Conquering atherosclerotic cardiovascular disease-50 years of progress. *New Engl J Med*. February 27, 2021. DOI: 10.1056/NEJMp2033115
47. Desai S, Munshi A, Munshi D. Gender bias in cardiovascular disease prevention, detection, and management, with specific reference to coronary artery disease. *J Midlife Health*. Jan-Mar 2021;12(1):8-15. doi: 10.4103/jmh.jmh_31_21
48. The Lancet. Experts call for urgent action to reduce global burden of cardiovascular disease in women by 2030. *EurekAlert News Release*. 26 May, 2021. https://www.eurekalert.org/pub_releases/2021-05/tl-tle051421.php
49. Vogel B, Acevedo M, Appelman Y, Bairey Merz CN, Chieffo A, Figtree GA, et al. THE LANCET COMMISSIONS. The Lancet women and cardiovascular disease Commission: reducing the global burden by 2030. *The Lancet*. May 16, 2021;397:10292.
50. Caserta D, Mallozzi M, Pulcinelli FM, Mossa B, Moscarini M. Enfermedad alérgica o autoinmune de la endometriosis: aspectos patogénicos - un estudio de control de casos. *Clin Exp Obstet. Gynecol*. 2016;43:355-7. PMID: 27328490
51. Bougie O, McClintock C, Pudwell J, et al. Long-term follow-up of endometriosis surgery in Ontario: a population-based cohort study. *Am J Obstet Gynecol*. Published online April 21, 2021. doi:10.1016/j.ajog.2021.04.237
52. Symons LK, Miller JE, Kay VR, Marks RM, Liblik K, Koti M, Tayade C. The immunopathophysiology of endometriosis. *Trends Mol Med*. Published: 24 July 2018. DOI:<https://doi.org/10.1016/j.molmed.2018.07.004>
53. Murugappan G, Li S, Alvero RJ, Luke B, Eisenberg ML. Association between infertility and all-cause mortality: analysis of US claims data. *Am J Obstet Gynecol*. July 2021;225(1):57.e1-57.e11. <https://doi.org/10.1016/j.ajog.2021.02.010>
54. Lucacz ES, Brubacker L, Schmader KE. Evaluación de mujeres con incontinencia urinaria. *UpToDate*. 21 de mayo de 2021.
55. Wu JM. Stress incontinence in women. *N Engl J Med*. 24 June 2021;384:2428-36. DOI: 10.1056/NEJMcp1914037
56. Pacheco J. Experiencia con la técnica de suspensión subperióstica del ángulo uretrovesical para el reparo quirúrgico por vía vaginal de la incontinencia urinaria de esfuerzo. *Ginecol Obstet (Perú)* 1993;39:50-7.
57. ACOG Today's Headlines. Urinary incontinence tied to worse mental health outcomes in women, research shows. *Bulletin Healthcare*. July 9, 2021.
58. Waetjen LE, Ye J, Feng WY, Johnson WO, Greendale GA, Sampselle CM, et al. Association between menopausal transition stages and developing urinary incontinence. *Obstet Gynecol*. 2009;114(5):989-98. doi:10.1097/AOG.0b013e3181bb531a
59. Kołodyńska G, Zalewski M, Rożek-Piechura K. Urinary incontinence in postmenopausal women - causes, symptoms, treatment. *Prz Menopauzalny*. 2019;18(1):46-50. doi:10.5114/pm.2019.84157
60. Mosconi L, Berti V, Dyke J, Schelbaum E, Jett S, Loughlin L, et al. Menopause impacts human brain structure, connectivity, energy metabolism, and amyloid-beta deposition. *Sci Rep*. 2021;(11):10867. <https://doi.org/10.1038/s41598-021-90084-y>
61. Najjar J, Hällström T, Zettergren A, Johansson L, Joas E, Fässberg MM, et al. Reproductive period and preclinical cerebrospinal fluid markers for Alzheimer disease, Menopause: July 02, 2021. Publish ahead of print. doi: 10.1097/GME.0000000000001816
62. Hennessy M Sr. What's new in women's health? Chairman's letter. *OBGYN0621_003_ChairLetter.indd Contemporary OB/GYN J*. 2021, June 1;66(6).
63. Perú Ministerio de Salud Programa presupuestal 0024 Prevención y control del cáncer. Directiva N° 002-2016-EF/50.01. 2021. https://www.minsa.gob.pe/presupuestales/doc2021/ANEXO2_6.pdf
64. Schrijver LH, Antoniou AC, Olsson H, Andneu N, Rookus MA. Oral contraceptive use and ovarian cancer risk for BRCA1/2 mutation carriers: an international cohort study. *AJOG*. July 01, 2021;225(1):P51.E1-51.E17. DOI: <https://doi.org/10.1016/j.ajog.2021.01.014>



65. Rodríguez VE, LeBrón AMW, Chang J, Bristow RE. Racial-ethnic and socioeconomic disparities in guideline-adherent treatment for endometrial cancer. *Obstet Gynecol*. July 2021;138(1):21-31. doi: 10.1097/AOG.0000000000004424
66. Mezzich JE. Report of the First Peruvian Conference on Person Centered Medicine. *Int J Person Centered Med*. July 2020. DOI: 10.5750/ijpcm.v8i4.901
67. Filler T, Foster AM, Grace SL, Stewart DE, Straus SE, Gagliardi AR. Patient-centered care for women: Delphi Consensus on evidence-derived recommendations. *Value in Health*. 2020;23(8):1012-9. Doi: <https://doi.org/10.1016/j.jval.2020.03.017>
68. The power of the patient voice, How health care organizations empower patients and improve care delivery. *NEJM Catalyst*. <https://cssjs.nejm.org/landing-page/cj-ebook-2021/The-Power-of-the-Patient-Voice.pdf>
69. Córdoba Garcés R. Mujeres, violencia y crecimiento. *Diario El Comercio*, Lima, Perú. 6 de julio de 2021. Tomado del *Diario El Tiempo de Colombia*, GDA
70. ACOG Women's Preventive Services Initiative. Well-woman chart. <https://www.womenspreventivehealth.org/wellwomanchart/>
71. Weiß. Cuarentena por coronavirus dispara violencia contra las mujeres en América Latina. *Deutsche Welle*. 27 abril 2020. <https://p.dw.com/p/3bTqO>
72. Kempf E, Vogel M, Vogel T, Kratzsch J, Ladgraf A, et al. Dynamic alterations in linear growth and endocrine parameter in children with obesity and height reference values. *EClinicalMedicine*. June 23, 2021. DOI: <https://doi.org/10.1016/j.eclinm.2021.100977>
73. Anand V, Li Y, Liu B, Ghalwash M, Koski E, Ng K, et al. Islet autoimmunity and HLA markers of presymptomatic and clinical type 1 diabetes: joint analysis of prospective cohort studies in Finland, Germany, Sweden, and the U.S. *Diabetes Care*. Jun 2021, dc201836; DOI: 10.2337/dc20-1836
74. Usan análisis de datos para prevenir el cáncer. *Diario El Comercio*. Sábado 3 de julio de 2021.
75. *Revista-IDiPerú-Concytec-FINAL.pdf*. Concytec. Mayo-Julio 2021 N° 1, file:///D:/Download/Revista-IDiPeru%C%81-Concytec-FINAL.pdf
76. Instituto Nacional de Estadística e Informática. Perú: Estado de la Población en el año del Bicentenario, 2021. https://www.inei.gob.pe/media/MenuRecursivo/publicaciones_digitales/Est/Lib1803/libro.pdf