

copayment and will receive broad services, including the basic basket and complimentary health services. ●

**IS FEAR FROM MALPRACTICE CLAIMS AGAINST OBSTETRICIANS POSSIBLY RESPONSIBLE FOR THE RISE IN THE RATE OF CESAREAN SECTIONS?**

**David Rabinerson, Galia Oron, Rinnat Gabbay – Benziv**  
Helen Schneider's Hospital for Women, Rabin Medical Center, Petach Tikva

In recent years there is a growing local, as well as global, tendency among obstetricians to end labor by cesarean section in various circumstances. Current literature suggests that the leading factor for this preference is closely related to the amount of malpractice allegations submitted against obstetricians. The extensive use of cesarean sections has its toll in reducing the skills of future obstetricians in handling breech, instrumental and vaginal delivery after cesarean section and vaginal delivery of twins, and other types of deliveries. The acceptance of the absolute autonomy of the parturient on her body, combined with rising prevalence of a cesarean section upon maternal request, has further added to the use of cesarean sections. In the present review, various aspects that led to the rise in the numbers of cesarean sections performed are discussed. ●

**ACHALASIA: UPDATES ON DIAGNOSIS AND MANAGEMENT FROM THE LAST DECADE**

**Amir Mari<sup>1,2</sup>, Fadi Abu Backer<sup>1</sup>, Hana Amara<sup>2</sup>, Mahmud Mahamid<sup>2</sup>**  
<sup>1</sup>Gastroenterology Institute, Hillel Yaffe Medical Center, affiliated to the Ruth and Rappaport Faculty of Medicine, Haifa, Israel

<sup>2</sup>Gastroenterology Institute, Nazareth EMMS hospital, affiliated to the Faculty of Medicine in the Galilee, Bar-Ilan University

Achalasia is a rare idiopathic disease, associated with significant morbidity and negative impact on life quality. The disorder is characterized by impairments in the esophageal motility and loss of the lower esophageal sphincter (LES) relaxation. Achalasia symptoms include dysphagia, regurgitations, chest pain, vomiting and weight loss.

Diagnosis of achalasia is based on an appropriate clinical presentation and typical findings on complementary tests. These tests include endoscopy showing a dilated esophageal lumen containing fluid or food, High-resolution manometry (HRM) shows evidence of obstruction at the gastro-esophageal junction and motility failure, and barium swallow shows esophageal dilation and distal narrowing.

The recent advent of HRM has permitted more precise diagnosis of achalasia and three subtype designations, based on the pattern of esophageal motility disorders, as per the Chicago Classification. Treatment options include: drugs, endoscopic by means of Botox injection or balloon dilation, and the traditional surgery, laparoscopic Heller myotomy (LHM). The new advent in treatment is the novel per-oral endoscopic myotomy (POEM), a less invasive therapy, approaching the traditional LHM. Since the first POEM procedure performed in 2008, massive amounts of evidence are accumulating regarding the high efficacy and safety profiles of POEM, introducing it as an excellent first line treatment. The current review discusses the diagnosis and management of achalasia, with special highlights on the recent progress of HRM and POEM. ●

כרוניקה

**נוגדנים ייחודיים לנגיף דנגי מרפאים ומונעים הדבקה בזיקה בעכברים ובקופים**



הנוגדנים בדם למשך שבעה ימים, שהגנה עליהם בפני הדבקות תגר בזיקה. ניסויים בקופי רזוס, בהזרקות נוגדנים לפני או אחרי הזרקות תגר של מיליון יחידות נגיף, סיפקו תוצאות דומות. הזרקות נוגדנים יומיים לאחר ההדבקה עצרה את המחלה וסילקה את כל הנגיפים מהדם. החוקרים לא זיהו "מילוט" נגיף עקב הטיפול, נתון המצביע על סף גבוה של הימלטות נגיף בטיפול זה. החוקרים מציעים שכיוון טיפול זה עשוי להועיל במניעה של מחלת זיקה בבני אדם או בריפוייה.

איתן ישראלי

עקב הנזקים הנגרמים לעובר כשאישה הרה נדבקת בנגיף זיקה, מחפשים החוקרים דרכי מניעה בעזרת תרופות או נוגדנים. **אבניק וחב'** (Nature Med 2018;24:721) מדווחים על איפיון נוגדנים לנגיף דנגי המסוגלים לנטרל נגיפי זיקה. כיוון מחקר זה מרשים במיוחד, מאחר שדווח על תופעה של החמרת מחלת זיקה עקב הימצאות נוגדני דנגי בדם המטופלים. החוקרים איפיינו מספר נוגדנים חד שבטיים המכוונים לדמור E בין זנב וראש הנגיף, המסוגלים לנטרל נגיפי זיקה, ואחד מהם 10B היה פעיל ביותר. בהזרקה לעכברים הושגה רמה גבוהה של

discovery of X-rays, and in 1906 among human radiation technicians. However, the exact mechanisms underlining this pathology have yet to be uncovered. In particular, the question as to whether radiation-induced cataract is a deterministic event, meaning a threshold dose must be exceeded in order for it to develop, still remains. Recent epidemiological studies, performed on populations exposed to lower radiation doses than those previously perceived cataractogenic, have led the International Commission on Radiological Protection (ICRP) in April 2011 to reduce its eye dose threshold for cataract induction from 2 Gy to 0.5 Gy, and the occupational annual dose limit from 150 mSv to 20 mSv/year. However, the ICRP have yet to support a stochastic effect (linear non-threshold) for radiation-induced cataract, although suggested by several studies. In this article, we review the current knowledge on radiation-induced cataract, including the speculated mechanism for its development, evidence for genetically predisposed populations, and the main recent epidemiological studies. ●

## ESTABLISHING A REGISTRY FOR INFLAMMATORY BOWEL DISEASE PATIENTS IN MACCABI HEALTHCARE SERVICES - JOINT PROJECT BETWEEN HOSPITALS, EPI-IIRN GROUP AND COMMUNITY MEDICINE

Revital Kariv<sup>1,2,3</sup>, Dan Turner<sup>4</sup>, Joseph Rosenblum<sup>5</sup>, Vered Morad<sup>5</sup>, Nir Zigman<sup>5</sup>, Mira Friedman<sup>4</sup>, Gili Focht<sup>4</sup>, Oren Leder<sup>4</sup>, Malka Avitzour<sup>4</sup>, Iris Goren<sup>5</sup>

<sup>1</sup>Health Division, Maccabi Healthcare Services

<sup>2</sup>Department of Gastroenterology, Tel Aviv Sourasky Medical Center

<sup>3</sup>Faculty of Medicine, Tel Aviv University

<sup>4</sup>The Juliet Keiden Institute of Pediatric Gastroenterology and Nutrition

Shaare Zedek Medical Center, the Hebrew University of Jerusalem

<sup>5</sup>Medical Informatics, Maccabi Healthcare Services

**Introduction:** Inflammatory bowel diseases (IBD) are becoming a significant cause for chronic long term complex morbidity, particularly among adolescents and young adults. IBD patients require multidisciplinary management and considerable health resources. Recent advances and developments in the diagnostics and therapeutic options require identification and tight monitoring of these patients at both hospital and community level for better management and care.

**Aim:** To establish at Maccabi Healthcare Services (MHS) a dedicated registry for inflammatory bowel disease patients for long term monitoring in order to optimize care, better use of health resources and to promote high quality research.

**Methods:** A national project, initiated and headed by a team from Shaare Zedek Medical Center aimed to resolve the complexity in identifying IBD patients at the community setting. The project included data from all Israeli HMOs and major hospitals, that was incorporated into various algorithms to determine prevalence and incidence and to distinguish between Crohn's disease and ulcerative colitis diagnoses.

Eventually, an algorithm that includes the number of diagnoses, number of purchases and duration of IBD-related medications showed the best results for separating those that suffer from IBD and those that do not. This algorithm was further validated by chart review.

**Results:** According to the established registry criteria there were 14488 IBD patients in MHS, 13000 active. Additionally we have established an ongoing platform for ongoing monitoring of clinical, therapeutic, laboratory and imaging information.

**Discussion:** Establishing an IBD registry in MHS was enabled by a national project that combined deep professional knowledge of the disease by leading academic centers together with advanced informatics and community large data. We now move on to operate the registry in real life, together with live monitoring of various parameters in order to promote excellent care, communication with patients, management and control and to enable prospective high quality research. ●

## OUTSOURCING OF MEDICAL SERVICES FOR SOLDIERS TO CIVILIAN HEALTH FUNDS

Nachman Ash

Maccabi Healthcare Services

Ariel University

The Israeli Medical Corps provides a great deal of medical services by its own medical personnel and purchases some services from various civilian suppliers, including public hospitals. Although the IDF has bought hospital services since it's early days, few attempts have been made to purchase primary and secondary medical services for soldiers in rear units.

This article presents an analysis of the outsourcing project ("Aviv" project) of medical services for rear units which was operating between the years 2010–2014. In this project soldiers chose to receive services from one of the four healthcare funds in Israel. The project is analyzed from two perspectives, military and civilian, based on the personal experience of the author who led the implementation of the project while he was the Surgeon General of the Medical Corps and gained additional experience at a later stage during his positions in Maccabi Healthcare Services.

Despite the different policies of the medical corps and the healthcare funds that are described in the article, it is advisable to utilize the civilian infrastructure in Israel to provide soldiers with better medical services. Future projects should consider the lessons learned from the Aviv project and adjust the demands of the Medical Corps from the healthcare funds, so that soldiers will receive similar services to their civilian counterparts. Among other recommendations, the author advises that soldiers will pay

symptom appeared. The pregnancy passed with only mild nausea and vomiting.

**Discussion:** Several controlled randomized studies have shown the effectiveness of pre-emptive therapy in preventing a repeat of HG symptoms. ●

## FETAL ALCOHOL SPECTRUM DISORDER (FASD) AND ADOPTIONS FROM THE FORMER SOVIET UNION

Gideon Koren<sup>1,2,3</sup>, Rana Cohen<sup>2</sup>

<sup>1</sup>Maccabi Institute of Research and Innovation

<sup>2</sup>Motherisk Israel, Assaf Harofe Hospital

<sup>3</sup>Tel Aviv University

**Introduction:** Fetal alcohol spectrum disorder is presently estimated to affect more than 1-2% of babies in North America. In Israel it is quite rarely diagnosed. Many of the children adopted from the former Soviet Union were born to alcoholic women.

**Case Report:** A 4.5 year old boy adopted from Ukraine, presented with inattention, hyperactivity and aggressiveness. He was born with severe intra-uterine growth restriction (IUGR) and continued to grow on the 3<sup>rd</sup> percentile. His biological mother was alcohol dependent.

**Discussion:** This case highlights the need to consider the differential diagnosis of children with ADHD plus aggressive behavior, as well as maintaining a high index of suspicion of FASD in children adopted from the Soviet Union. ●

## RATES OF MICROCEPHALY AMONG NEONATES IN AIR POLLUTED REGIONS OF HAIFA BAY

Gideon Koren, Rachel Katz, Varda Shalev

Kahn - Maccabi Institute of Research and Innovation

Tel Aviv University

**Background:** In 2016 Israeli news media reported preliminary results of research claiming higher incidence of microcephaly among newborns in air polluted areas in Haifa Bay. These news prompted high levels of anxiety and anger.

**Objectives:** To quantify the incidence of microcephaly in Haifa Bay and compare it to the rest of Israel.

**Methods:** Employing Maccabi electronic health records to compare rates of microcephaly among neonates followed up in Maccabi's well-baby clinics to the same clinics in the rest of Israel.

**Results:** Mean head circumference percentile was similar in Haifa Bay and the rest of Israel (38.09+/- 26.42 vs 37.59+/-25.62), as was the rate of microcephaly (4.92% vs. 4.83%)

**Discussion:** Air pollution is not associated with higher rates of microcephaly in Haifa Bay.

**Conclusions:** These findings do not support air pollution as an etiological factor of microcephaly in Haifa Bay. ●

## COMMUNITY PEDIATRICS IN ISRAEL DURING THE NEXT DECADE – A NEED FOR A CHANGE

Jacob Kuint<sup>1,2,3</sup>, Basil Porter<sup>2,4</sup>

<sup>1</sup>Pediatrics Division, Maccabi Healthcare Services

<sup>2</sup>Goshen Foundation for Community Child Health and Wellbeing, Israel

<sup>3</sup>Sackler Faculty of Medicine, Tel Aviv University, Israel

<sup>4</sup>Maccabi Healthcare Services, Tel Aviv, Israel

Community pediatrics in Israel is based on service by pediatricians who have been trained in hospitals in Israel or elsewhere. At the same time, the field of community pediatrics is changing its nature from the management of common acute diseases, to a field dealing with a variety of chronic problems, behavioral issues, family and social issues, developmental delays, problems relating to nutrition and growth' sleep problems, learning disabilities, and of late, excessive exposure to a host of digital media. In addition, lifestyle issues such as adequate physical activity, addictions, accidents and various types of abuse are increasingly part of the pediatric role.

The hospital-based residency training of pediatricians does not offer the future pediatrician the opportunity to learn these elements of the "New Morbidity". As a result, many community-based pediatricians choose not to confront these problems, and either ignore them or refer them to various consultants outside of the clinic.

The entire health system, including the Ministry of Health, the Israel Medical Association, the medical schools, the health service providers (Kupot Holim) and the hospitals must cooperate in changing the format of residency training, both undergraduate and residency. This is required in order to create a new generation of pediatricians who are better equipped to deal with the increasing number of children needing help with the above-mentioned pathology. Advancing the field of primary care pediatrics by attending to these New Morbidity issues, together with pediatric involvement in community agencies, after appropriate training, will improve the health and development of the child population, together with improvement of their physical, emotional and social welfare. ●

## IONIZING RADIATION AND THE RISK FOR CATARACT AND LENS OPACITIES

Alon Peled<sup>1</sup>, Shlomo Moshe<sup>1,2</sup>, Gabriel Chodick<sup>1,3</sup>

<sup>1</sup>Sackler Faculty of Medicine, Tel Aviv University, Tel Aviv, Israel

<sup>2</sup>Occupational Health, Jerusalem and Shfela District, Maccabi Healthcare Services

<sup>3</sup>Medical Division, Maccabi Healthcare Services, Tel Aviv, Israel

The lens of the eye is among the most sensitive organs to ionizing radiation in the human body. The cataract is the earliest documented side effect of ionizing radiation, first reported in lab animals in 1897, only a year after the

## QUANTIFYING PATIENTS' DRUG ADHERENCE BY ELECTRONIC RECORDS OF DRUG PURCHASING

Dalia Weitzman, Gideon Koren

Kahn - Maccabi Institute of Research and Innovation

**Introduction:** One of the most widely used methods for estimating patient adherence to drug therapy is the use of proportion of days covered (PDC), which is based on the assumption that patients who chronically purchase a drug do actually consume it.

**Objectives:** To investigate whether PDC reflect adherence based on steady state levels of lithium.

**Methods:** Using data on over 2000 patients on lithium in steady state, we correlated PDC with lithium steady state serum concentrations.

**Results:** In the case of lithium, PDC did not predict serum concentrations of the drug. This is probably due to poor and inconsistent adherence, which may stem from the medical condition itself.

**Conclusions:** The use of PDC cannot be assumed to avidly reflect drug adherence in all cases, and should be validated in different drugs and varying medical conditions.

**Discussion:** Steady purchasing of a medication cannot be assumed to reflect excellent adherence. Studies based on PDC must be scrutinized carefully for evidence of adherence. ●

## DIEFFENBACHIA POISONING

Yishai Mintzker<sup>1,2</sup>, Yedidia Bentur<sup>3,4</sup>

<sup>1</sup>Family Medicine Department, Maccabi Healthcare Services, Rakefet, Israel

<sup>2</sup>The Faculty of Medicine in the Galilee, Bar Ilan University, Zafed, Israel

<sup>3</sup>Clinical Pharmacology and Toxicology Section, Israel Poison Information Center, Rambam Health Care Campus, Haifa, Israel

<sup>4</sup>The Rappaport Faculty of Medicine, Technion - Israel Institute of Technology, Haifa, Israel

A 70-year-old woman suffered severe irritation in her oral cavity after biting *Dieffenbachia amoena* petiole. She was treated a few hours after the exposure with systemic and local analgesics, as well as with systemic first generation antihistamine, and her symptoms improved rapidly. *Dieffenbachia* is a common household plant that contains oxalate raphides which cause irritation and microtrauma. Injuries are caused by exposure through the mouth, and also by contact with eyes or skin.

Clinical presentation is dependent on the route of exposure. It includes pain and edema in the oral cavity following biting the leaves or the stem of the plant. Direct oral contact with the plant juice can also cause symptoms. There are some case reports of severe injuries that caused oro-pharyngeal inflammation and edema, with impending obstruction of the upper airways.

Treatment includes respiratory support. Water or milk can be given to alleviate oral and throat irritation; some clinicians recommend first generation antihistamines. It should be noted that treatment recommendations are based on reports, not on clinical trials. ●

## COLONSCORE: THE USE OF MACHINE LEARNING OF BIG DATA TO DETECT COLORECTAL CANCER

Maya Cohn Adulamy, Varda Shalev

The Kahn - Maccabi Institute of Research and Innovation

The use of big data is in its first years of entering the medical world. Big data research enables analysis of very large volumes of data, identifying patterns and findings which traditional statistical methods cannot handle. The diagnosis of colorectal cancer is often missed due to people's non-adherence to the occult fecal blood screening tool. We describe the case of a patient that led to the development of a novel big data algorithm to diagnose colorectal cancer. A 70 year old, previously healthy man, was diagnosed with metastatic colorectal cancer and succumbed to his illness. He skipped his fecal occult blood screening tests. His blood counts over the previous years showed a steady decrease in hemoglobin, still within the normal range, 3 years before his diagnosis. This trend was confirmed in a large epidemiological study, which has led to the development of a novel algorithm for the diagnosis of colorectal cancer based on repeated blood tests.

The use of algorithms created based on the analysis of big data is a new field in medicine. In this case, the "colonscore" algorithm is being applied in a large health program in Israel, and in its first year of operation it has identified cases with higher specificity and sensitivity than the fecal occult blood test. ●

## PRE-EMPTIVE TREATMENT FOR HYPEREMESIS GRAVIDARUM

Rana Cohen<sup>1</sup>, Gideon Koren<sup>1,2</sup>

<sup>1</sup>Motherisk Israel, Clinical Pharmacology Unit, Assaf Harofe Hospital

<sup>2</sup>Kahn Maccabi Institute for Research and Innovation

**Background:** Hyperemesis gravidarum (HG) affects around 1% of pregnant women. The experience is traumatic, and many women hesitate to start a subsequent pregnancy in view of the tendency of HG to re-occur.

**Case Report:** A 25 year old woman who experienced HG in her previous pregnancy was very afraid to start a second pregnancy, as she considered the termination of the first, traumatic pregnancy. She was advised to use pre-emptive antiemetic therapy with an anti emetic drug before any

## MACCABI HEALTHCARE SERVICES - INNOVATION AS A WAY OF LIFE

**Gideon Koren**

Maccabi - Kahn Institute of Research and Innovation, Tel Aviv, Israel

This issue of "Harefuah" is dedicated to major milestones of research and innovation achieved by clinicians and researchers at Maccabi Healthcare Services, insuring 2.5 million Israelis.

The "Colonscore" discovery is a powerful example of an observation made by a Maccabi family physician, who noticed that in patients with colorectal cancer, hemoglobin levels begin to fall a whole 3 years before diagnosis. However, due to the fact that for much of this time the levels are still within the normal range, this signal is being missed. After proving this observation in a very large epidemiological study, using machine learning techniques on big data, an algorithm was validated, which signals at high sensitivity and specificity patients at risk for colon cancer. But this discovery did not end up just as a scientific paper in a major journal. Rather it was implemented in all Maccabi's practitioners' offices, and since its implementation, it has identified over 60 patients with cancer that would otherwise have been diagnosed much later, when the cancer would have advanced and become irreversible.

This breakthrough is now being adopted in major health systems worldwide.

This special issue covers 13 such examples stemming from all areas of medicine, from pediatrics, gastroenterology, radiology, pharmacology and toxicology, public health to military medicine.

Creating a new climate of innovation necessitates conceptual changes among many clinicians. As an expression of its strong commitment to research and innovation, in August 2018 Maccabi inaugurated an innovative program training primary physicians and residents for a career synthesizing clinical practice and research. Trainees are mentored and supported academically and financially to conduct high level research that will directly affect the quality of patient care.

It is hoped that this issue of Harefuah will inspire clinicians in all parts of the health system to adopt innovation as a way of life. ●

## CHANGE IN HEALTHCARE UTILIZATION FOLLOWING DOCUMENTARY TV PROGRAM ABOUT YOUNG BREAST CANCER PATIENTS

**Yossi Kuchnir<sup>1,2</sup>, Itzhak Zeidise<sup>2,3</sup>, Clara Weil<sup>4</sup>, Varda Shaley<sup>5,6</sup>**

<sup>1</sup>The Family Medicine Residency Program, Maccabi Healthcare Services

<sup>2</sup>School of Public Health, Faculty of Social Welfare and Health Sciences, University of Haifa

<sup>3</sup>Sheba Medical Center

<sup>4</sup>Maccabitech – Institute for Research and Innovation, Maccabi Healthcare Services

<sup>5</sup>School of Public Health, Sackler Faculty of Medicine, Tel-Aviv University

<sup>6</sup>Maccabi Healthcare Services

**Background:** Personal decision-making concerning health can be heavily influenced by the way mass media conveys health messages and news. Research has shown that there is a connection between health news publications and changes in healthcare utilization, not always for the better. In March 2014 a program about young breast cancer patients was broadcasted as part of the popular Israeli documentary TV series "Uvda" (fact), which gained a lot of publicity. We examined whether there is a connection between the controversial program and changes in healthcare utilization in the field of breast cancer detection in Maccabi, the second largest HMO in Israel.

**Methods:** We conducted a retrospective large data population-based study, using Interrupted Time Series Design. Trends in healthcare utilization were examined starting 3 years prior to until one year after the TV program. All Maccabi female patients aged 20 to 74 were included after receiving the approval of the Institutional Review Board (IRB) committee. The rate of doctors' visits, mammography and breast ultrasound referrals were examined, as well as actual performance of these tests. Socio-demographic parameters of patients and referring doctors were analyzed. The data was extracted from the Maccabi computerized database and analysed using SPSS software version 21, controlled for seasonality.

**Results:** Data was available for 656,581 female patients from January 2011 until June 2015. A surge in mammography referral rates was shown following the TV program about young female breast cancer patients, especially concerning young patients referred to their first mammography scan. The proportion of young women, among all women referred to mammography, doubled in the specific quartile the program was broadcast. A similar trend was shown for the actual performance of mammography scans. We did not find a significant surge in doctors' visits following the TV program, beyond the background trend of increasing visit rates over the years studied.

**Conclusions:** Although causality cannot be proven, we can speculate that changes in healthcare services utilization in the field of breast cancer detection among young female patients were partly connected to the effects of the TV show on this issue. These effects can have serious implications on health, including anxiety, false positive test results and over-diagnosis of breast cancer. Therefore, there is a need to find ways to cooperate with the mass media professionals in order to convey to the public more correct and balanced health data in a way that will be better understood. Thereby, we can fulfill our mission of raising the level of public health in the era of rising costs. ●