Medical Article Discussion Course

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MANABI.st Medical Article Discussionコース

コース概要

このコースは12 年以上製薬業界の第一線で活躍する Sharon BeltrandelRio先生が MANABI.st のホームページ上で連載しております医療コラムを題材に作成したものです。コラムはその時々の医療・製薬業界の動向について書かれたもので、レッスンは各コラムを読みディスカッション形式に行われます。

医療業界に勤めていらっしゃる方で同僚や顧客・患者さんとより円滑にコミュニケーションを図りたい方や医療関係の国際会議に出席される方で外国人出席者とのコミュニケーションをより図りたい方々向けのコースとなっております。

授業は1レッスン＝1トピックで進みます（もちろん1トピックに1レッスン以上利用されても構いません）。トピック毎に6－8つの質問が事前課題として記載されております。

コース受講方法

1. トピックは30個あります。以下が各トピックの概要です。

TOPIC 1: New Obesity Treatments on the Horizon （肥満治療）
TOPIC 2: The Pharmaceutical Industry and Direct-to-Consumer Advertising: What Can Japan and Europe Learn from the U.S.?
TOPIC 3: The FDA in 2004: Highs and Lows (2004 年度の FDA 総括)
TOPIC 4: When Giants Stumble (Merck's withdrawal of Vioxx?)
TOPIC 5: Are There Differences Between Men and Women Suffering from Heart Diseases? （心臓病の性別要因）
TOPIC 6: When Spring is Around the Corner…So is Hay Fever Season （春はすぐそこ 花粉症の季節です）
TOPIC 7: Alzheimer's disease and Dementia: Two More Reasons to Watch your Waistline (ウェーストラインに注意！)
TOPIC 8: Gastric Cancer in Japan （日本の胃癌事情）
TOPIC 9: A Brief Look at Age-related Macular Degeneration（加齢性黄斑変性症）
TOPIC 10: The Human Skeleton (人間の骨格)
TOPIC 11: Osteoporosis: Not Just a Women's Disease (骨粗しょう症)
TOPIC 12: Arthritis: A Description of Three Common Disease Types (関節炎)
TOPIC 13: How Long is Too Long?（日本の患者の平均入院日数は異常に長い？）
TOPIC 14: Knee Replacement Surgery Part 1 膝関節移植手術①
TOPIC 15: Knee Replacement Surgery Part 2 膝関節移植手術②
TOPIC 16: An introduction to Type 2 Diabetes 2型糖尿病
TOPIC 17: An introduction to Type 1 Diabetes 1型糖尿病
TOPIC 18: The Mind's Effect on the Body プラシーボ効果及び白衣高血圧症
TOPIC 19: Counting Sheep: The Importance of a Good Night's Sleep 不眠治療の現状
TOPIC 20: Chronic Obstructive Pulmonary Disorder (COPD) 慢性閉塞性肺疾患
TOPIC 21: Schizophrenia -Part one- 統合失調症①
TOPIC 22: Schizophrenia -Part two- 統合失調症②
TOPIC 23 Autism 自閉症
TOPIC 24 Depression うつ病
TOPIC 25 Metabolic Syndrome メタボリック症候群
TOPIC 26 Traumatic Brain Injury (Part 1) 外傷性脳損傷
TOPIC 27: Traumatic Brain Injury (Part 2) 外傷性脳損傷2
TOPIC 28: Healthcare Professionals' Alphabet Soup ヘルスケア・医療業界人の肩書き
TOPIC 29: Colorectal Cancer 結腸直腸癌
TOPIC 30: Health insurance and emergency care 医療保険及び緊急医療

2. まず『ログイン後』→『コースを探す』→ 医療英語 > テキストの使用 > MANABI.st Medical Article Discussionコースよりご予約下さい。

3. トピックの内最も話しやすいトピックを選び『先生への伝言』板を利用し先生に伝えてください。

4. 選択されたトピックをよく読み事前課題に対する答えを準備してください。

5. レッスンは質問に沿って行われますが、脱線しても一向に構いません。質問を全てカバーできなくても気になさらないで下さい。本コースの目的はあくまで医療分野におきましてより高いコミュニケーション能力をつけて頂くもので、一つの質問で深い議論になる可能性ももちろんございます。1トピックに1レッスン以上利用されても構いません。ご自分のペースでレッスンを受講いただければ幸いです。

6. 既にやられたトピックを別の先生とDiscussionされるのもお勧めします。その場合、『先生への伝言』を通じ、"I have already done this topic with a different teacher so I would like to have a free discussion using this topic"とお書き下さい。

Topic 1: New Obesity Treatments on the Horizon

Obesity is becoming a problem of epidemic proportions. According the World Health Association, there are more than 300 million obese adults (body mass index or BMI > 30) worldwide[1]. In the U.S., approximately 9 million adults suffer from extreme obesity (BMI > 40), approximately 60 million suffer from obesity (BMI > 30), and approximately 127 million are overweight (BMI > 25)[2] . Analysts predict that the prevalence of obesity and extreme obesity will increase to 168 million in the U.S. by 2012[3]. Overweight and obese people have an increased incidence of a number of serious diseases, including diabetes, cardiovascular disease, hypertension and stroke, and certain forms of cancer[4]. The health consequences of obesity range from increased risk of premature death to serious chronic conditions that reduce the overall quality of life. Furthermore, the National Institutes of Health calculate that overweight and obese individuals cost the U.S. about $122.9 billion per year[5]. Obesity and related ailments result in at least $62.7 million in doctors' visits and $39.3 million in lost workdays[6].

Currently there are not many options for treating obesity. Pharmacological therapies (Xenical®/orlistat and Meridia® or Reductil®/subutramine) have shown little efficacy in the treatment of obesity. They typically produce a 5-10% reduction in body weight and have unpleasant side effects. Sales of obesity drugs totaled about $526 million in 2004[7]. Bariatric surgery is recommended only for extremely obese (BMI > 40) or obese people (BMI > 35) that also suffer from other serious medical conditions. The patients undergo a surgical procedure to reduce the size of their stomach and intestine. After the surgery, the patients become full with less food, and some of the calories ingested do not get absorbed, resulting in a very significant reduction in caloric intake. These patients typically lose 70% of their excess weight (50-60 kg) in 12 to 18 months following the surgery and they keep it off. The American Society for Bariatric Surgery estimates the number of gastric bypass surgeries performed in the U.S. increased from 16,800 in 1993 to 103,200 in 2003[8]. However, complications caused by the surgery may be as high as 10 percent or more[9].

However, promising new obesity treatments are on the horizon. Sanofi-Aventis' Acomplia™ (rimonabant) is expected to become the first obesity treatment to achieve blockbuster status. The drug affects the Endocannabinoid System, a natural physiological system believed to play a role in maintaining energy balance through the regulation of food intake and energy expenditure. The EC system is also believed to play a role in tobacco dependence. In overweight/obese people, excessive eating and fat accumulation is associated with over-activation of the EC System, which also becomes unbalanced with chronic tobacco use. In clinical trials, Acomplia treatment resulted in weight loss, reduced waist circumference and improvement of lipid and glucose metabolism. In those that smoke, the drug is thought to help people to stop smoking without significant post-cessation weight gain. Side effects included depression, headaches, dizziness and nausea. In June 2005, Sanofi-Aventis announced that the US FDA accepted for filing the company's New Drug Application (NDA) for Acomplia, and that a Marketing Authorization Application to the European Medicines Agency (EMEA) had also been submitted[10]. In February 2006, the company received an approvable letter from the FDA for weight management and a non approvable letter for smoking cessation. The EMEA review process is ongoing.

Another new obesity drug on the horizon is UK-based Alizyme's ATL-962 (celistat), which many analysts believe is the second most promising drug in the pipeline. It is a drug that reduces the absorption of dietary fat with a similar mechanism of action to Roche's Xenical. However, ATL-962 appears to have fewer side effects and lower production costs[11]. Alizyme recently completed a study in

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370 obese patients. After three months patients treated with ATL-962 showed similar weight loss to that seen with Xenical, however patients on ATL-962 experienced 90% fewer severe gastro intestinal side effects compared to patients receiving Xenical[12]. In January 2004, Takeda paid $3 million to exercise its rights to license and develop ATL-962 in Japan, and clinical trials are underway (the total agreement is worth up to $42 million including milestone payments, plus royalty payments). Analysts expect the drug to be launched in 2008[13].

Of course the best way to avoid obesity is to eat a healthy diet and exercise at least three times a week. However, for those who need help losing weight, hopefully these new treatments will assist them in achieving their weight-loss goals and thereby improve their health.

Discussion questions

1. Please summarize the article. What is the main point of the article?
2. What are the health and economic consequences of obesity?
3. Is the number of obese people increasing in Japan? Why or why not?
4. What obesity treatments are currently available?
5. What new obesity treatments are being developed?
6. What do you think is the best way to lost weight?

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Topic 2: The Pharmaceutical Industry and DTC[1] Advertising: What can Japan and Europe Learn from the US?

Whether watching the evening news or an afternoon soap opera, advertisements for prescription drugs to treat high blood pressure, high cholesterol, type 2 diabetes, erectile dysfunction, overactive bladder, depression and other common ailments and diseases fill commercial breaks on American television networks. Since the US Food and Drug Administration (FDA) legalized direct-to-consumer (DTC) broadcast advertising in 1997, Americans have been bombarded by advertisements for prescription drugs that treat all kinds of physical and psychological ailments.

What is DTC advertising for pharmaceuticals and what effects has it had on Americans' health and the pharmaceutical industry? In DTC advertising, prescription drug advertisements are aimed directly at the consumer. Traditionally, pharmaceutical companies promoted their drugs to doctors and medical professionals only. Although the FDA legalized DTC advertising in 1985, advertisements increased substantially after 1997, when the FDA allowed companies to name both the drug and the disease it treated in the same advertisement with just a brief summary of the possible side-effects instead of having to list every possible side-effect. According to IMS Health, pharmaceutical companies' spending on DTC advertising in the US increased from $75 million in 1996 to $2.5 billion in 2000.

Experts and analysts have mixed opinions regarding the effects of DTC advertising on Americans' health. According to FDA survey results released in 2003, DTC ads help educate patients about their health problems and provide greater awareness of treatments. The 500-physician survey indicated that when a patient asked about a drug, 88 percent of the time they had the condition that the drug treated. Furthermore, 80 percent of physicians believed patients understood what condition the drug treats. However, approximately 75 percent of physicians believed that DTC ads lead patients to believe that the drug works better than it does, and many physicians felt some pressure to prescribe something when patients mentioned DTC ads.

All experts agree that drugs carry risks, and that each drug's benefits must be weighed against its risks. However, some observers believe that due to DTC advertising, new drugs are used by more people faster than ever before, creating a potential problem if the drugs have unanswered safety questions. The FDA has been criticized for being negligent in its role of policing drug safety, but its recent warning to Pfizer that its DTC advertising made "misleading" safety and efficacy claims about cox-2 inhibitors Celebrex® and Bextra® indicates that the agency is becoming stricter.

Critics blame DTC advertising for contributing to the high cost of American healthcare, in which prescription drugs are the fastest-growing part of total healthcare costs. For example, cox-2 inhibitors such as Merck's Vioxx® and Pfizer's Celebrex® were advertised for all patients, regardless of the fact that cheaper retail medications such as Ibuprofen work just as well for most patients. The US pharmaceutical industry maintains that DTC advertising increases patient awareness of innovative treatments and improves compliance.

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What does the future hold for DTC advertising? Will it be introduced in Europe and Japan? In the US, the FDA commissioned three surveys to help it decide whether DTC advertising rules need to be changed. Health authorities in Japan and Europe are closely watching the effects of DTC advertising in the US. It is interesting to note that although pharmaceutical companies publicly support DTC advertising in the US, top executives from GlaxoSmithKline and AstraZeneca recently told a British parliamentary committee that they did not believe that it was appropriate to allow pharmaceutical companies to advertise medicines in public places in the UK. It appears that discussions between pharmaceutical companies and health authorities regarding DTC advertising will continue. Hopefully each country will find a solution that is culturally appropriate and that will provide the benefits of DTC advertising, such as increasing people's awareness of and accountability for their health.

Discussion questions

1. Please summarize the article. What is the author's main point?
2. What is DTC advertising?
3. When did DTC advertising for pharmaceuticals become popular in the United States?
4. What are the benefits of DTC advertising?
5. What are the risks or negative aspects of DTC advertising?
6. Do you think that DTC advertising for pharmaceuticals should be allowed in Japan? Why or why not?

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1. Direct-to-consumer advertising

Written by Sharon BeltrandelRio

Topic 3: The FDA in 2004: Highs and Lows
(2004 年度の FDA 総括)

Based on recent headlines, it may appear that the U.S. Food and Drug Administration (FDA) had a rough year in 2004. On September 30th, Merck withdrew its blockbuster cox-2 inhibitor Vioxx? from the market. On October 16th, the FDA ordered pharmaceutical companies to include a "black box" warning on the labels of antidepressants, linking the drugs to an increased risk of suicide or suicidal thoughts among young people. A "black box" warning is the FDA's strongest safety alert and is one step below banning the drug. In both cases critics have been vocal in saying that the agency is not doing enough to safeguard public health.

In an attempt to improve the situation, President Bush has recently increased the FDA's funding (but only moderately) and a new oversight board has been created to supervise safety issues. The agency has not had a permanent leader for more than a year, but President Bush's nominee, Dr. Lester Crawford, who has been the acting commissioner for the past year, is undergoing confirmation hearings in the U.S. Senate this week.

A bright spot in the FDA's 2004 activities is the large number of new drug approvals. Last year the FDA approved more new medicines than in any of the previous eight years. In 2004, a total of 113 new drugs were approved, compared to 87 approvals in 2003. The last time that the FDA approved more than one hundred drugs in one year was in 1997, when 121 drugs were approved.

Very importantly, 31 of the new drugs are new molecular entities (NME), nearly double the number of NME's approved in 2003. A new molecular entity is an active pharmaceutical ingredient in a dosage form that has never been approved for marketing in the U.S. NME's often represent novel treatments for diseases. Some of the most promising new drugs approved in 2004 include:

Avastatin (Genentech) - The first angiogenesis inhibitor to be approved for marketing. Avastatin is for the treatment of first-line or previously untreated metastatic cancer of the colon or rectum.
Cymbalta (Eli Lilly) - The first drug approved to treat the pain caused by diabetic peripheral neuropathy. Cymbalta was also approved for the treatment of major depressive disorder in 2004.
Spiriva HandiHaler (Boehringer Ingelheim Pharmaceuticals) - The first once-daily inhaled drug to improve lung function for patients with chronic obstructive pulmonary disease.
Tysabri (Biogen Idec and Elan) - The first humanized monoclonal antibody approved for treating multiple sclerosis. The drug works by inhibiting adhesion molecules on the surface of immune cells.

All medicines have risks and benefits. One of the most important parts of the FDA's mission is promoting public health by promptly and efficiently reviewing clinical research and taking appropriate action on the marketing of regulated products in a timely manner. Hopefully the FDA will soon obtain a permanent commissioner to provide the agency with the additional strength and stability it needs to overcome and learn from the low points of 2004, and to continue carrying out its mission of promoting public health.

Written by Sharon BeltrandelRio

Discussion questions

1. Please summarize the article. What is the main point of the article?

2. Why was 2004 a rough year for the FDA?

3. What positive events occurred in 2004?

4. What is a new medical entity (NME)?

5. What promising new drugs were approved by the FDA in 2004?

6. What promising new drugs have recently been approved in Japan? What are the benefits of these new drugs?*

Written by Sharon BeltrandelRio

Topic 4: When Giants Stumble

On September 30, 2004, pharmaceutical giant Merck announced the voluntary withdrawal of its multi-billion dollar arthritis drug, Vioxx®, because new clinical trial data found that Vioxx doubled the risk of cardiovascular events, including heart attack and stroke, after 18 months of use. Vioxx, which belongs to a class of drugs called cox-2 inhibitors used to treat pain and inflammatory illnesses, was launched in the US in 1999, and it has been used by more than 80 million people around the world. Sales of Vioxx totaled $2.5 billion in 2003, making it Merck's second best-selling drug. Given the magnitude of this event and its effects on Merck, it is not surprising that several aspects of the pharmaceutical and biotechnology industry are feeling the ramifications.

In the area of research, the withdrawal of Vioxx has led to an increased focus on biomarkers. As defined by the US National Institute of Health (NIH), a biomarker is a characteristic that can be objectively measured and evaluated as an indicator of normal biological processes, pathogenic processes or pharmacological responses to a therapeutic intervention. In other words, biomarkers are biological markers that would allow doctors to determine whether a patient will respond to a particular drug. Scientists believe that in the future, physicians might be able to run a battery of tests on each patient before prescribing any medication to make sure that the drug will actually provide some benefit to the patient. Pharmaceutical companies are dedicating additional funds to this area of research, and there are new opportunities for biotechnology companies such as Caprion Pharmaceuticals, Aclara Biosciences and Power3 Medical Products. These companies have recently formed collaborations with pharmaceutical companies such as AstraZeneca, GlaxoSmithKline and Wyeth to discover biomarkers.

The development and approval process for new pharmaceutical agents has also been affected by the Vioxx withdrawal. Companies have increased their attention on the development process and strategy, including the types of clinical trials to be conducted and the information to be gained. Regulatory agencies such as the US Food and Drug Administration (FDA) are expected to apply more scrutiny than ever before and could increase the number of clinical trials required both prior to approval and after approval. Merck's second-generation cox-2 inhibitor, called Arcoxia, is currently under review at the FDA. However, now the FDA is likely to request more safety data, not only from Merck but also from other companies developing cox-2 inhibitors.

In the area of sales and marketing, companies will continue to question whether their reliance on a few blockbusters is the best strategy. Given the lawsuits that have been filed against Merck in the US, all companies must review their risk management plans, since virtually all medicines carry a risk of side effects that may not be decisively recognized until millions of people have taken the drugs. Pfizer, the maker of Vioxx's main competitors, Celebrex and Bextra, has reviewed its studies and has not seen cardiovascular problems. Pfizer does not plan to stop selling its drugs, and Novartis and Merck, both of which are developing new cox-2 inhibitors, plan to continue developing drugs in this lucrative area.

Given the wide-ranging effects of the withdrawal of Vioxx, some experts question whether Merck can survive as an independent company, especially since Zocor®, its best selling drug for treating high cholesterol, loses patent protection in early 2006. Merck has distinguished itself as a top company in many areas, ranging from its ground-breaking scientific research to awards for its human resource management. Its ability to weather this current quandary will truly test the company. However, during this trying time, hopefully they will keep in mind that

> It's not what happens to you that counts, but how you handle it.
> It's not how far you *fall*, but how well you *bounce*.

Hopefully Merck will persevere and continue its rich tradition as a top pharmaceutical company, and continue to contribute to the advancement of human health.

Discussion questions

1. What is the main point of this article?
2. What is Vioxx? What illnesses does it treat?
3. Why did Merck stop selling Vioxx?
4. What are biomarkers?
5. Are regulatory agencies such as the US FDA becoming stricter? Why or why not?
6. Why do companies need risk management plans?
7. What does the phrase “It’s not how far you fall, but how well you bounce” mean?

Written by Sharon BeltrandelRio

Topic 5
Are There Differences Between Men and Women Suffering from Heart Diseases?（心臓病の性別要因）

Heart diseases are diseases that affect the heart such as heart attacks, heart failure and arrhythmia. They are the second leading cause of death in Japan. The incidence of heart diseases in both men and women is escalating around the world due to an increase in fat and cholesterol intake, lack of exercise, smoking and longer life spans.

Physically men's and women's hearts are the same. But studies show that when suffering from heart diseases variations emerge. For example, when suffering from a heart attack, although both men and women may present 'classic' chest pain (pain that begins in the chest and spreads to the shoulders, neck and arms), women seem to have a greater tendency than men to suffer from atypical chest pain, abdominal pain, dyspnea (difficulty breathing), nausea and fatigue. In addition, women tend to have heart attacks later in life compared to men and a woman's first heart attack is more likely to be fatal than a man's first heart attack.

Interestingly, a study presented at the American Heart Association's Asia Pacific Scientific Forum suggests different things may trigger sudden cardiac arrest in men and women. The study showed that in women psychosocial (emotional) stress may be a more common trigger for sudden cardiac arrest than physical exertion. Physical exertion is a more common trigger in men. In a study of 122 men and women who had suffered from cardiac arrest, forty percent of the women said they had experienced psychosocial stress caused by things such as divorce, death of a loved one or family conflicts, and only five percent reported physical exertion prior to their cardiac arrest. In contract, forty percent of the men reported physical stress and sixteen percent reported psychosocial stress prior to their cardiac arrest. The study's authors believe that while physical exertion may cause an increased level of adrenaline (a stress hormone that can cause rapid heart beats) in men, emotional stress may cause an increased level of adrenaline in women.

More research is needed to further clarify the potential differences between men and women suffering from heart diseases. Of course, another important goal is to stop heart diseases before they start. By eating a balanced diet, avoiding tobacco, exercising regularly and reducing stress both men and women can prevent heart diseases.

Discussion questions

1. Please summarize the article. What is the main point of the article?
2. Why is the incidence of heart diseases increasing around the world?
3. Are men's and women's hearts the same?
4. What are typical symptoms of a heart attack? What are atypical symptoms? Do men or women tend to present with atypical symptoms?
5. Is it possible that different things trigger sudden cardiac arrest in men and women?
6. What is psychosocial stress? How may it be related to sudden cardiac arrest?
7. How can heart diseases be prevented?

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http://www.americanheart.org/presenter.jhtml?identifier=3002347

Written by Sharon BeltrandelRio

Topic 6
When Spring is Around the Corner…So is Hay Fever Season
（春はすぐそこ 花粉症の季節です）

It's March and the weather is finally starting to get warmer. A patient visits the doctor complaining of sneezing, itchy eyes, a runny nose, and a sore throat. What's the diagnosis? It's most likely seasonal allergic rhinitis, also known as hay fever.

Seasonal allergic rhinitis is an allergy-related inflammation of the nasal passages, throat and eye membrane (conjunctiva) caused by exposure to pollen, dust or dander. Although hay fever in Japan is mainly caused by pollen from Japanese cedar and cypress trees, there are more than 40 kinds of plants throughout the country that produce pollen that causes hay fever. Usually Japan's hay fever season begins in mid-February, peaks in March, decreases at the end of April, and ends by mid-May. Hay fever affects Japanese people of all ages throughout the country. According to Kafun Joho Kyokai, a non-profit organization that monitors hay fever in Japan, one in five people in the Tokyo metropolitan area is affected by the pollen that causes hay fever.

Hay fever, like all allergies, is caused by an oversensitive immune system. It occurs when the immune system reacts to allergens (substances such as pollen, dust and dander) that are usually harmless. When pollen is inhaled by a person allergic to pollen, his or her immune system responds by producing antibodies, leading to the release of histamine. This causes itchy eyes, sneezing and mucus production. In severe cases it can also cause hives or rashes.

A variety of treatments for hay fever are available, including: antihistamines (short-acting and long-acting), corticosteroid nasal sprays, topical decongestants, comolyn sodium and hyposensibilization ('allergy shots'). The treatments have various side effects, therefore it is important to choose the appropriate medication based on each individual patient and the type and severity of the symptoms. The best treatment is prevention – on days when the outdoor pollen count is very high stay inside or wear a mask and goggles to avoid the allergens that cause hay fever.

Discussion questions

1. Please summarize the article. What is the main point of the article?
2. What is seasonal allergic rhinitis?
3. What causes seasonal allergic rhinitis?
4. When is hay fever season in Japan?
5. What are the symptoms of seasonal allergic rhinitis?
6. What treatments for hay fever are available?
7. Can hay fever be prevented? If so, how?

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Written by Sharon BeltrandelRio

Topic 7
Alzheimer's disease and Dementia:
Two More Reasons to Watch your Waistline
(ウエストラインに注意!)

Waistlines are increasing all over the world as people exercise less and consume more calories. The dangers of obesity and being over-weight in terms of heart disease, vascular disease and joint pain are well documented. But did you know that there may also be a link between obesity, dementia and Alzheimer's disease?

A study performed by researchers at the Karolinska Institute in Sweden found a direct link between obesity, dementia and Alzheimer's disease[1]. Researchers measured the body mass index (BMI), blood pressure and cholesterol levels of 1,449 middle-aged men and women. A follow-up exam was conducted twenty years later and the study participants' cognitive abilities were measured. Almost seventeen percent of those who were obese at middle age (BMI > 30) developed either Alzheimer's disease or dementia, compared to five percent for those of normal weight. After taking other risk factors such as high blood pressure and high cholesterol into account, the risk of Alzheimer's disease or dementia was still twice as high from being overweight alone.

The mechanism is not entirely understood, but the vascular problems associated with high blood pressure and cholesterol may affect the brain's ability to function. After all, the brain is one of the most active organs in the human body. The heart pumps about twenty percent of the body's blood to the brain, which uses about twenty percent of the blood's oxygen and fuel[2]. If the heart is not strong or if blood vessels are damaged the brain may not receive all the oxygen and fuel it needs.

More research is needed to better understand the link between Alzheimer's disease, dementia and obesity. In the meantime, people of all ages should maintain a healthy lifestyle by eating a balanced diet, exercising and refraining from tobacco. In addition to the well-documented benefits to the heart and vascular system, as well as the prevention of chronic diseases such as diabetes, maintaining a healthy weight may help preserve cognitive function.

Discussion questions

1. Please summarize the article. What is the main point of the article?
2. What are some of the dangers of being obese or over-weight?
3. What were the results of the long-term study performed at the Karolinska Institute?
4. Why might vascular problems affect the brain?
5. What are the benefits of maintaining a healthy lifestyle?
6. What advice would you give to someone who is trying to lose weight?

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Written by Sharon BeltrandelRio

Topic 8
Gastric Cancer in Japan
日本の胃癌事情

The good news is that gastric cancer incidence rates are decreasing in Japan, which means that a smaller percentage of the population is being diagnosed with stomach cancer. The bad news is that the absolute number of people with gastric cancer is increasing due to the rapid aging of the Japanese population.[1] However, there is more good news. In Japan, gastric cancer is usually diagnosed at an early stage, resulting in improving survival rates. In fact, although gastric cancer is five times more prevalent in Japan than in the West, mortality rates are lower in Japan.[2]

Stomach cancer, or gastric cancer, is the growth of cancer cells in the lining and wall of the stomach. Most stomach cancers start in the mucosa, the innermost layer of the stomach. About 90 to 95% of malignant tumors of the stomach are adenocarcinomas.[3] Other types of stomach cancer include lymphomas, sarcomas and other rare types. Surgery is the most common treatment for stomach cancer. Sometimes, especially in advanced cases, surgery may be combined with chemotherapy or radiation.[4]

There is much debate regarding the cause of stomach cancer. It is thought that a combination of hereditary and environmental factors play a part.[5] According to the National Cancer Institute in the United States, since 1930 the incidence of gastric cancer in the U.S. has decreased four-fold, to approximately seven cases per 100,000 people.[6] The reasons for this decrease are unknown but are believed to be related to improved food storage or dietary changes such as reduced salt intake. It is also believed that Japanese gastric cancer incidence rates are decreasing due to lifestyle and dietary changes, such as reduced salt use, increased consumption of fresh fruits and vegetables, and improved food storage.[7] Hopefully, these changes, as well as an avoidance of smoking, will lead to both a decrease in gastric cancer incidence rates and a decrease in the absolute number of Japanese diagnosed with stomach cancer.

Discussion questions

1. Please summarize the article. What is the main point of the article?
2. If the incidence of gastric cancer is decreasing in Japan, why is the absolute number of people with gastric cancer increasing?
3. What is the most common type of stomach cancer?
4. How is stomach cancer treated?
5. What causes stomach cancer?
6. Why is the incidence of stomach cancer decreasing in Japan?

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Written by Sharon BeltrandelRio

Topic 9
A Brief Look at Age-related Macular Degeneration
加齢(性)黄斑変性症

Age-related macular degeneration (AMD) is the leading cause of blindness in developed countries, and the third leading cause of visual impairment globally[1]. It affects people over the age of 50 and can lead to a significant decrease in quality of life and independence. Tasks such as driving, walking and reading can be greatly affected.

AMD affects the central field of vision and occurs when the central (or macular) retina develops degenerative lesions. There are two forms of AMD: "dry" and "wet".

- Dry AMD is characterized by drusen, or yellow deposits, in the macula. As the drusen grow in size and quantity they may lead to a dimming or distortion of vision. In more advanced stages a deterioration of the light-sensitive layer of cells in the macula leads to atrophy (cell death), causing patients to experience blind spots in the center of their vision or lose their central vision completely.

- Wet AMD is characterized by choroidal neovascularization, or growth of abnormal blood vessels from the choroid underneath the macula. These abnormal blood vessels grow toward the macula and leak blood and fluid into the retina, resulting in distortion (straight lines look wavy), blind spots and loss of central vision. Eventually these abnormal blood vessels scar, which leads to permanent central vision loss.

Dry AMD is more prevalent than wet AMD and vision loss is more gradual. Most patients with dry AMD will not lose central vision, however the dry form can lead to the wet form. People suffering from the wet form, about 10% of all people with AMD, are usually those who experience the most serious loss of vision[2].

The main risk factor for AMD is ageing. Researchers believe that other risk factors may include tobacco use, genetic tendencies, degree of eye pigmentation (light colored eyes are at greater risk), arterial hypertension, ultraviolet rays and eating a non-balanced diet[3].

Symptoms of AMD include distorted central vision, the appearance of dark and blurry areas or white out in the central vision, and diminished color perception. If patients experience any of these symptoms it is imperative that they see an ophthalmologist as soon as possible.

Prevention and treatment options are currently limited. Lasers, dynamic phototherapy and anti-angiogenesis drugs may retard AMD's progress, but early detection is very important. A recent study, AREDS (Age-Related Eye Disease Study), conducted by The National Eye Institute of the National Institutes of Health in the United States demonstrated that vitamins C, E, beta carotene, zinc and copper can decrease the risk of vision loss in people with intermediate to advanced dry macular degeneration[4]. Special aids that produce enlarged images of nearby objects may help those with impaired vision.

Scientists are currently searching for better ways to detect, treat and prevent vision loss in people with AMD. For example, they are studying submacular surgery and retinal translocation, which are surgical procedures to remove the abnormal blood vessels and rotate the macular center away from the abnormal blood vessels, respectively. In other studies, scientists are investigating the possibility of transplanting healthy cells into a diseased retina and researching certain anti-inflammatory treatments.

Written by Sharon BeltrandelRio

Discussion questions

1. Please summarize the article. What is the main point of the article?
2. Please describe AMD.
3. How does AMD affect patients' quality of life?
4. What are the symptoms of AMD?
5. What are the risk factors?
6. What options are available for treating AMD?
7. What types of treatments are scientists currently researching?

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Written by Sharon BeltrandelRio

Topic 10
The Human Skeleton
人間の骨格

When we think about the body's skeleton, we usually picture the bones, one of the human body's hardest, most durable substances. When we think about the bones' function in the human body, we usually assume that they are responsible for giving the body its shape, and protecting and supporting organs, tissues and other body parts.

However, the skeleton is much more dynamic than that. In addition to the functions listed above, bones repair and renew themselves constantly, and they are involved in the body's mineral balance. Bone is mostly (65%) made up of hard minerals such as calcium, phosphate, magnesium and other minerals; the other 35% is made of a soft protein called collagen[1]. Bones consist of two distinct structures: trabecular bone (which appears spongy-looking) is found on the inside, and is surrounded by cortical bone (a tough, dense outer layer) on the outside. The combination of hard and soft materials, plus the combination of structures, makes bones strong and flexible[2].

In addition to consisting of two types of materials and two types of structures, bones rely on two types of cells, osteoclasts and osteoblasts, both of which are scattered throughout the bones, for their constant renewal process. In this process, old or damaged bone is taken away and resorbed by the body and new, healthy bone takes its place. The osteoclasts break down the old bone, and then the osteoblasts put down the new bone[3]. Throughout childhood and into young adulthood (twenties), new bone formation surpasses bone resorption. However, after the age of thirty this process begins to reverse and bone resorption exceeds new bone formation. This means that people reach their peak bone mass by age thirty, after which bone density slowly begins to decrease[4]. For women, the rate of decrease in bone density accelerates after menopause due to the lack of estrogen. Men's bone density also diminishes, although at a slower rate, as testosterone levels decrease with age[5].

The skeleton also contributes to the body's mineral balance. The human body contains approximately 900 to 1800 grams of calcium, nearly 99 percent of which can be found in the teeth and skeleton[6]. Although the remaining one percent is a very small amount, it plays a critical role in functions such as blood clotting, nerve transmission and muscle contraction (including the heartbeat)[7]. The blood level of calcium is kept in a very narrow range, and when needed, bones release calcium.

Since people reach their peak bone mass by age thirty, it is important to build up as much bone as possible during childhood and the early adult years in order to prevent diseases such as osteoporosis (a disease in which the bones become thin and brittle, and as a consequence break easily). Peak bone mass depends about 80% on genetics and 20% on lifestyle factors (diet, exercise, habits); however, as mentioned above sexual hormones (estrogen and testosterone) are also a critical factor[8]. It is important that both children and adults receive adequate amounts of calcium and vitamin D. In addition, regular weigh-bearing exercise (such as walking, hiking, jogging, and dancing) is important for building and maintaining a strong skeleton. Finally, it is important to avoid tobacco use and limit alcohol intake[9]. Hopefully understanding the skeleton's important role in maintaining our health will motivate us to lead a healthy lifestyle!

Written by Sharon BeltrandelRio

Discussion questions

1. Please summarize the article. What is the main point of the article?
2. What is the role of the skeleton in the human body?
3. What does bone consist of and what is its structure?
4. What are osteoclasts and osteoblasts? What are their functions?
5. How do bones contribute to the body's mineral balance?
6. What factors determine peak bone mass?
7. What can be done to help ensure that bones develop properly and remain healthy?

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Written by Sharon BeltrandelRio

Topic 11
Osteoporosis: Not Just a Women's Disease
骨粗しょう症

Osteoporosis, which means "porous bones", is a disease in which the bones become thin and brittle, and as a consequence, break easily. It affects more than 200 million women world-wide, and approximately thirty percent of women over the age of 50 have one or more vertebral fractures during their lifetime[1]. But osteoporosis also affects men. One out of every five men over the age of fifty will suffer from an osteoporosis-related fracture during their lifetime[2]. More than 1.5 million osteoporosis-related fractures occur in men and women annually[3]. Most fractures occur in the spine, hip and wrist, and cause suffering, disability and a diminished quality of life. In fact, according to the International Osteoporosis Foundation, twenty percent of all patients die within one year after a hip fracture[4].

There is no single factor that causes osteoporosis, but a combination of genetic, dietary, hormonal, age-related and lifestyle factors contribute to its development[5]. Throughout childhood and the teenage years, the body develops new bone faster than existing bone is absorbed by the body. Bone mass peaks at about age thirty, then this process begins to reverse, and bone begins to be absorbed by the body faster than new bone is made. The volume of bone remains about the same, but its density decreases[6].

Low bone mass is the most important risk factor, and therefore sufficient calcium and vitamin D intake during childhood and young adulthood is critical to reaching peak adult bone mass[7]. Other risk factors include being female, having a small-boned frame, family history of osteoporosis, early estrogen deficiency, ethnic heritage (white and Asian women are at a higher risk than African-American and Hispanic women), and advanced age[8]. Although genetics determine the maximum amount of bone mass an individual can acquire, lifestyle habits such as eating a diet rich in calcium and vitamin D, exercising regularly, refraining from tobacco use and limiting alcohol consumption can help build and maintain bone mass[9].

Bone loss increases in women around menopause, when the ovaries decrease their production of estrogen. In men, bone loss increases when the production of testosterone decreases, at about 45 to 50 years of age[10]. However, since men tend to build more bone mass than women, they tend to get to osteoporosis later in life[11]. Most people do not experience symptoms in the early stages of osteoporosis. However, as the disease progresses, symptoms such as back pain, loss of height, a curved upper back and broken bones may occur.

Osteoporosis treatment includes the lifestyle habits mentioned above (eating a diet rich in calcium and vitamin D, exercising regularly, refraining from tobacco use and limiting alcohol consumption), but can also include medication to reduce bone loss and increase bone density. Biophosphates (for example, alendronate, ibandronate and risedronate), reduce the rate of bone loss and can be taken by men and women. Raloxine, a selective estrogen receptor modulator, reduces the rate of bone thinning and produces some increase in bone thickness, but it can only be taken by women (unlike estrogen, raloxine does not cause an increased risk of endometrial cancer). Calcitonin, a hormone that regulates calcium levels in the body, slows the rate of bone loss and can be taken by men and women. Finally, parathyroid hormone can be used for men and women with severe osteoporosis[12].

Written by Sharon BeltrandelRio

Discussion questions

1. Please summarize the article. What is the main point of the article?
2. What is osteoporosis?
3. Who is affected by osteoporosis?
4. What causes osteoporosis?
5. What are the symptoms of osteoporosis?
6. What can be done to prevent osteoporosis?
7. How can osteoporosis be treated?

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Written by Sharon BeltrandelRio

Topic 12
Arthritis: A Description of Three Common Disease Types
関節炎

Like many English words describing medical conditions, the word 'arthritis' comes from the Greek language: *arthro* means joint and *itis* means inflammation. There are more than 100 different types of arthritis, including osteoarthritis, rheumatoid arthritis and gout. Arthritis is a major cause of morbidity and significantly influences the health and quality of life of millions of people around the world. Approximately 40% of people over 70 years old suffer from osteoarthritis of the knee and 80% of people with osteoarthritis have some limitation of movement, including 25% that cannot perform major daily life activities[1]. In more than 50% of rheumatoid arthritis cases, the disease leads to the inability to work within ten years of onset[2].

The most common type of arthritis is osteoarthritis, which occurs when the cartilage covering the end of the bones gradually wears away. Osteoarthritis is sometimes called degenerative joint disease because it often occurs as the cartilage degenerates, or breaks down. The joints most commonly affected include the hips, knees and spine, all of which are weight bearing joints. The fingers, neck and large toe can also be affected[3]. Heredity (an inherited defect in one of the genes that makes cartilage, leading to more rapid deterioration of joints), obesity, injury and joint overuse may increase a person's risk of developing osteoarthritis[4]. The disease is usually treated by medication (e.g., pain-relievers such as acetaminophen and anti-inflammatory drugs, creams, steroids), exercise, hot and cold compresses to the painful joint, the use of supportive devices such as canes, and weight loss. When other treatment options have not been effective, surgery may be performed to relieve pain[5].

Rheumatoid arthritis, an autoimmune disease, occurs when immune cells migrate from the blood into the joints and produce substances that cause inflammation. This results in joint irritation, causing the cartilage to wear down, and the joint lining (synovium) to swell and produce fluid[6]. The joints become very painful, swollen and warm to the touch. Rheumatoid arthritis occurs in joints on both sides of the body; its symmetrical nature is one distinguishing factor from other types of arthritis. It occurs most commonly in the hands, wrists and knees. In rheumatoid arthritis, something seems to trigger the immune system to attack the joints. The exact cause is unknown, but a combination of genetic, environmental and hormonal factors are thought to play a role[7]. Treatments include medications (e.g., anti-inflammatory drugs and disease-modifying anti-rheumatic drugs that interfere with or suppress the immune system's attack on the joints), rest and exercise, and surgery to correct joint damage[8].

Gout, another common type of arthritis, occurs when the body cannot eliminate uric acid, a natural substance produced during the breakdown of RNA and DNA in cells. Foods such as red meats, organ meats (e.g., liver, kidney) and anchovies contain large amounts of uric acid. It usually dissolves in the blood, passes through the kidneys and leaves the body. Gout occurs when excess uric acid forms needle-like crystals in the joints, causing sudden, severe pain and tenderness, as well as swelling. It most often affects the big toe, knee and wrist joints[9]. Since heredity partly determines the kidney's ability to rid the body of uric acid, not everyone with high levels of uric acid will develop gout. Symptoms can often be treated and controlled, but there is no cure for gout. Treatments include NSAIDs (non-steroidal anti-inflammatory drugs), corticosteroids and colchicine[10].

Written by Sharon BeltrandelRio

Most types of arthritis can be managed, and the pain and disability minimized, with early diagnosis. To reduce the risk of developing arthritis and to prevent or slow joint damage, it is important to maintain a healthy weight, exercise regularly, use joint-protecting devices and techniques (e.g., proper lifting posture) and eat a healthy diet[11].

Discussion questions

1. Please summarize the article. What is the main point of the article?
2. Who is affected by arthritis?
3. What causes osteoarthritis?
4. What is rheumatoid arthritis?
5. What is gout?
6. Please describe the treatments for the types of arthritis in this article.
7. How can the risk of developing arthritis be reduced?

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Written by Sharon BeltrandelRio

Topic 13
How Long is Too Long?
日本の患者の平均入院日数は異常に長い？

In Japan, acute care* patients stayed in the hospital for an average of 20.7 days in 2003. In the U.S., the average length of stay was 5.7 days. The average length of stay in OECD countries** was 6.8 days.[1] Why did Japanese patients spend nearly three times as many days in the hospital compared to patients in other industrialized nations?

Of course the optimum length of a patient's stay depends on his or her injury or disease, and there are many factors to consider. However, similar differences in length of hospital stay were found in a study evaluating patients with the same condition, acute myocardial infarction. Data regarding patients admitted to teaching hospitals in the United States, Japan, Brazil, Germany and Switzerland were analyzed.[2] The average length of stay ranged from 7.7 +/- 4.3 days in the American hospital to 47.2 +/- 27.9 days in the Japanese hospital.[3] The researchers did not detect a difference in outcomes at one year. Although the U.S. hospital had the lowest prevalence of antero-septal myocardial infarction and the lowest use of thrombolytic therapy, the difference in average length of stay is noteworthy.

When Japanese researchers at the Hyogo Brain and Heart Center evaluated another specific condition, acute ischemic stroke, they found that the mean length of hospital stay for Japanese patients was 33 days, more than three times longer than in the United States.[4] They explained that the variation may be due to a difference in hospital type or healthcare systems. For example, in Japan stroke centers usually provide care for the acute and subacute phases of stroke. They also mention that the payment system may influence the length of stay. In a separate analysis involving ischemic stroke, Senior Economist Reiko Suzuki of the Japan Center for Economic Research attributes the difference to the abundant supply of beds in Japan and the fee-for-service system which allows hospitals and patients to use health services as much as they like.[5]

The cost of health care is increasing around the world. Governments will have to raise taxes or people will have to pay more out of their own pockets if current trends continue. In order to reform health care systems and decrease costs, it is important to understand the impact of current policies and provide patients with incentives to take care of themselves (e.g., maintain a healthy weight and refrain from using tobacco). Incentives should also be used to encourage health care professionals to provide high quality medical care at the lowest possible cost.

*Acute care includes all types of medical care, excluding long-term care. It includes rehabilitative care, palliative care and acute psychiatric care.

**OECD stands for Organization for Economic Cooperation and Development. It consists of 30 countries committed to democratic government and the market economy, including Australia, Austria, Belgium, Canada, Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Iceland, Italy, Ireland, Japan, Korea, Luxembourg, Mexico, Netherlands, New Zealand, Norway, Poland, Portugal, Slovak Republic, Spain, Sweden, Switzerland, Turkey, United Kingdom, and United States.

Written by Sharon BeltrandelRio

Discussion questions

1. Please summarize the article. What is the main point of the article?

2. What is the average length of time that acute care patients stay in the hospital in Japan, the U.S.? What is the average length of stay for patients in OECD member nations?

3. Were similar differences in the average length of hospital stay found when researchers studied specific diseases? Please describe the findings of the studies evaluating acute myocardial infarction and ischemic stroke.

4. Why do Japanese patients spend nearly three times as many days in the hospital compared to other industrialized nations?

5. Do you think that Japanese patients spend too many days in the hospital? Why or why not?

6. Do you think that American patients spend too few days in the hospital? Why or why not?

7. What can be done to decrease health care costs?

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Written by Sharon BeltrandelRio

Topic 14
Knee Replacement Surgery-- Part 1: A Technical Overview
膝関節移植手術①

Knee replacement surgery has become very common in the United States, and is becoming increasingly common around the world. According to the United States National Center for Health Statistics, the rate of knee replacement in the U.S. increased 70% during the period 1995-2004, for people 65 years and older.[1] An estimated 300,000 knee replacements are performed in the U.S. each year and the costs of knee replacement surgery totaled $11.9 billion in the United States in 2003.[2, 3]Equally important, the surgery has had a tremendous impact on improving the quality of life for thousands of people.[4]

The knee joint is one of the most important joints in the body, as well as the largest and most complex joint. It is a hingelike joint, formed where the femur (thighbone), tibia (shinbone) and patella (kneecap) meet. Two rounded protrusions at the end of the femur and two at the end of the tibia slide against each other, enabling the knee to bend. Cartilage, a smooth layer of tissue, covers the protrusions so that the femur and tibia move smoothly against each other. The remaining surfaces are covered by synovial membrane, a thin, smooth tissue that releases a special fluid to lubricate the knee and reduce friction. The patella is a thick flat triangular bone that protects the front of the joint and increases the leverage of the quadriceps (thigh muscle). Stability is provided by large ligaments attached to the femur and tibia, and the quadriceps gives the knee strength.

Infection, injury and disease can result in knee pain and stiffness. Ninety-seven percent of all knee replacements are performed due to osteoarthritis.[5] Osteoarthritis causes swelling of the joints and friction between the cartilage and bones. The friction causes the cartilage and bones to break down, and then the bones begin to move against each other, resulting in pain and loss of movement. Knee replacement surgery is performed when medication and walking aids no longer provide relief. In knee replacement surgery, the roughened ends of the femur and tibia, as well as the underside of the patella, are replaced with a knee prosthesis. The prosthesis is made of metal (usually titanium, stainless steel or cobalt) and polyethylene, a type of plastic. The prosthesis is held in place by special cement and the bone growing into the prosthesis. The complication rate after knee replacement surgery is low, about 2 percent.[6]

Knee replacement surgery, first performed in 1968, is one of the most important orthopedic surgical advances of the twentieth century.[7] Knee replacement techniques, prostheses and care have improved significantly during the past few decades. In the future, the prevalence of knee replacement surgery is expected to increase due to the aging population and increasing trends in overweight and obesity.

Written by Sharon BeltrandelRio

Discussion questions

1. Please summarize the article. What is the main point of the article?
2. How many knee replacements are performed in the U.S. and what are the total costs?
3. Please describe the knee joint.
4. How does the knee joint work? Why is the knee an important joint?
5. Why is knee replacement sometimes required?
6. Please describe knee replacement surgery.
7. Why is the prevalence of knee replacement increasing?

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Written by Sharon BeltrandelRio

Topic 15

Knee Replacement Surgery-- Part 2: A Patient's Perspective
膝関節移植手術②

In the U.S., when a physician recommends knee replacement surgery, he also provides the patient with a pre-surgery strengthening program. This program consists of a series of exercises that the patient can do at home to strengthen the muscles surrounding the knee and to improve overall fitness. The patient's general health is checked by physicians on an out-patient basis, and he (or she) arrives at the hospital the day of the surgery. Knee replacement surgery takes approximately one to two hours. Immediately after the surgery, foot and ankle movement is encouraged to increase blood flow and prevent swelling and blood clots in the leg. In addition, many patients use a continuous passive motion (CPM) machine, which is designed to gently bend and straighten the knee. Physical therapy begins the day after surgery.

Most patients spend three or four nights in the hospital, by which time they are able to walk with a walking aid (a walker or crutches). When patients are discharged they usually go home, although some patients go to a rehabilitation center. A nurse visits patients at home two or three times during the first week and once or twice during the second week. The nurse checks the patient's general condition, heart and blood, and closely inspects the knee to ensure that it is healing properly. A physical therapist visits three times a week for about four weeks. Physical therapy enables the patient to gradually increase the new knee's strength and flexibility. The patient should perform physical therapy exercises, an extremely important part of the healing process, at least three times a day, after which ice must be applied to the knee to reduce swelling.

A variety of medications are used throughout the surgery and recovery periods. Usually general anesthesia is used during the surgery. After surgery, physicians choose the most appropriate pain control medicine based on the patient's needs (I.V.'s, pills or injections). Anti-inflammatory drugs such as celecoxib and anti-coagulants such as warfarin may also be prescribed. The patient performs respiratory exercises to prevent lung congestion and is encouraged to eat a nutritious diet. Protein, zinc, fluids, calcium, iron, vitamin A and vitamin C are especially important to the healing process. By eating a healthy diet and diligently doing physical therapy the patient can usually resume his normal daily activities within a short period, and his quality of life greatly improves due to his increased mobility and decreased pain.

Discussion questions

1. Please summarize the article. What is the main point of the article?
2. How do patients prepare for surgery?
3. What happens after the surgery?
4. Why is physical therapy important?
5. What medications are used during knee replacement surgery and the recovery period?
6. What should a patient do to ensure a full recovery?
7. Are there any differences between knee replacement surgery as described in this article and as performed in Japan? What are they?

Written by Sharon BeltrandelRio

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Written by Sharon BeltrandelRio

Topic 16
An introduction to Type 2 Diabetes
2型糖尿病

"Diabetes is a major threat to global public health that is rapidly getting worse, and the biggest impact is on adults of working age in developing countries. At least 171 million people worldwide have diabetes. This figure is likely to more than double by 2030 to reach 366 million."

-- World Health Organization[1]

Diabetes mellitus is a serious disease that can be life threatening. In 2000, nearly 6.8 million Japanese suffered from diabetes, and this number is expected to increase to nearly 8.9 million by 2030.[2] Diabetes is a chronic disease in which the pancreas cannot produce enough insulin or the body cannot use the insulin it produces effectively. Over time, diabetes, especially uncontrolled diabetes, can lead to serious damage of the nerves, blood vessels and other areas. According to the World Health Organization, almost three million people worldwide die annually due to diabetes.[3]

Diabetes comes from the Greek word meaning 'passing through' or 'siphon' and refers to one of the disease's major symptoms: excessive urine production. Mellitus comes from the Latin word meaning 'sweet taste' and refers to the sweetness of the urine. There are three main types of diabetes: Type 1, Type 2 and gestational diabetes. This article focuses on Type 2 diabetes (subsequent articles will focus on the other types).

Ninety percent of the people with diabetes suffer from Type 2 diabetes (formerly called non-insulin-dependent or adult-onset diabetes), in which the body cannot effectively use insulin.[4] Insulin, a hormone produced in the pancreas, regulates carbohydrate metabolism, has effects on fat metabolism and impacts the liver's activity in storing or releasing glucose and in processing blood lipids.[5] In patients with Type 2 diabetes, since the body cannot effectively use insulin, blood glucose levels increase and over time damage the heart, blood vessels, eyes, kidneys and nerves.

The symptoms of Type 2 diabetes include polydipsia (thirst), polyuria (excessive urination), constant hunger, weight loss, vision changes and fatigue.[6] Type 2 diabetes is largely the result of excess body weight and lack of exercise, although genetic factors may also increase a person's susceptibility.

Initial treatment of Type 2 diabetes includes diet and exercise, and even moderate weight loss can result in a significant improvement. Oral antidiabetic drugs such as sulfonylureas, biguanides (metformin) and thiazolidinedines are often used to treat Type 2 diabetes. One of the newest treatments, exanatide, is an incretin mimetic. Incretins such as GLP-1 (glucagon-like peptide-1) enhance glucose-dependent insulin secretion and have other antihyperglycemic actions following their release into the circulation from the gut.[7] Exanatide (Byetta) is an injectable medicine used to improve glucose control. There is no cure for Type 2 diabetes, but it can be prevented by maintaining a healthy weight, exercising regularly and eating healthy foods.

Written by Sharon BeltrandelRio

Discussion questions

1. Please summarize the article. What is the main point of the article?
2. What is diabetes?
3. How many people suffer from diabetes?
4. What causes diabetes?
5. Why do you think the incidence of diabetes is increasing so rapidly?
6. What medications are used to treat diabetes?
7. How can diabetes be prevented?

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Written by Sharon BeltrandelRio

Topic 17
An introduction to Type 1 Diabetes
1型糖尿病

Type 1 diabetes is an autoimmune disease that affects approximately one of every 250 Americans.[1] Japan has one of the lowest incidence rates of Type 1 diabetes in the world, averaging 2.37 cases per 100,000 persons in children aged 0-14.[2]

Usually insulin is secreted by the pancreas in small amounts. However, after a meal, glucose from the food stimulates the pancreas to release insulin in an amount based on the size of the meal. Once insulin has transported the glucose to the body's cells and the amount of glucose in the blood has decreased, the beta cells in the pancreas reduce the amount of insulin secreted to avoid hypoglycemia (low blood glucose levels). In Type 1 diabetes, the body's immune system destroys the beta cells (which are responsible for producing insulin) in the pancreas. This results in a complete lack of insulin. Without insulin, the body cannot move nutrients, especially glucose, into the body's cells where the nutrients are used as a source of energy to function, and the entire process breaks down.

Researchers are not sure what causes Type 1 diabetes. There is a genetic component that makes certain people susceptible, but scientists also believe that an environmental trigger plays a role in causing the disease. It appears that something in the environment, perhaps a toxin or a virus, tricks the immune system into mistakenly destroying the beta cells. Autoantibodies, markers of the destruction, can be seen in 85 to 90 percent of people with Type 1 diabetes when their blood glucose levels are high.[3]

The symptoms of Type 1 diabetes include polydipsia (thirst), polyuria (excessive urination), increased hunger, dry mouth, nausea, unexplained weight loss and fatigue. Currently it is not possible to prevent diabetes, and there is no cure. People with Type 1 diabetes inject insulin to maintain their blood glucose levels within the normal range. Exubera (insulin human [rDNA origin]), the first inhaled insulin, was approved by the U.S. Food and Drug Administration in 2006. It is a short-acting insulin designed to be taken just before meals, and is usually used in combination with longer-acting injected insulins. Other forms of insulin, such as mouth sprays and topical applications (e.g., patches), are also in development.

When blood glucose levels are not well controlled, retinopathy, nephropathy (kidney damage) and neuropathy (damage to nerves) can result. However, with effective meal planning, exercise and intensive insulin therapy, many people with Type 1 diabetes live long and healthy lives.

Written by Sharon BeltrandelRio

Discussion questions

1. Please summarize the article. What is the main point of the article?
2. What is the prevalence of Type 1 diabetes?
3. What is Type 1 diabetes?
4. What causes Type 1 diabetes?
5. How is Type 1 diabetes treated?
6. What are the potential long-term effects of Type 1 diabetes?
7. How can the potential long-term effects of Type 1 diabetes be avoided?

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Written by Sharon BeltrandelRio

Topic 18
The Mind's Effect on the Body: The Placebo Effect and White Coat Syndrome
プラシーボ効果及び白衣高血圧症

According to the American Heritage Science Dictionary, a placebo is a substance containing no medication that is used as a control in a clinical research trial to determine the effectiveness of a potential new drug.[1] Those receiving the placebo sometimes get better, a phenomenon known as the placebo effect. Although doctors and researchers have known about the placebo effect for a long time, it is not well understood.

Professor Fabrizio Benedetti of the University of Turin in Italy has shown that a saline placebo can reduce tremors and muscle stiffness in people with Parkinson's disease.[2] When measuring the activity of neurons in patients' brains during the administration of saline, they found that individual neurons in the subthalamic nucleus (the part of the brain that is sometimes a target when using surgery in an attempt to relieve Parkinson's symptoms) had the desired affect of firing less often when the saline was given. The neuron activity decreased at the same time as the symptoms improved.

However, it appears that the placebo effect can be either positive or negative and depends on the activities surrounding the medical treatment. In a study performed by Ted Kaptchuk (Assistant Professor of Medicine, Harvard Medical School) et al, researchers compared two placebo treatments: a sham device and inert pills.[3] The researchers recruited 270 volunteers suffering from chronic arm pain due to repetitive use that had lasted at least three months despite treatment and who scored three or more on a ten-point scale. The patients were randomized to receive either acupuncture with a sham device (trick needles whose tips retract so they don't penetrate the skin) twice a week for six weeks or blue cornstarch pills once a day for eight weeks. Twenty-five percent of the acupuncture group experienced side effects from the nonexistent needle pricks, including 19 people who experienced pain and four people whose skin became red or swollen. In the cohort taking the sugar pill, 31 percent experienced side effects including dizziness, restlessness, rashes, headaches, nausea and nightmares. Dry mouth and fatigue were the most common complaints, and 3 patients withdrew from the study after reducing the dosage failed to control their symptoms. The side effects reported by the participants exactly matched those described by the physicians when the patients joined the study.

At the end of the study, the patients receiving the fake acupuncture (sham device) reported that their pain decreased an average of 2.64 points on the ten-point scale and those taking the sugar pills said their pain decreased an average of 1.5 points.[4] In other words, the sham device had a greater effect than the placebo pill on self reported pain. The researchers believe that the difference may be due to the activities surrounding the medical treatment; performing acupuncture is more elaborate than prescribing pills.

Another phenomenon that illustrates how the mind can affect the body is known as "white coat syndrome" or "white coat hypertension". These terms refer to the situation in which blood pressure measured in a physician's office is consistently higher than when measured at home or at work. Studies suggest that ten to twenty percent of patients may experience white coat syndrome.[5] It is believed that white coat syndrome or white coat hypertension is due to the anxiety that some people experience during visits to a physician's office.

Written by Sharon BeltrandelRio

The placebo effect and white coat syndrome are just a couple of phenomena that demonstrate how the mind can affect the body. Researchers have a lot to learn regarding these effects, including their causes, mechanisms of action and how to take advantage of the potential positive nature of the placebo effect.

Discussion questions

1. Please summarize the article. What is the main point of the article?
2. What is a placebo and what is the placebo effect?
3. How did treatment with saline solution affect Parkinson's disease patients?
4. What happened when researchers compared two placebos?
5. What do you think causes the placebo effect?
6. What is white coat syndrome?
7. What do you think causes white coat syndrome?

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Written by Sharon BeltrandelRio

Topic 19
Counting Sheep: The Importance of a Good Night's Sleep
不眠症治療の現状

Mike, a 37-year-old male, considered himself healthy. He exercised moderately two or three times a week, but since he worked for a large financial corporation he spent long hours at his desk and frequently dined with customers. As a result of his sedentary lifestyle and rich diet, his BMI was 28.6*. He presented at his doctor's office complaining of lethargy and sleepiness during the day. In addition, he often had headaches in the morning and his wife mentioned that he had begun to snore loudly.

The physician ordered a polysomnogram, or PSG, to record Mike's brain activity, eye movement, muscle activity, breathing and heart rates, lung function and the percentage of oxygen in his blood throughout the night. After studying the test results, the physician diagnosed Mike with obstructive sleep apnea, the most common type of sleep apnea. The number of people in the west suffering from obstructive sleep apnea has increased in line with increased levels of obesity, as well as improved awareness and diagnosis[1].

Sleep apnea occurs when a person regularly stops breathing for ten seconds or longer during sleep. It ranges from mild to severe, depending on the number of times in an hour that apnea (breathing stops) and/or hypopnea (breathing becomes very slow) occur. Obstructive sleep apnea is caused by a blockage or narrowing of the airways in the nose, mouth or throat. Factors that cause sleep apnea include: obesity, large tonsils and adenoids, throat muscles and tongue that relax more than normal, and a bony structure of the head and neck that result in a somewhat smaller airway size in the mouth and throat area[2].

Sleep apnea disrupts sleep and reduces its quality. It may result in many brief drops in the blood's oxygen levels and interrupts "sleep architecture" or sequence of stages. Healthy sleep normally begins with about eighty minutes of non-rapid eye movement, or NREM, when brain activity and bodily functions slow down. Each NREM stage is followed by about ten minutes of rapid eye movement, or REM, during which brain and body activity increase. REM is the stage during which dreams occur. This ninety-minute cycle is repeated four to six times each night[3]. A good night's sleep (seven to eight hours) enables people to function both mentally and physically. During sleep, the body secretes growth hormone, which promotes the repair and regeneration of tissues throughout the body[4].

There are a variety of treatments for obstructive sleep apnea, and treatment often helps associated medical problems such as high blood pressure, as well as reduces the risk for heart attack and stroke[5]. Mild cases of obstructive sleep apnea can be treated with lifestyle changes, such as: losing weight; avoiding alcohol, smoking and medicines that cause drowsiness; and by sleeping on one's side. Moderate cases are usually treated with continuous positive airway pressure (CPAP), in which a mask blows air into the throat at a pressure level that keeps the throat open during sleep. Surgery to remove the tonsils and adenoids, or surgery to treat obesity is performed in serious cases. In Mike's case, CPAP proved to be an effective treatment.

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* Underweight = <18.5, Normal weight = 18.5-24.9, Overweight = 25-29.9, Obesity = BMI of 30 or greater

Written by Sharon BeltrandelRio

Discussion questions

1. Please summarize the article. What is the main point of the article?
2. Describe Mike's symptoms and the physician's diagnosis.
3. What is obstructive sleep apnea?
4. What causes obstructive sleep apnea?
5. Why is the incidence of sleep apnea increasing?
6. What is "sleep architecture"?
7. Why is it important to sleep seven to eight hours every night?
8. How can sleep apnea be treated?

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Written by Sharon BeltrandelRio

Topic 20
Chronic Obstructive Pulmonary Disorder (COPD)
慢性閉塞性肺疾患

COPD has traditionally been described as the combination of two manifestations: parenchymal destruction (emphysema) and small airway disease (obstructive bronchitis). Emphysema is characterized by damaged lung tissue and alveoli (tiny air sacs) at the end of the airways, causing air to be trapped in the lungs and leading to shortness of breath[1]. Bronchitis is characterized by inflammation in the bronchial tubes, making it difficult to breathe, and at times a chronic cough that brings up sputum (mucus)2. Recently the Global Initiative for Obstructive Lung Disease (GOLD) Workshop Report defined COPD as a disease characterized by airflow limitation that is not fully reversible[3]. In view of common clinical observations in Japan, the new definition acknowledges that some patients can develop significant airflow limitations without the classic symptoms of chronic cough and sputum production.

COPD is a chronic disease that develops over many years. It is most often caused by smoking, and 80-90% of people with COPD have been long-term smokers[4]. It is believed that long-term inhalation of lung irritants such as industrial dust and chemical fumes may also lead to COPD. Due to changes in smoking habits, the prevalence of the disease is expected to increase over the next twenty years in the United States and Europe, and then reach a plateau. In Japan and Asia, the disease prevalence is expected to continue increasing for the next 40 years. For example, a survey found that in China, the average daily consumption of tobacco per person increased from one cigarette in 1952 to ten cigarettes in 1990, a rate similar to that found in the U.S. in the 1950's[5]. In Japan, the estimated total cost of COPD is more than 805 billion yen per year, imposing a high economic burden on the Japanese healthcare system[6].

Early diagnosis and treatment greatly determine the outcome for COPD patients. The disease can only be reliably diagnosed through a medical history and lung function tests (e.g., spirometry). There is no cure for COPD, but steps can be taken to manage the disease. The only way to slow the progression of the disease is to stop smoking. Medications such as anticholinergics (ipratropium, tiotropium), inhaled corticosteroids and beta-agonists, as well as ventilators and oxygen therapy may make it easier to breathe[7]. COPD is a progressive disease and may be complicated by a COPD exacerbation (sudden and prolonged increase in symptoms including shortness of breath, cough and sputum production). COPD exacerbations may be life-threatening and may require immediate treatment. In addition, cor pulmonale (heart failure that affects the right side of the heart) frequently occurs in COPD patients[8].

Written by Sharon BeltrandelRio

Discussion questions

1. Please summarize the article. What is the main point of the article?
2. What is COPD?
3. How has the definition of COPD changed? Why?
4. What causes COPD?
5. Explain the difference in prevalence in Asia, the United States and Europe. What causes this difference?
6. How is COPD treated?
7. What is the best way to prevent COPD?

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Written by Sharon BeltrandelRio

Topic 21
Schizophrenia -Part one-
統合失調症①

Schizophrenia is a psychotic brain disorder characterized by distortions in the way a person perceives reality, thinks, acts, expresses emotions and relates to others. According to the World Health Organization, an estimated 24 million people worldwide suffer from schizophrenia; it affects about seven people per thousand of the adult population, mostly in the age group 15-35 years[1]. Approximately 260,000 people with schizophrenia were treated every day in 1999 in Japan, and 202,012 were admitted to a mental hospital in 2002[2].

The symptoms of schizophrenia can be classified into three categories[3] Positive symptoms include unusual thoughts or perceptions, such as hallucinations, delusions, thought disorder and movement disorder. Negative symptoms are characterized by a loss or decrease in the ability to speak, express emotion, initiate plans or find pleasure in everyday life. Cognitive symptoms include problems with attention, memory and the functions that enable us to plan and organize. There are four basic subtypes of schizophrenia[4]. In paranoid schizophrenia, patients are preoccupied with delusions of being persecuted or punished. However, their thinking, speech and emotions may remain reasonably normal. In disorganized schizophrenia, patients are often confused and incoherent, with jumbled speech, and their behavior may be emotionless or inappropriate. They often demonstrate disorganized behavior that may disrupt their ability to perform daily activities. In catatonic schizophrenia, patients are immobile and unresponsive. They may also have peculiar movements or display bizarre postures. Undifferentiated schizophrenia is diagnosed when the patient's symptoms do not clearly represent one of the other subtypes.

Schizophrenia varies in severity from person to person. Psychotic episodes occur when a person loses touch with reality, causing a sudden change in personality and behavior. Some people have only one psychotic episode, while others may experience many episodes, although it is possible for them to lead relatively normal lives between episodes. The symptoms of schizophrenia seem to worsen and improve in cycles (relapses and remissions)[5].

Part two of this article will describe schizophrenia's potential causes and treatments.

Written by Sharon BeltrandelRio

Discussion questions

1. Please summarize the article. What is the main point of the article?
2. What is schizophrenia?
3. How many people suffer from schizophrenia?
4. What are the symptoms of schizophrenia?
5. What are the subtypes of schizophrenia?

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Written by Sharon BeltrandelRio

Topic 22
Schizophrenia -Part two-
統合失調症②

As described in “Schizophrenia (Part one)”, schizophrenia is a psychotic brain disorder characterized by distortions in the way a person perceives reality, thinks, acts, expresses emotions and relates to others. This article describes schizophrenia’s potential causes and treatments.

It is believed that schizophrenia is caused by a combination of environmental and genetic factors[10]. Approximately one percent of the general population has schizophrenia, but it is seen in ten percent of those with a first-degree relative (parent, brother or sister) with the disorder[2]. People who have a second-degree relative (aunt, uncle, grandparent or cousin) with schizophrenia also develop the disorder more often than the general population[3]. Recently scientists from the Massachusetts Institute of Technology in the United States and RIKEN Brain Science Institute in Japan reported that the PPP3CC and other genes in the early growth response (EGR) gene family (specifically, EGR3) may be linked to the disease[4]. These genes are important in the signaling pathway for calineurin, a brain enzyme that plays a role in many neuronal functions whose disruption may lead to the disorganized thinking, attention deficits, and memory and language problems symptomatic of schizophrenia.

Scientists believe that an imbalance in certain complex, interrelated chemical reactions in the brain involving neurotransmitters such as dopamine, glutamate and possibly others plays a role in schizophrenia[5]. It is believed that several genes are associated with an increased risk of schizophrenia; however it is likely that environmental factors also contribute to the disorder. Researchers believe that factors such as exposure to viruses or malnutrition in the womb, problems during birth, and psychosocial factors such as stressful environmental conditions may play a role in the development of schizophrenia[6].

Schizophrenia treatment focuses on eliminating the symptoms, since the disease’s causes are still unknown. Antipsychotic drugs are available, but everyone reacts differently and sometimes several different medications must be tried before the most effective one is found. Atypical antipsychotics, developed in the 1990’s, have overcome many of the side effects such as rigidity, muscle spasms, tremors and restlessness traditionally associated with antipyschotics[7]. However, they may cause weight gain and metabolic changes. Psychosocial treatment may also be effective in patients who are taking antipsychotic drugs and are in stable condition.[viii] Illness management skills, cognitive behavior therapy, family education skills and self-help groups may help patients deal with certain aspects of schizophrenia such as difficulty with communication, motivation, work and maintaining relationships with others. It is very important to understand that schizophrenia is a chronic disease that requires constant management.

Due to recent advances in schizophrenia research, the ambiguity of the old term and the entrenched negative image of schizophrenia, the Japanese Society of Psychiatry and Neurology changed the Japanese term for the disease from “Seishin Bunretsu Byo” (mind-split-disease) to “Togo Shitcho Sho” (integration disorder) in 2002.[ix] The new term refers to the vulnerability-stress model, and it implies that the disorder may be treated and that recovery is possible if advanced medications and psychosocial intervention is used.

Written by Sharon BeltrandelRio

Discussion questions

1. Please summarize the article. What is the main point of the article?
2. What causes schizophrenia?
3. What genes may be related to schizophrenia?
4. What types of drugs are used to treat schizophrenia?
5. What is psychosocial treatment?
6. Why was the Japanese term for schizophrenia changed?

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(Accessed 26 July 2007)

Written by Sharon BeltrandelRio

Topic 23
Autism
自閉症

Autism is a developmental disorder characterized by impaired social interaction, problems with verbal and nonverbal communication, and unusual, repetitive or severely limited activities and interests[1]. Although it was once reported as a rare disorder, according to the U.S. Centers for Disease Control and Prevention, autism now affects one in every 150 children in the United States[2]. One reason for the increase may be that in the past, only the most severe forms of the disease were reported[3]. The various types of autism (ranging from mild to severe) are now better defined and awareness has increased substantially.

The potential causes of autism are intensely debated. Some researchers believe that it is caused by a genetic mutation. Others believe that childhood vaccines or environmental toxins may be involved. It has been suggested that the measles, mumps and rubella vaccine (MMR) may cause autism. However, studies (including several performed in Japan, which used the MMR vaccine between 1989 and 1993) show that the withdrawal of the MMR vaccination has had no effect on the incidence of autism and is most unlikely to be a main cause of autism[4,5].

Autism ranges from a mild to severe affliction. For example, people with Asperger syndrome (one type of autism), demonstrate normal language development but odd behaviors amenable to change[6]. Severe autism involves developmental disorders that severely impair people for life.

The hallmark of autism is impaired social interaction[7]. Babies with autism may be unresponsive and focus intently on one object for long periods of time. Children may fail to respond to their name, have difficulty interpreting what others are thinking or feeling due to their inability to understand social cues (e.g., facial expressions and tone of voice), and lack empathy. Many children with autism demonstrate repetitive movements such as rocking or self-abusive behavior such as biting or head-banging. In addition, they may have a reduced sensitivity to pain, yet be abnormally sensitive to sensory stimulation such as sound or touch. Since autism varies widely in its severity and symptoms, doctors rely on a core group of behaviors related to the characteristics described above to diagnosis the disease. Furthermore, it is a very complex affliction and a comprehensive evaluation may involve a psychologist, neurologist, psychiatrist, speech therapist and other professionals. It is important to rule out hearing disorders that may cause behavior that could be mistaken for autism (e.g., delayed speech development).

Autism does not have a cure[8]. Behavioral interventions and therapies are designed to remedy specific situations and can be very effective. Interventions and therapies target the core symptoms of autism, including impaired social interaction, verbal and nonverbal communication problems, and obsessive or repetitive routines. Most professionals agree that the earlier that the intervention begins, the better. Anti-depressants and anti-psychotic medications are sometimes prescribed (especially to treat severe behavioral problems).

Written by Sharon BeltrandelRio

Discussion questions

1. Please summarize the article. What is the main point of the article?
2. What is the incidence of autism?
3. What do some researchers believe is causing the increased incidence of autism?
4. What causes autism?
5. What are the symptoms of autism?
6. How is autism diagnosed?
7. How is autism treated?

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Written by Sharon BeltrandelRio

Topic 24
Depression
うつ病

Depressive disorders are illnesses that involve the body, mood and thoughts[1]. Everyone feels sad sometimes; this is a natural response to loss and to life's challenges and disappointments. However, if the feeling of sadness becomes intense, lasts for a long period of time and prevents a person from leading a normal life, it is a depressive disorder and one of several depressive illnesses.

According to a report from the U.S. National Institutes of Mental Health, nearly 18.8 million American adults suffer from major depression[2]. Furthermore, suicide, which is closely linked to depression, is the third leading cause of death in people aged 10 to 24 years old. Older Americans are also affected by depression and suicide. Although people aged 65 and older comprise only 12 percent of the U.S. population, they accounted for 16 percent of suicide deaths in 2004[3]. Surprisingly, studies show that many older adults (up to 75 percent) who committed suicide visited a physician within a month prior to death[4]. Depression is not always recognized and left undiagnosed and untreated, it can worsen, lasting for months or years and causing untold suffering.

There are several types of depressive disorders, and within each type there are variations in the severity and persistence of the symptoms. Major depression may involve a variety of symptoms such as a persistent sad or anxious mood, pessimism, feelings of guilt or helplessness, loss of interest in activities that were once enjoyed, fatigue, insomnia, loss of appetite or overeating, thoughts of death/suicide and restlessness, as well as persistent physical symptoms such as headaches that do not respond to treatment[5]. The symptoms of major depression are disabling and interfere with a person's ability to work, study, sleep, eat and enjoy activities that were once pleasurable.

Dysthymia, a less severe type of depression, is manifested by long-term, chronic symptoms that do not disable as in major depression. However, the symptoms of dysthymia prevent a person from functioning well or from feeling good. Furthermore, people with dysthymia often experience major depressive episodes throughout their lives[6].

Bipolar disorder is not nearly as prevalent as other types of depression, and it is characterized as a manic-depressive illness. People with bipolar disorder suffer from cycling mood changes: mania (severe highs during which the individual may be overactive and have a great deal of energy) and depression (lows during which the individual has the symptoms of a depressive disorder).

Major depressive disorder is often associated with changes in brain function or brain structures[7]. Some types of depression, including bipolar disorder, run in families, suggesting that hereditary factors may play a role. However, other factors such as stress may also be a factor. Physical changes in the body such as stroke, heart attack, cancer, Parkinson's disease and hormonal disorders may be accompanied by mental changes such as depression. Often, a combination of genetic, psychological and environmental factors is involved in the inception of a depressive disorder[8].

Written by Sharon BeltrandelRio

Depressive disorders are often treated with a combination of antidepressant medications and psychotherapies. Medications include selective serotonin reuptake inhibitors (SSRIs), tricyclics and monoamine oxidate inhibitors (MAOIs). Usually, they must be taken regularly for three to four weeks before the full therapeutic effect occurs. Once the individual feels better, the medication must be taken for at least four to nine months to prevent a recurrence[9] Treatment is available for people suffering from depressive disorders. The first step is to seek help and obtain an appropriate diagnosis.

Discussion questions

1. Please summarize the article. What is the main point of the article?
2. What is a depressive disorder?
3. How many people suffer from depressive disorders in the U.S.?
4. What are some of the most different types of depressive disorders?
5. What causes depressive disorders?
6. How are depressive disorders treated?

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Written by Sharon BeltrandelRio

Topic 25
Metabolic Syndrome
メタボリック症候群

Metabolic syndrome, also known as Syndrome X, is not a disease. The term refers to a group of risk factors that increase a person's chance for heart disease, diabetes, stroke and other health problems. For example, people with metabolic syndrome are twice as likely to develop heart disease and five times as likely to develop diabetes compared to people without metabolic syndrome[1].

The American Heart Association and the U.S. National Heart, Lung, and Blood Institute define metabolic syndrome as the presence of three or more of the following components[2]:

- Elevated waist circumference (men: ≥ 102 cm, women: ≥ 88 cm)
- Elevated triglycerides (≥ 150 mg/dL)
- Reduced HDL cholesterol (men: ≤ 40 mg/dL, women: ≤ 50 mg/dL)
- Elevated blood pressure (≥ 130/85 mm Hg)
- Elevated fasting glucose (≥ 100 mg/dL)

Despite the high prevalence of metabolic risks in Asians, obesity is relatively low. Therefore, it has been suggested that a waist-to-height (W/Ht) ratio ≥ 0.5 is a more effective index than waist circumference in identifying metabolic syndrome[3]. Similarly, although the World Health Organization (WHO) defines obesity as body mass index (BMI) > 30.0 kg/m2, researchers have proposed that obesity in Japanese be defined as BMI > 25.0 kg/m2 based on studies evaluating high risk groups for cardiovascular disease in Japan[4].

According to the Japanese Health, Labor and Welfare Ministry, an estimated 13 million people in Japan suffer from metabolic syndrome and another 14 million are estimated to be at risk of getting it[5]. In the U.S., the National Institutes of Health's National Heart, Lung and Blood Institute reports that 47 million Americans, or nearly one out of six people, have metabolic syndrome[6].

Metabolic syndrome is closely linked to people who are overweight or obese and to a lack of physical activity. Insulin resistance, a condition in which the body does not use insulin properly, is another cause. It is believed that genetics and older age are other important underlying causes[7].

Metabolic syndrome can be prevented or delayed with lifestyle changes such as exercising regularly, eating a healthy diet, losing weight and avoiding tobacco. Sometimes the individual components of metabolic syndrome are treated with blood pressure, cholesterol and/or diabetes medications[8].

Written by Sharon BeltrandelRio

Discussion questions

1. Please summarize the article. What is the main point of the article?
2. What is metabolic syndrome?
3. Should the same definitions of elevated waist circumference and obesity apply to Americans and Asians? How should obesity be measured in Japan?
4. How many people have metabolic syndrome in Japan? In the U.S.?
5. What causes metabolic syndrome?
6. How can metabolic syndrome be prevented?
7. Is it possible to treat metabolic syndrome?

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Written by Sharon BeltrandelRio

Topic 26
Traumatic Brain Injury (Part 1)
外相性脳損傷

Traumatic brain injury (TBI) can affect anyone at any age. Males aged 15 to 24 are vulnerable due to their tendency towards a high-risk lifestyle. Young children and people over 75 years old are susceptible to head injuries caused by falling. Violent shaking of an infant can also cause brain injury. Half of all TBI's in the United States are caused by accidents involving automobiles, motorcycles, bicycles and pedestrians[1]. Alarmingly, fifty percent of TBI incidents involve the use of alcohol[2]. The incidence rate of traumatic brain injury is estimated to be between 150-250 cases per 100,000 people per year in both industrialized and non-industrialized countries[3]. In the U.S., approximately 1.4 million people suffer from TBI annually and approximately 50,000 die from head injury[4].

Traumatic brain injury occurs when sudden trauma causes damage to the brain[5]. It can result from a closed head injury, such as when the head suddenly and violently hits an object, or a penetrating head injury, when an object pierces the skull and enters brain tissue. The damage can be focal (limited to one area of the brain) or diffuse (involve more than one area of the brain). Depending on the extent of damage, the symptoms can be mild, moderate or severe. There are several types of TBI's[6]:

- Concussion: short loss of consciousness due to a head injury
- Depressed skull fracture: pieces of the broken skull press into brain tissue
- Penetrating skull fracture: something such as a bullet pierces the skull
- Contusion: a distinct area of swollen brain tissue mixed with blood released from broken blood vessels; can also occur in response to shaking of the brain within the confines of the skull (e.g., shaken baby syndrome)
- Diffuse axonal injury or shearing: damage to individual neurons and loss of connections among neurons
- Hematoma: heavy bleeding into or around the brain
    - Epidural hematoma: bleeding between the skull and the dura (one of the three membranes that covers the brain)
    - Subdural hematoma: bleeding between the dura and the arachnoid membrane (one of the three membranes that covers the brain)
    - Intracerebral hematoma – bleeding within the brain itself

Since little can be done to reverse the initial brain damage caused by trauma, initial medical care focuses on stabilizing the patient, preventing further injury and ensuring proper oxygen supply to the brain and the rest of the body. Many TBI patients may also have spinal cord injuries so great care must be taken in moving and transporting them.

After the patient has been stabilized, medical personnel assess his or her condition by measuring vital signs and reflexes, and by performing a neurological examination. The patient's level of consciousness and neurological functioning is assessed using the Glasgow Coma Scale (GCS), a standardized 15-point test that uses eye opening, best verbal response and best motor response to determine the severity of the brain injury[7]. In addition, imaging tests such as x-rays, CT scans and MRI's are used to determine the diagnosis and prognosis.

Written by Sharon BeltrandelRio

Approximately fifty percent of TBI patients require surgery to remove or repair hematomas or contusions[8]. Serious head injuries may result in[9]:

- Stupor: patient is unresponsive and can be aroused briefly by a strong stimulus such as sharp pain
- Coma: patient is totally unconscious, unresponsive, unaware and unarousable, and does not have sleep-wake cycles; length is generally a few days to a few weeks
- Vegetative state: patient is unconscious and unaware, but continues to have sleep-wake cycles and periods of alertness
- Persistent vegetative state (PVS): patient is in a vegetative state for more than thirty days; upper portions of the brain are damaged but the lower portions are spared
- Locked-in syndrome: patient is aware and awake but cannot move or communicate due to complete paralysis of the body; lower portions of the brain and the brainstem are damaged but the upper brain is not damaged

Disabilities caused by TBI depend on the severity of the injury as well as the age and general health of the patient. Some common disabilities include problems with cognition, sensory processing, communication, behavior and mental health. Part two of this article will address post-injury complications, long-term disabilities, treatment and prevention.

Discussion questions

1. Please summarize the article. What is the main point of the article?
2. What is a traumatic brain injury?
3. What are the main causes of TBI's?
4. What are the various types of TBI's?
5. What is the Glasgow Coma Score?
6. How is a patient treated immediately after a TBI?
7. What are the potential results of a TBI?

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Written by Sharon BeltrandelRio

Topic 27
Traumatic Brain Injury (Part 2)
外相性脳損傷 2

As discussed in part one, traumatic brain injury (TBI) occurs when sudden trauma causes damage to the brain[1]. Depending on the extent of the damage, the symptoms can be mild, moderate or severe. Post-injury complications may include: seizures, hydrocephalus (an accumulation of serous fluid within the cranium, also know as water on the brain) or post-traumatic ventricular enlargement, CSF (cerebrospinal fluid) leaks, infections, vascular injuries, cranial nerve injuries, pain, bed sores, organ system failure in unconscious patients and polytrauma (trauma to other parts of the body)[2]. Each complication must be addressed and treated accordingly.

Long-term disabilities caused by TBI depend on the severity of the injury as well as the age and general health of the patient. Some common disabilities include problems with cognition, sensory processing, communication, behavior and mental health. For example, it is estimated that forty percent of TBI patients develop postconcussion syndrome (PCS)[3]. Symptoms include headache, dizziness, vertigo, memory problems, restlessness, depression and anxiety, and may persist for a few weeks. Memory loss characterized by the loss of specific memories and the partial inability to form and store new ones is the most common cognitive impairment among severe TBI patients[4].

Once patients have been stabilized, rehabilitation is very important to the recovery process. The overall goal of rehabilitation is to improve the patient's ability to function at home and in society[5]. The U.S. National Institutes of Health (NIH) recommends that TBI patients be provided with individual rehabilitation programs based on their strengths and capacities, and that the programs be modified over time[6]. A wide range of specialists may be required to provide rehabilitation that could include physical therapy, occupational therapy, speech/language therapy, physical medicine, psychology/psychiatry and social support. There are a wide variety of rehabilitation settings, varying from home-based to inpatient rehabilitation centers to independent and supportive living centers, and the most appropriate setting must be selected based on the needs of the TBI patient and his or her family.

Head injuries can be prevented by taking precautions such as[7]:

- Wearing a seatbelt and using child safety seats
- Wearing a helmet when cycling, skating, skiing, horseback riding, playing contact sports such as football, and batting and running the bases in baseball and softball
- Locking firearms and bullets in a safe place
- Avoiding falls by using handrails on stairs, using a step-stool with a grab bar, and using safety gates at the top and bottom of stairs when young children are present
- Putting shock-absorbing material such as mulch or sand on children's playgrounds

These precautions greatly reduce the risk of TBI.

Written by Sharon BeltrandelRio

Discussion questions

1. Please summarize the article. What is the main point of the article?
2. What are some of the potential post-injury complications of TBI?
3. What are some of the potential long-term disabilities caused by TBI?
4. What does rehabilitation involve?
5. In what setting is rehabilitation provided?
6. How can head injuries be prevented?

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Written by Sharon BeltrandelRio

Topic 28
Healthcare Professionals' Alphabet Soup
ヘルスケア・医療業界人の肩書き

When attending a medical conference or visiting a hospital in the United States, both Americans and foreigners sometimes feel as if they are swimming in a bowl of alphabet soup. All of the healthcare professionals are wearing name tags, but the letters after their names are sometimes confusing: M.D., Ph.D., D.O., P.A., N.P., A.R.P.N., B.S.N., A.D.N., R.N., L.P.N, and L.V.N., to name just a few. It's no wonder that non-healthcare professionals feel like they are drowning in alphabet soup! What do all these letters mean?

M.D., or Medical Doctor, is probably the most familiar acronym. In the U.S., medical doctors must first earn a four-year undergraduate degree, either a Bachelor of Science (BS) or a Bachelor of Arts (BA), during which most aspiring physicians focus on science (e.g., they major in biology, chemistry or physiology). Then they attend medical school for another four years. Most physicians then complete their residency or specialty (three to seven years, depending on the specialty, e.g. internal medicine or surgery) and pass the state medical board examinations for the state in which they plan to practice medicine. After completing their residencies, some physicians choose to enter a fellowship to train for a sub-specialty such as endocrinology or cardiovascular surgery. Medical doctors who are also board certified in their chosen specialty often have the initials F.A.C.P. (Fellow, American College of Physicians) after their names too. Ph.D. stands for Doctor of Philosophy, the traditional academic doctorate. Doctors of philosophy are qualified to teach at colleges or universities. They can only practice medicine if they have earned a joint M.D., Ph.D. degree, completed their residency and passed the state medical board examinations.

D.O., or Doctor of Osteopathy, is somewhat similar to a medical doctor. They must also earn a BS or BA, followed by successful completion of four years of osteopathic medical school, a residency and the state osteopathic board examinations. Their medical schools usually include training in physical manipulation techniques, somewhat similar to chiropractic techniques. P.A., or Physician Assistant, is a relatively new position that came into being in the 1960's when there was a physician shortage in the U.S. Physician assistants must earn a BS or BA, followed by two to three years of additional coursework and training. After passing state examinations, they are licensed to practice medicine under the supervision of a physician. They can diagnose and treat patients, as well as prescribe medications.

N.P. stands for Nurse Practitioner and A.R.N.P. means Advanced Registered Nurse Practitioner. To earn these titles, nurses must complete a registered nursing degree as part of their BS, plus a master's degree, and pass the Family Nurse Practitioner National Certification Exam. Nurse practitioners can diagnose and treat patients, as well as prescribe medications. Most work in collaboration with physicians and are accredited by the American Academy of Nurse Practitioners.

B.S.N., or Bachelor of Science in Nursing, is awarded after four years of studying the science and principles of nursing, including coursework in not only bedside care, but also nursing science, research, leadership and nursing informatics. To receive a license and practice as a nurse, one must pass the National Council Licensure Examination for Registered Nurses (NCLEX-RN) or for Practical Nurses (NCLEX-PN).

Written by Sharon BeltrandelRio

A.D.N., which stands for Associate's Degree in Nursing, is awarded after two-years of study. To receive a license and practice as a nurse, one must pass the NCLEX-RN or NCLEX-PN.
R.N., or Registered Nurse, is another familiar title. A registered nurse is someone who has completed either a diploma in nursing, a bachelor's degree in nursing (B.S.N.) or an associate's degree in nursing (A.D.N.), and who has passed the NCLEX-RN or NCLEX-PN.

L.P.N., Licensed Practical Nurse, and L.V.N., Licensed Vocational Nurse, are nurses that have completed only one year of coursework after high school. They are not Registered Nurses.
This is only the tip of the iceberg. There are multiple other acronyms for healthcare professionals. Hopefully this is a helpful guide to the most common abbreviations and will help you navigate through a hospital's alphabet soup.

Discussion questions

1. Please summarize the article. What is the main point of the article?
2. What does M.D. stand for, and what is required to practice medicine in the United States?
3. Which healthcare professionals can prescribe medications?
4. Which acronyms are related to nursing?
5. What is the difference between a nurse practitioner and a registered nurse?
6. Which of these healthcare professionals can one find in a Japanese hospital or clinic?
7. Which of these healthcare professionals do not exist in the Japanese healthcare system? Would the Japanese healthcare system benefit from their services?

Written by Sharon BeltrandelRio

Topic 29
Colorectal Cancer
結腸直腸癌

In 2005, approximately 115,000 new patients were diagnosed with colorectal cancer in Japan, making it one of the most common types of cancer in the country[1]. In the past fifty years the incidence of colorectal cancer in Japan has increased significantly[2]. Colorectal cancer includes both colon cancer (cancer of the large intestine, the lower part of the digestive system) and rectal cancer (the last six inches of the colon).

Colorectal cancer often begins as adenomatous polyps, which are small, benign (noncancerous) clumps of cells. They are usually mushroom-shaped, but may also be flat or recessed into the colon wall (nonpolypoid lesions). Over time, some of the polyps may become cancerous. In the early stages, many patients do not experience any symptoms. As the cancer progresses, some of the symptoms may include rectal bleeding or blood in the stool, persistent cramping, gas and abdominal pain. Symptoms vary depending on the cancer's size and location.

If symptoms are present, a colonoscopy is usually performed. Preparation for a colonoscopy involves taking a laxative and drinking a large amount of fluid to clean out the colon. Then a colonoscope, a long, slender, flexible tube attached to a video camera and monitor, is used to view the colon. If polyps are found during the exam, the doctor usually removes them or takes a tissue sample for laboratory analysis.

If cancer is diagnosed, it is then staged to determine the appropriate course of treatment:

- Stage 0 – Earliest stage. Cancer is present in the colon or rectum mucosa (inner layer) only. Also called carcinoma *in situ*.
- Stage I – Cancer has grown through the mucosa but has not spread beyond the colon wall or rectum.
- Stage II – Cancer has grown through the colon or rectum wall but has not spread to lymph nodes nearby.
- Stage III – Cancer has spread to nearby lymph nodes but isn't affecting other parts of the body.
- Stage IV – Cancer has metastasized to other parts of the body.
- Recurrent – Cancer has returned after treatment. It may recur in the colon, rectum or another part of the body.

The primary treatments for colorectal cancer can be used alone or in combination:

- Surgery – The cancerous portion of the colon or rectum is removed, and the healthy portions are reconnected if possible. Otherwise, a colostomy is required. An opening in the abdomen wall is created from a portion of the remaining bowel for the elimination of body waste into a special bag. Side effects of surgery may include temporary pain, constipation and diarrhea.
- Chemotherapy – Drugs are used to destroy cancer cells. Chemotherapy is often used in combination with surgery, radiation therapy, and/or targeted colorectal cancer drugs. Possible side effects may include nausea, vomiting, mouth sores, fatigue, hair loss and diarrhea.

Written by Sharon BeltrandelRio

- Radiation therapy – X-rays or another powerful energy source are used to kill cancer cells. It is often used in combination with other treatments. Side effects may include diarrhea, rectal bleeding, fatigue, loss of appetite, and nausea.
- Targeted drug therapy – Drugs that specifically target the cancer cells include bevacizumab (Avastin), which prevents tumors from developing new blood vessels, as well as cetuximab (Erbitux) and panitumumab (Vectibix), which target a chemical signal that instructs cells to divide an reproduce. Not all of these drugs have been approved in all countries, so they may still be considered experimental in some parts of the world.

To prevent colorectal cancer, screening should begin at age 50. Screening should begin sooner for people at increased risk. The primary risk factors for colorectal cancer include age (90% of people diagnosed are older than fifty), history of adenomatous polyps, inflammatory intestinal conditions such as ulcerative colitis, inherited disorders that affect the colon, family history of colon cancer and polyps, diet (the risk of colon cancer increases when people move from a developing country to a Western country and adapt to the Western diet), sedentary lifestyle, diabetes, obesity, smoking, alcohol, growth hormone disorder, and radiation therapy for cancer directed at the abdomen[3].

- Steps that can be taken to prevent colorectal cancer include:
- Eat a diet rich in fruits, vegetables and whole grains, as well as a variety of foods to increase the consumption of vitamins and minerals
- Limit fat, especially saturated fat
- Limit alcohol consumption
- Refrain from smoking
- Be physically active
- Maintain a healthy body weight

Discussion questions

1. Please summarize the article. What is the main point of the article?
2. What is colorectal cancer?
3. What is the incidence of colorectal cancer and what has been the trend over the past fifty years?
4. What are the symptoms of colorectal cancer?
5. Why is colorectal cancer staged? What are the stages?
6. How is colorectal cancer treated?
7. What are the risk factors for colorectal cancer?
8. How can colorectal cancer be prevented?

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Written by Sharon BeltrandelRio

Topic 30
Health insurance and emergency care
医療保険及び緊急医療

According to the World Health Organization, health expenditure per capita in Japan was $2,244 in 2006, compared to $5,711 in the United States, and health expenditure as a percentage of GDP was 7.9% in Japan compared to 15.2% in the U.S[1]. Healthcare in the U.S. is legendary for its high cost. These high costs have lead to frequent increases in the price of health insurance, making it unaffordable for many people. The Census Bureau reported that in 2006, 47 million Americans had no health insurance[2]. What happens if someone in the U.S. who does not have health insurance needs emergency medical care? Let's look at a hypothetical example.

John is a 26 year-old man who works for a very small company. His company, like nearly half of all companies with less than ten employees, does not offer health insurance[3]. He does not qualify for Medicare (the government healthcare program for the elderly) because he is young, and he does not qualify for Medicaid (the government program for low-income and disabled people) because he earns $30,000 per year (in 2006, the federal poverty level was $20,000 for a family of four).

One day, John was riding his motorcycle to work. An oncoming car making a left-hand turn did not see him, and crashed into him. John was wearing a helmet, but was thrown from his motorcycle and knocked unconscious. Someone who saw the accident called 911, and an ambulance arrived quickly and took him to the nearest hospital emergency room. Due to the Emergency Medical Treatment and Active Labor Act (EMTALA), a law passed by the U.S. Congress in 1986, any patient that goes to a hospital emergency room requesting examination or treatment must be provided with an appropriate medical screening examination to determine if he is suffering from an emergency medical condition. If the patient is suffering from an emergency medical condition (a condition of sufficient severity that the absence of medical attention would result in placing the health of the injured in serious jeopardy), the hospital is obligated to treat him until he is stable or transfer him to another hospital in conformance with the law's directives. John was obviously in an emergency medical condition, and the law states that neither examination nor treatment may be delayed due to inability to pay. The law does not prohibit the hospital from asking whether the patient has health insurance or the ability to pay, but treatment cannot be delayed if the patient is in an emergency medical condition. This law was passed to prevent hospitals from rejecting patients, refusing to treat them, or transferring them to "charity hospitals" or "county hospitals" based on their ability to pay.

After John's condition stabilized, the hospital was no longer legally required to continue treating him. However, the hospital did not discharge him until appropriate, and a payment plan to cover some of the treatment costs was negotiated based on John's ability to pay. The remaining costs of treatment had to be absorbed by the hospital.

Written by Sharon BeltrandelRio

Discussion questions

1. Please summarize the article. What is the main point of the article?
2. Why has the cost of health insurance increased?
3. Explain the Japanese health insurance system.
4. Why doesn't John qualify for Medicaid or Medicare?
5. What is the EMTALA?
6. Why was the EMTALA passed?
7. Is there a similar law in Japan?
8. What is the meaning of the last sentence, "The remaining costs of treatment had to be absorbed by the hospital"?

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Written by Sharon BeltrandelRio