

Anatomy Class NTI Packet Information

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Remind: To sign up text the code "apmsg" to 81010

Once signed up you may send me messages

NTI Assignment Instructions for Days #1 – 5 *ASSIGNMENTS ARE DUE 3 DAYS AFTER NTI DAY IS USED!!!**

Objective: Students will review the material covered during the 1st semester through reading articles and responding to article review questions.

Article List for each NTI day:

- Day #1 – *What's the Buzz with Energy Drinks?*
- Day #2 – *World Health Organization - Cancer*
- Day #3 – *Some Athletic Men May Risk Low Bone Density*
- Day #4 – *Chocolate 'Causes Weak Bones*
- Day #5 – *Temporomandibular Joint Disorders*

Remember to complete the question set for the article response provided below for each article, each day. This will be completed on your own paper and turned into the teacher on the specified day.

Article Response Questions:

1. Article Title:
2. Who wrote this article and why?
3. What did you learn? (Describe at least 3 things in complete sentences)
4. How did this relate to what we have studied? What was your general reaction to this article?
5. What real-world implications and/or connections did you find in this article?
6. List 3 things this article made you wonder about or you would like to know more about.
7. What alternative title would be appropriate for this article?
8. How would you rate this article, considering readability, knowledge, gained and clarity? (10 being the highest and 1 being the lowest) _____

Standards Addressed by Projects Include:

HS – LS 1 – 1, 2, 3

What's the Buzz with Energy Drinks?

Energy drinks have become extremely popular, especially among college students looking for a pick-me-up to get through the day. Yet these energy drinks are not all they're cracked up to be. Energy drinks should not be used to replace nourishing food, or in combination with alcohol, and they may be harmful to your body.

Energy drinks as fuel

Energy drinks should not be used in place of meals or healthy snacks. Though some drinks do contain certain vitamins and carbohydrates, whole foods can provide more nutrients for your body. Snacks such as fruit, yogurt, or whole grain cereal bars are better choices when you are low on energy. Yogurt smoothies and nutritional shakes are drinkable options.

Energy drinks and hydration

For busy students, it may be tempting to replace healthy beverages like water with energy drinks because of the misconception that they will provide more energy. The caffeine present in energy drinks can contribute to dehydration, and energy drinks may also cause gastric distress during exercise due to a high sugar (or artificial sweetener) concentration. Additionally, some energy drinks are carbonated. Bubbles from carbonated beverages take up space in the stomach and can give a false sense of fullness, so one may end up drinking less fluid than needed. Water and/or sports drinks are better choices for hydration before, during, and after a workout. The National Athletic Trainers Association recommends:

- Drink 17-20 fluid ounces 2-3 hours prior to working out
- Drink 7-10 fluid ounces 15-20 minutes prior to working out
- Drink 7-10 fluid ounces every 10-20 minutes during your workout
- After your workout, drink 16-24 fluid ounces for every pound you lost in sweat. Try to do this within 2 hours.

The dangers of energy drinks

Energy drinks often contain amounts of caffeine higher than the maximum amount that the Food and Drug Administration (FDA) allows in cola beverages (45.3 mg/8.4oz.). High intakes of caffeine (greater than 300 mg per day) may have detrimental health effects in the short term, such as headaches, anxiety, increased heart rate, increased blood pressure and insomnia. In the long term, too much caffeine may contribute to low bone density and may harm unborn children and nursing babies (if consumed by the mother). Besides caffeine, some energy drinks contain large amounts of calories with few nutrients. Excess calories can contribute to unnecessary weight gain. Check out the table below for the caffeine and calorie content of certain energy drinks and other beverages.

Beverage	Serving Size (fl. oz.)	Caffeine (mg)	Calories
Red Bull™	8.3	66.7	115
Red Bull™ Sugar Free	8.3	69.7	10
Sobe® Adrenaline Rush	8.3	76.7	140
Sobe® No Fear	16	141.1	260
Amp™	8.3	69.6	114
Brewed coffee (black)	8	65-120	0
Brewed tea (black)	8	20-110	0
Coca-Cola®	12	29.5	146
Diet Coke®	12	38.2	0
Pepsi®	12	31.7	152
Diet Pepsi®	12	27.4	0
Mountain Dew®	12	45.4	165

NTI Day #1 Article

Energy drinks may contain substances like guarana and taurine. Guarana comes from a South American plant and is a stimulant more potent than caffeine. The FDA has banned the sale of products containing guarana in the United States. Taurine is an amino acid naturally present in protein foods, but it may have harmful health effects when combined with alcohol. Alcohol negatively impacts taurine homeostasis, which can lead to increased impairment.

When drinking a combination of alcohol and an energy drink, the energy drink may blunt a person's perception of headache, weakness, and dry mouth, but not objective motor coordination and visual reaction time. Thus one may feel less intoxicated and end up drinking more without realizing the full effects of the alcohol.

For more information about make an appointment to speak with a Registered Dietitian at the Sportwell Center or McKinley Health Center by calling 244-0261 or 333-2714.

References

- Ferreira SE et al. Effects of energy drink ingestion on alcohol intoxication. *Alcoholism: Clinical and Experimental Research*. 2006; 30:598-605.
- Fink HH, Burgoon LA, Mikesky AE. *Practical Applications in Sports Nutrition*. Sudbury, MA: Jones and Bartlett Publishers, 2006
- Finnegan D. The health effects of stimulant drinks. *British Nutrition Foundation Nutrition Bulletin*, 2003; 28:147-155.
- Jay SM, Petrilli RM, Ferguson SA, Dawson D, Lamond N. The suitability of a caffeinated energy drink for night-shift workers. *Physiology and Behavior*. 2006;925-931.
- Kundrat S. *101 Sports Nutrition Tips*. Coaches Choice, 2005.
- McCusker, RR, Goldberger, BA, Corie, EJ. Caffeine content of energy drinks, carbonated sodas, and other beverages. *Journal of Analytical Toxicology*. 2006; 30:112-114.
- Scholey AB, Kennedy DO. Cognitive and physiological effects of an "energy drink": an evaluation of the whole drink and of glucose, caffeine and herbal flavouring fractions. *Psychopharmacology*. 2004; 176:320-330.
- CalorieKing Web site, search for energy drinks

If you are a registered University of Illinois student and you have questions or concerns, or need to make an appointment, please call: **Dial-A-Nurse at 333-2700**

If you are concerned about any difference in your treatment plan and the information in this handout, you are advised to contact your health care provider.

Visit the McKinley Health Center Web site at: <http://www.mckinley.uiuc.edu>

Cancer

Key Facts

- Cancer is a leading cause of death worldwide: it accounted for 7.4 million deaths (around 13% of all deaths) in 2004.
- Lung, stomach, liver, colon and breast cancer cause the most cancer deaths each year.
- The most frequent types of cancer differ between men and women.
- More than 30% of cancer deaths can be prevented.¹
- Tobacco use is the single most important risk factor for cancer.
- Cancer arises from a change in one single cell. The change may be started by external agents and inherited genetic factors.
- Deaths from cancer worldwide are projected to continue rising, with an estimated 12 million deaths in 2030.

Cancer is a generic term for a large group of diseases that can affect any part of the body. Other terms used are malignant tumours and neoplasms. One defining feature of cancer is the rapid creation of abnormal cells that grow beyond their usual boundaries, and which can then invade adjoining parts of the body and spread to other organs. This process is referred to as metastasis. Metastases are the major cause of death from cancer.

Global burden of cancer

Cancer is a leading cause of death worldwide. The disease accounted for 7.4 million deaths (or around 13% of all deaths worldwide) in 2004. The main types of cancer leading to overall cancer mortality each year are:

- lung (1.3 million deaths/year)
- stomach (803 000 deaths)
- colorectal (639 000 deaths)
- liver (610 000 deaths)
- breast (519 000 deaths)

More than 70% of all cancer deaths occurred in low- and middle-income countries. Deaths from cancer worldwide are projected to continue rising, with an estimated 12 million deaths in 2030.

The most frequent types of cancer worldwide (in order of the number of global deaths) are:

NTI Day #2 Article

- Among men - lung, stomach, liver, colorectal, oesophagus and prostate
- Among women - breast, lung, stomach, colorectal and cervical.

What causes cancer?

Cancer arises from one single cell. The transformation from a normal cell into a tumour cell is a multistage process, typically a progression from a pre-cancerous lesion to malignant tumours. These changes are the result of the interaction between a person's genetic factors and three categories of external agents, including:

- physical carcinogens, such as ultraviolet and ionizing radiation
- chemical carcinogens, such as asbestos, components of tobacco smoke, aflatoxin (a food contaminant) and arsenic (a drinking water contaminant)
- biological carcinogens, such as infections from certain viruses, bacteria or parasites.

Some examples of infections associated with certain cancers:

- Viruses: hepatitis B and liver cancer, Human Papilloma Virus (HPV) and cervical cancer, and human immunodeficiency virus (HIV) and Kaposi sarcoma.
- Bacteria: Helicobacter pylori and stomach cancer.
- Parasites: schistosomiasis and bladder cancer.

Ageing is another fundamental factor for the development of cancer. The incidence of cancer rises dramatically with age, most likely due to a buildup of risks for specific cancers that increase with age. The overall risk accumulation is combined with the tendency for cellular repair mechanisms to be less effective as a person grows older.

Tobacco use, alcohol use, low fruit and vegetable intake, and chronic infections from hepatitis B (HBV), hepatitis C virus (HCV) and some types of Human Papilloma Virus (HPV) are leading risk factors for cancer in low- and middle-income countries. Cervical cancer, which is caused by HPV, is a leading cause of cancer death among women in low-income countries.

In high-income countries, tobacco use, alcohol use, and being overweight or obese are major risk factors for cancer.

How can the burden of cancer be reduced?

Knowledge about the causes of cancer, and interventions to prevent and manage the disease is extensive. Cancer can be reduced and controlled by implementing evidence-based strategies for cancer prevention, early detection of cancer and management of patients with cancer.

More than 30% of cancer could be prevented by modifying or avoiding key risk factors, according to a 2005 study by international cancer collaborators¹. Risk factors include:

1. tobacco use
2. being overweight or obese
3. low fruit and vegetable intake
4. physical inactivity
5. alcohol use
6. sexually transmitted HPV-infection
7. urban air pollution

8. indoor smoke from household use of solid fuels.

Prevention strategies:

- increase avoidance of the risk factors listed above
- vaccinate against human papilloma virus (HPV) and hepatitis B virus (HBV)
- control occupational hazards
- reduce exposure to sunlight

Early detection

About one-third of the cancer burden could be decreased if cases were detected and treated early. Early detection of cancer is based on the observation that treatment is more effective when cancer is detected earlier. The aim is to detect the cancer when it is localized (before metastasis). There are two components of early detection efforts:

- Education to help people recognize early signs of cancer and seek prompt medical attention for symptoms, which might include: lumps, sores, persistent indigestion, persistent coughing, and bleeding from the body's orifices.
- Screening programmes to identify early cancer or pre-cancer before signs are recognizable, including mammography for breast cancer, and cytology (a "pap smear") for cervical cancer.

Treatment and care

- Treatment aims to cure, prolong life and improve quality of life for patients. Some of the most common cancer types, such as breast cancer, cervical cancer and colorectal cancer, have high cure rates when detected early and treated according to best practice. Principal treatment methods are surgery, radiotherapy and chemotherapy. Fundamental for adequate treatment is an accurate diagnosis through imaging technology (ultrasound, endoscopy or radiography) and laboratory (pathology) investigations.
- Relief from pain and other problems can be achieved in over 90% of cancer patients through palliative care. Effective ways exist to provide palliative care for patients and their families in low resource settings.

WHO response

In 2008, WHO launched its Noncommunicable Diseases Action Plan. The Cancer Action Plan is currently under development.

WHO, other United Nations organizations and partners collaborate on international cancer prevention and control to:

- Increase political commitment for cancer prevention and control;
- Generate new knowledge, and disseminate existing knowledge to facilitate the delivery of evidence-based approaches to cancer control;
- Develop standards and tools to guide the planning and implementation of interventions for prevention, early detection, treatment and care;
- Facilitate broad networks of cancer control partners at global, regional and national levels;
- Strengthen health systems at national and local levels; and

Some Athletic Men May Risk Low Bone Density

17 Oct 2007



According to the National Osteoporosis Foundation, osteoporosis affects more than 2 million men in the United States and nearly 12 million more have osteopenia -- clinically significant low bone density that is less severe than osteoporosis. Now, a new study from the University of Missouri-Columbia has found that men engaging predominantly in low-impact forms of exercise have an increased incidence of osteopenia -- a condition resulting in two times the risk of bone fracture.

"Unfortunately, some individuals who believe they are doing everything right in terms of their health might be surprised and upset by our finding," said Pamela Hinton, an associate professor of nutritional sciences in MU's College of Human Environmental Sciences, who co-authored the study. "We believe, however, that these results will ultimately serve as education and motivation for these people."

Hinton said the effects of osteopenia can be mitigated by integration of weight-bearing activities into the lifestyle of active individuals. Studies in pre- and post-menopausal women suggest that bone mineral density will increase 2 percent to 3 percent after six months of resistance training three times per week. Small changes in bone density translate into much larger changes in bone strength -- a 1 percent increase in bone density reduces the risk of fracture by up to 5 percent.

"Regular, non-weight-bearing activities, such as swimming and cycling are effective measures for preventing the leading risk factors for death and disability in our society," Hinton said. "But the results of this study suggest that regular weight-bearing activities, such as running, jogging, or rope jumping, are important for the maintenance of healthy bones."

The researchers measured bone mineral density in 43 competitive male cyclists and runners ages 20 to 59. Findings of the study included:

- * The cyclists had significantly lower bone mineral density of the whole body, especially of the lumbar spine, compared to runners.
- * 63 percent of the cyclists had osteopenia of the spine or hip compared with 19 percent of the runners.
- * Cyclists were seven-times more likely to have osteopenia of the spine than the runners. Background facts:
 - * The risk of fracture is increased approximately two-fold in osteopenic individuals and five-fold in people with osteoporosis.
 - * Low bone density in males often remains undiagnosed and inadequately treated and, after suffering a fracture, men are less likely to receive follow-up care than women.
 - * Risk factors for osteoporosis in men are similar to those identified in women: family history, age, low body weight, smoking, excessive alcohol consumption, inadequate calcium or vitamin D intake, low reproductive hormone levels, physical inactivity, and disease or medication affecting bone metabolism.

Chocolate 'Causes Weak Bones'

26 Jan 2008



"Eating chocolate could lead to weaker bones," reported the Daily Express today. The Daily Telegraph also covered a new study that has shown that women who ate chocolate every day had less dense bones than those who ate it less than once a week. The Daily Mail quotes the lead researcher as saying, "These findings could have important implications for prevention of osteoporotic fracture."

The research behind this claim is a cross-sectional study, which by virtue of its design, cannot prove that chocolate consumption causes low bone density in women. Other diet, lifestyle, or environmental factors could have caused the decreased bone density. This finding was also only in women over 70 and so cannot apply to younger women or men. Studies with more robust designs would be needed to confirm this association. Dr. Jonathan Hodgson and colleagues from the Royal Perth Hospital Unit carried out the research. The study was supported by a research grant from Healthway Health Promotion Foundation of Western Australia and from the National Health and Medical Research Council of Australia. The study was published in the American Journal of Clinical Nutrition.

The study was a cross-sectional study of Australian women aged over 70 who had participated in a five-year randomized controlled trial of calcium supplementation to prevent osteoporotic fractures. For this latest publication, the authors looked at the data available on women's chocolate consumption and bone density measurements at the end of the original study (i.e. at five years).

Although 1,460 women were included in the original study, only 1,001 were included in this cross-sectional study. This was primarily because the researchers excluded women who were not able to walk. The women's chocolate intake and overall diet (including beverages) was assessed through a questionnaire. Bone density and strength measurements were made using three different imaging techniques (ultrasound, computed tomography, X-ray absorptiometry) at three different body sites (the heel, the shin and the hip).

The researchers then used statistical methods to explore whether there was a link between total chocolate intake (including solid chocolate and "chocolate containing beverages") and bone density and strength. In their analysis, they took into account other factors that may affect this relationship, including age, BMI, smoking status, physical activity, and other dietary factors. Increased chocolate consumption was associated with lower mean bone density at all the measured sites. When the researchers took into account other factors, such as age, BMI and lifestyle, that could potentially affect this relationship, they found that some of these relationships (e.g. when bone density and strength were measured in the shin) were no longer significant.

The researchers conclude that this is the first study to investigate the relationship between chocolate intake and bone structural measurements. They say that although further studies are needed to confirm the findings, their study raises concerns that frequent chocolate consumption may increase the risk of osteoporosis and bone fracture. This study has weaknesses that are due to the nature of the study design. The authors themselves say that "additional cross-sectional and longitudinal studies are needed to confirm these observations".

Although the study took into account the effects of some factors that could influence the association, there are likely to be others that were not considered. On this point, the researchers say that it is possible that chocolate is a surrogate for some other factor (diet, lifestyle, or environmental) which was not considered or was measured inadequately and therefore chocolate may not be responsible for the observed relation.

The researchers excluded about 200 women who were not able to walk. This would have introduced a bias if those women had different patterns of chocolate intake and bone density than those who were included. - The consumption of solid chocolate and "chocolate containing beverages" was combined in their measure of chocolate intake. The study then was not only about "eating" chocolate as the papers have imply. The researchers analyzed chocolate consumption at one time point (at five years). Although the researchers assessed the persistence of chocolate intake (by comparing intake at year one and year five), they did not use this figure in their analyses. They also did not assess this for "chocolate containing beverages". The study was in women aged over 70 and the findings will not apply to younger women (premenopausal or not) or to men.

Until prospective studies confirm a harmful link between chocolate consumption and bone health women should not be unduly concerned by the results of this study. Because of its high fat and sugar content, chocolate should be consumed in sensible amounts.

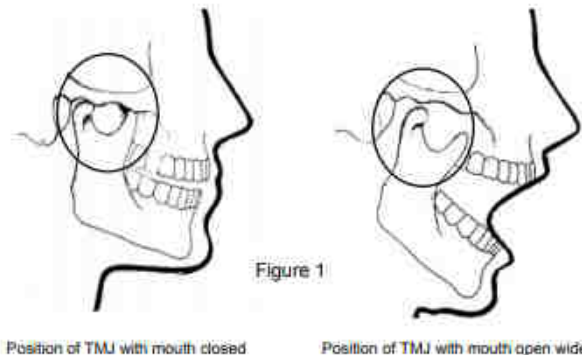
Temporomandibular Joint Disorders

About ten million Americans suffer from such seemingly disparate symptoms as headaches, neck pain, earaches, tenderness of the jaw muscles, or dull, aching facial pain often share a common problem. They all suffer from what has come to be known as temporomandibular joint (TMJ) disorders. These disorders can have a variety of causes and are believed to result when the chewing muscles and jaw joints do not work together correctly. In many cases, TMJ disorders can be successfully treated.

How the chewing muscles and jaw joints work

The structures that make it possible to open and close the mouth are very specialized and work together when you chew, speak and swallow. These structures include the muscles, ligaments, bones and joints of the jaw.

Five pairs of muscles allow you to open and close your mouth. They also control forward, backward, and side-to-side movements of the lower jaw. Also involved in these movements are the temporomandibular joints. Each of these important joints has two sections, connected by a disk, that make possible the hinge and gliding actions needed to open the mouth widely (Fig. 1).



Any problem that prevents this complex system of muscles, ligaments, bones, and joints from working together properly may result in a TMJ disorder.

Signs and symptoms of TMJ disorders

TMJ disorders have many signs and symptoms. Some of the most common include the following:

- Pain in or around the ear. This pain often spreads to the face.
- Tenderness of the jaw muscles.
- Clicking/popping noises when one opens or closes the mouth.
- Difficulty in opening one's mouth.
- Jaws that get stuck, lock, or go out.
- Pain brought on by yawning, chewing, or opening the mouth widely.
- Certain types of headaches or neck aches.

Your dentist can determine the cause of your symptoms by conducting a series of diagnostic tests. These may include a complete medical history, a clinical examination, X-rays, and casts of your teeth. Your dentist may refer you to a physician or to another dentist.

This procedure may seem time-consuming, but proper diagnosis is an important step before treatment. It can save time and money by ensuring that you receive the treatment appropriate for your particular problem.

Causes of TMJ disorders

TMJ disorders often result when the chewing muscles and the temporo-mandibular joint do not work together correctly. When this occurs, the muscles often cramp. This spasm can then become part of a cycle that results in tissue damage, pain and muscle tenderness.

Although trauma such as blows to the jaw or face, and diseases such as osteoarthritis and rheumatoid arthritis may cause TMJ disorders, factors relating to the teeth and bite are common causes of TMJ disorders.

Among these factors are the following:

- Oral habits such as clenching the teeth or grinding the teeth. Clenching is continually biting on things, such as ice, gum, pencils, or fingernails, while awake. It is often due to stress. Grinding (bruxism) usually occurs during sleep. These habits can tire the muscles and cause them to go into spasm. The spasm causes pain, which in turn causes more spasm. The end result of this spasm-pain-spasm cycle may eventually be a TMJ disorder. Many people unconsciously "clench" their teeth during the day, often in response to unperceived environmental stressors.
- Problems in the way the teeth fit together or bite. Improperly aligned teeth can sometimes place the chewing muscles under stress and cause them to go into spasm, thus setting off the harmful cycle described above.
- Oral habits and problems with the bite often work together to cause TMJ disorders.

Treatment for TMJ disorders

Since the teeth, chewing muscles and temporomandibular joints all can be involved in a TMJ disorder, treatments vary. Your dentist will decide what type of treatment is needed for your particular problem. Often, treatment will involve a series of phases. This step-by-step plan is in your best interest because only minor corrective treatment may be needed.

If pain and other symptoms persist, a more involved treatment, such as changing the way your teeth fit together, or even surgery, may be needed. However, surgery is recommended only when a precise cause of the disorder has been pinpointed and usually should not be undertaken until more conservative treatments of the disorder have been tried first.

Some common methods of treating TMJ disorders are listed below:

- Elimination of Spasms and Pain - This can be done by applying moist heat to the face, using prescribed muscle relaxants or other medications, massaging the muscles, and eating soft, non-chewy foods. These are especially helpful for acutely painful flares. Bite plates or occlusal (bite) splints can also be made. This treatment helps to eliminate the harmful effects of clenching or grinding the teeth. Bite guards/splints are more helpful over time to prevent acute flares.
- Counseling or Biofeedback/Relaxation Training - Many times counseling is used along with other forms of treatment. If emotional stress is the factor that causes clenching or grinding of the teeth, that stress should be reduced or eliminated. Biofeedback, a relaxation technique that teaches people to control tension throughout various parts of the body with the aid of an electronic monitoring device, can also be helpful in reducing muscle tension in the jaw. Such mind/body techniques as the Alexander Method can be helpful in muscle re-education.
- Correcting the Way the Teeth Fit Together - If your bite is incorrect or uneven, it can be adjusted by selective grinding of the teeth. Orthodontic appliances (braces) and other dental procedures may also be used to reduce problems caused by improperly aligned teeth.
- Surgery - If muscle spasms have occurred for long periods, the TMJ itself may become injured or arthritic. In addition the bones and soft tissues of the TMJ may slip out of normal position because of trauma such as a blow to the head, or some other cause. Occasionally, in cases such as these, surgery may be needed to correct the TMJ problem.

Your dentist and other health professionals who provide treatment for TMJ disorders care about your health and comfort. Follow the recommendations they give you and discuss with them any concerns you may have. Remember, in many cases the pain, headaches, and other symptoms associated with TMJ disorders can be successfully treated.

References

"TM-Temporomandibular Disorders," printed by American Dental Association, Bureau of Health Education and Audiovisual Services, Chicago, IL, 1985
www.ada.org/public/topics/tmd_tmj.asp
www.emedicinehealth.com

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