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## **Latex: It's Not Just for Condoms! A Learning Experience to Actively Engage and Educate Students about Testicular Cancer**

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### ***Abstract***

Testicular cancer is the most prevalent form of cancer among younger males, and, if detected early, it is highly curable.

*Objectives:* Specific to testicular cancer, after this lesson, students will be able to (1) identify the two main forms, (2) identify genetic and behavioral risk factors, (3) access valid and reliable information, (4) assess personal beliefs/feelings about testicular self-exams (TSEs), and (5) correctly identify pathological and non-pathological testes as demonstrated through palpation of latex models.

*Primary Audience:* High-school through college-aged students. The instructor may decide to present the lesson in single sex classrooms if student or parent discomfort level exists.

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## ***Introduction***

The testes are the male gonads that produce sperm for reproduction as well as androgens, such as testosterone, for masculinizing the body (McKinley & O'Loughlin, 2006). One in every two males is likely to experience some form of cancer in his lifetime (e.g., prostate, skin, liver, pancreatic, testicular) (Jemal et al., 2009). Lifetime prevalence of testicular cancer, which can occur in one or both testes, is 1 in 250 and accounts for approximately 5% of all cancers in males (Chia et al., 2010; Garner et al., 2005). In the United States, 8,000 new cases are identified per year, and 390 men die annually from all existing cases (Chia et al., 2010). Specific to younger males (typically between the ages of 15-35), testicular cancer is the most prevalent form of cancer.

In addition to a few rare types of testicular cancer, two general forms exist – seminomas (a germ cell tumor of the testes) and non-seminomas (germ cell tumors not of the testes, which include choriocarcinoma, embryonal carcinoma, teratoma, and yolk sac tumors). Non-seminomas tend to grow and spread more rapidly making early detection, diagnosis, and treatment particularly important (Jensen et al., 2008). Various risk factors for both seminoma-type and nonseminoma-type cancers include being male, age (15-35), ethnicity (Caucasian), family history (father or brother), personal history (previous cancer), having an undescended testicle (cryptorchidism), or other abnormalities of the genitourinary system such as penile deformities and kidney dysfunction. Additionally, behavioral risk factors include exposure to environmental pollutants, toxins, lack of regular exercise, diets high in fat, and obesity (Bray et al., 2006; Richiardi, Pettersson, & Akre, 2007).

As with most cancers, early identification of testicular cancer is important, and most males will find suspicious changes in their testes themselves or by a health care provider during a routine physical examination (Moul, 2007). Signs (what is seen by the patient and physician) and symptoms (what is reported by the patient) of testicular cancer may include a painless lump or swelling in a testicle, general pain or discomfort in a testicle or the entire scrotum, testicular enlargement, and a dull ache or heavy feeling in the scrotum, abdomen, groin, or lower back. Other varied

signs and symptoms exist, but, in some cases, there are no symptoms, which make it critical for males to perform regular testicular self-exams (TSEs).

Even though TSEs are useful in identifying testicular anomalies, many males are resistant to actually performing them due to a variety of factors. For example, Singleton (2008) noted that males may lack knowledge regarding how to interpret suspicious findings. Moreover, Singleton reported that traditional masculine values, including stoicism and avoidance, contribute to why males may be resistant to performing a TSE. It seems obvious, then, that all people involved in the health care of males, including health educators, should encourage males to perform regular TSEs; if suspicion of an abnormality exists, blood tests, diagnostic ultrasonography, and tissue biopsy can be performed by medical personnel to confirm or refute the presence of testicular cancer. Identifying the stage of the cancer and whether or not it has spread (metastasized) also is important during diagnosis (Wampler & Llanes, 2010).

The positive aspects of early identification of testicular cancer are that 95% of cases can be controlled or cured (“Testicular Cancer,” n.d.). As with all forms of cancer, recurrence is possible and difficult to predict; therefore, a vigilant approach of self-monitoring and regular follow-up with a health care provider is warranted (Vidrine et al., 2010). Because many younger males do not know their personal or family medical history, feel embarrassed talking about personal anatomy, and may not regularly access health care for routine health maintenance (Singleton, 2008), including teaching modules in health classes beyond informational handouts is suitable and helpful, particularly considering that many school districts may not have resources to purchase testicular models.

## ***Objectives***

After this lesson, students will be able to:

- identify the two main forms of testicular cancer;
- identify genetic and behavioral risk factors in the development of testicular cancer;
- access valid and reliable information about testicular cancer;
- assess beliefs/feelings about TSEs;

- correctly identify pathological and non-pathological testes as demonstrated through palpation of latex models provided by the teacher.

### ***Materials and Resources***

- Internet access
- Valid and reliable resources (Table 1)
- Prepared PowerPoint slides or overhead transparencies and a projector
- 3'' x 5'' note cards
- Plain letter envelopes
- Pen and paper
- Multicolored 9'' latex balloons
- Fine grain rice (Basmati<sup>®</sup> works well), sand or talcum powder to represent the consistency of fluid and tissue in a normal testis
- Bagged (hard) black-eyed peas or small pebbles which represent possible cancerous anomalies of the testis (e.g., smaller size tumors)
- Small cotton balls which represent possible consistency of a hydrocele; a hydrocele is a collection of fluid around the testis in the scrotum
- Elastic hair bands cut in half which represent possible varicocele; a varicocele is a dilated (enlargement) vein supplying each testis and often is describe as feeling like a “bag of worms.”
- Marbles to represent a more obvious anomaly of a testis (possibly a larger cancerous tumor).
- Testicular cancer worksheet for comparisons (Table 2)

### ***Primary Audience***

This teaching strategy is designed for male and female students in high school through college.

### ***Procedure***

#### **Preparation for the Class Activity**

Prior to beginning the class activity, the instructor should gather the requisite supplies, which

can be found in most food and convenience stores or craft stores. The empty 9-inch balloons will be filled with rice, sand, or talcum powder (the instructor can make a choice regarding which to use of these three “base” materials) and stuffed with a black-eyed pea, cotton ball(s), cut hair ties, marbles, or nothing (each balloon typically will contain only one item (or nothing); however, the instructor may include multiple items to simulate multiple anomalies). Each balloon should be filled approximately  $\frac{3}{4}$  full leaving enough space to add a component (see materials section) and to “tie-off.” A particular color “code” (e.g., yellow) of the balloons should be used to allow the instructor to quickly identify testicular models with pathology (tumor/cancer [base material, black-eyed peas, marble], hydrocele [base material, cotton balls], or varicocele [base material, cut hair ties bands]); other colors (e.g., blue, white, black) should be mixed so it is not obvious to the students.

In addition to the creation of the balloon models, the instructor will prepare a brief PowerPoint slide presentation (alternatively, an overhead projector with transparencies will work) to reveal normal testicular anatomy, hydrocele, varicocele, and testicular cancer (see Table 1 for places to find this information.). Only pictures showing the pathologies should be provided (i.e., no statistics, facts, or figures). Last, and immediately before the module class, the instructor will place unmarked envelopes randomly under the desks or chairs in the classroom. Each envelope will include either a green or yellow slip of paper (yellow indicating cancer and green as non-cancer). Prepare the number of yellow “cancer” slips based on the number of students in the class and the current reported rates of testicular cancer. For example, most estimates show 5% of males will be diagnosed with testicular cancer; (Vidrine et al., 2010); therefore, in a class of 30 students, two envelopes should have the yellow “cancer” slips of paper/note cards. Moreover, the instructor will place one research note card with a learner-generated fact in each envelope in addition to the colored paper slip (See research fact finding module for details.).

#### **Procedures for Class Activity**

This lesson requires approximately 60 minutes to complete and is divided into multiple sections (modules). After “Preparation for Class Activity” procedures have been concluded, the instructor should follow the following six instructional

modules (Research and Fact Finding, PowerPoint, Fact Sharing, Palpation, Affective, and Question/Answer).

**Research and Fact Finding Module (out-of-class assignment)**

At the class meeting prior to this 60-minute teaching technique, the instructor will assign students to conduct Internet searches about various aspects of testicular cancer, such as statistics, risk factors, recognition, diagnosis, and treatment options (See Table 1 for valid and reliable sources).

**Table 1:** *Valid and Reliable Cancer Resources*

<b>Name of Source</b>	<b>Site/Location</b>
<b>National Cancer Institute (NCI)</b>	<a href="http://www.cancer.gov/cancertopics/types/testicular">http://www.cancer.gov/cancertopics/types/testicular</a>
<b>The Mayo Clinic</b>	<a href="http://www.mayoclinic.com/health/testicular-cancer/DS00046">http://www.mayoclinic.com/health/testicular-cancer/DS00046</a>
<b>Medline Plus</b>	<a href="http://www.nlm.nih.gov/medlineplus/ency/article/001288.htm">http://www.nlm.nih.gov/medlineplus/ency/article/001288.htm</a>
<b>WebMD</b>	<a href="http://www.webmd.com/cancer/tc/testicular-cancer-symptoms">http://www.webmd.com/cancer/tc/testicular-cancer-symptoms</a>
<b>American Cancer Society (ACS)</b>	<a href="http://www.cancer.org/Cancer/TesticularCancer/index">http://www.cancer.org/Cancer/TesticularCancer/index</a>
<b>Testicular Cancer Resource Center</b>	<a href="http://www.acor.org/tcrc/">http://www.acor.org/tcrc/</a>

Students will submit their note cards, with one verified fact written on it, to the instructor. The instructor will review each fact to omit duplicates. During the module, the envelopes containing the facts should be placed under the desks/chairs in the classroom along with the yellow or green pieces of paper (one envelope will contain both the fact and the colored piece of paper). An alternative to this module is for the instructor to compose facts and figures instead of the students seeking out the information.

**PowerPoint Module (10 minutes)**

Beginning this module, PowerPoint slides that reveal various features and pathologies of the testes will be shown. Information for the slides should be selected by the instructor from valid and reliable resources (see Table 1.) (Please note that this information is different from the facts gathered by students in the previous section). The instructor should explain each slide in terms of the anatomy and location of symptoms such as pain/tenderness. Suggested slide titles are: "Testicular Cancer and You," "Structure of a Testis," "Site of Testicular Masses," "Varicocele," "Hydrocele," "Performing a Testicular Self Exam," and "Conclusions: Questions

and Answers." In addition, the instructor may want to visit the American Cancer Society (<http://www.cancer.org>) web site to view the step-by-step procedures utilized when completing a testicular self examination, such as how often to check for anomalies. This step-by-step self exam content

should be added to the PowerPoint. These are only suggested content areas, and, as such, the instructor may decide to either add or omit any of the suggested slides.

**Fact Sharing Module (15 minutes)**

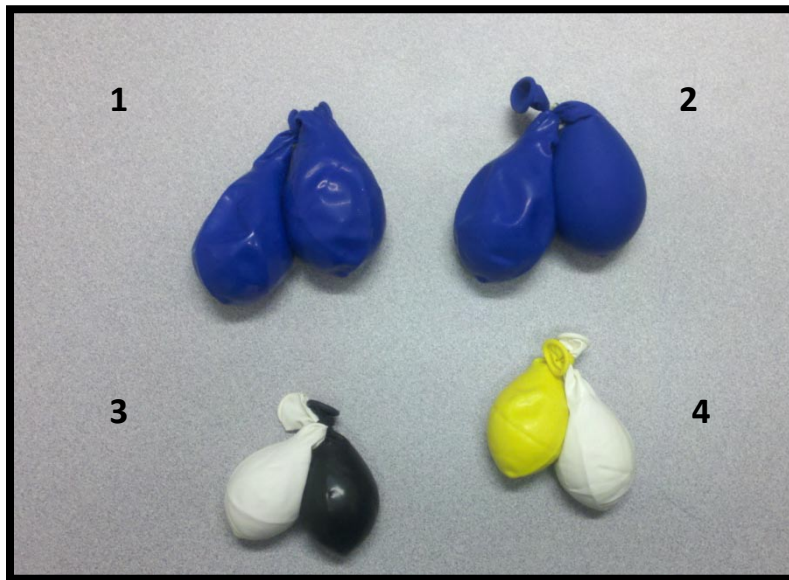
Following the viewing of the slides, the instructor should ask students to locate and open the envelope under their desk or chair. The instructor should ask students with the yellow piece of paper to stand. At this point, it should be explained that testicular cancer affects approximately 5% of males (Chia et al., 2010; Garner et al., 2005). Ask the students who are standing to read their "fact card" and remain standing. Each student should stand and read his/her card until all cards have been read. Instruct students to pair with the person to their left or right side (instructor's choice).

**Palpation Module (15 minutes)**

Next, randomly distribute pairs of the balloon testicles (see Figure 1) to the groups. The instructor should have created 2 cancerous pairs (in total); 2 hydroceles (in total); 2 varicoceles (in total); with the remaining “sets” as normal only containing the base material). Instruct students to work together to identify the abnormal testes versus the normal ones. Instruct

students who believe they have an “abnormal pair” to identify if the pathology is cancerous, a hydrocele or varicocele, (previously described and covered during the PowerPoint module) or for those who have normal pairs, have them use the provided comparison sheets to record the designated diagnosis at the bottom of the sheet (both students will be required to reach consensus) (See Table 2).

**Figure 1.** Balloon Testicular Models



**Key:**

1. **Varicocele (cut elastic hair bands placed in balloon).**
2. **Hydrocele (cotton balls placed in balloon).**
3. **Normal**
4. **Tumor/Cancer (black-eyed pea (s) OR marble(s) placed in balloon).**

**\*In addition, all balloons will be constantly filled with sand, talcum powder or rice.**

*Figure 1.* This figure represents the content from which each pair of testicular models should be made. Please review the key above, which reveals specifics for each pair of testicles.

**Table 2:** *Testicular Cancer Diagnosis and Comparison Worksheet*

*Directions*

Individually, evaluate the balloon model testes and answer the following questions as “yes” or “no” (i.e., “Yes (1)/No (1)”). Repeat the procedure with your partner (i.e., “Yes (2)/No (2)”). Discuss your findings and any areas in which you disagree.

Criteria (signs)	Yes (1)	Yes (2)	No (1)	No (2)
1. Do the testes feel equal in terms of consistency?				
2. Are both testes relatively equal in size?				
3. Can you feel any hard lumps or masses in each testis? (These may or may not be painful)				
4. Does the testis feel like it has a “bag of worms” in it?				
5. Does the testis feel like it is filled with fluid versus a lump?				
Other non-palpable symptoms may include pain in the groin, abdomen, and lower back; heaviness in the scrotum; nausea, and fever.				
Diagnosis? (Write it				

here →

**Key:** Table Interpretation:

A “yes” to questions 1, 2, or 3 indicate more classic signs of testicular cancer in addition to the other non-palpable symptoms;

A “yes” to 4, likely indicates a varicocele;

A “yes” to 5, likely indicates a hydrocele.

In any event, it is important for the facilitator to identify that any and all abnormal findings should be followed with a physician to rule out anomalies.

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Instruct students to switch their diagnosis sheets and pairs of the testicular models with another group to compare (confirm) findings. If groups have differences in their findings, they should discuss how their individual groups came to consensus. Finally, require students to bring the abnormal testicle models to the front of the classroom for confirmation by the instructor. For those who were incorrect, solicit possibilities from the class until the correct option is determined.

#### **Affective Module (10 minutes)**

Last, the instructor should distribute three standard-sized Post It™ notes to each student. On a white board, draw three large circles or squares and title each “cognitive,” “affective,” and “psychomotor.” Require students to write three things learned (cognitive) on one piece of paper, two emotional responses felt at the moment (affective) on the second piece of paper, and one action they *absolutely* will do (psychomotor) as a result of this lesson on the third piece of paper. Students will place these notes on the

board under the appropriate category (Figure 2). Alternatively, the instructor may have students answer the cognitive, affective, and psychomotor responses on the envelopes from the previous section, deliver them in to the instructor and process them as a class during another session.

#### **Question and Answer Module (10 minutes)**

Conclude the lesson by reading the sticky notes created by the students (Figure 2) in each category (cognitive, affective, psychomotor) and ask students for their thoughts or questions.

### ***Assessment Technique***

To assess student learning, a number of assessments may be used, including the Written test (Table 3); Correct identification (Table 2); Listing a fact from Table 1 resources.



Figure 2. Students "3-2-1" Assessment and Discussion



Figure 2. Students will do the following 3-2-1 assessment: 3 things I learned (cognitive); 2 things I feel (affective); and 1 thing I will do (psychomotor). Each of these written comments will be placed on its own sticky note, therefore each student will receive a total of three sticky notes. Once completed, students will submit all three sticky notes to the instructor, which will be placed in the correct category (cognitive, affective, psychomotor). The instructor may opt to have students take their own sticky notes and place them on the chalk/wipeboard under the appropriate heading. From there, the instructor will facilitate any final dialogue that will assist in closing the lesson.

**Table 3:** *Testicular Self Exam Quiz*

*Directions:* To assess your knowledge and understanding of testicular cancer, please choose the best answer for each of the following 10 questions.

1. Testicular cancer is most likely to affect which of the following age groups?
  - a. 5 – 12 year olds
  - b. 15 – 35 year olds
  - c. 40 – 55 year olds
  - d. 65 – 85 year olds
  
2. Testicular cancer is mainly identified by multiple painful, hard lumps in one or both testes.
  - a. True
  - b. False
  
3. If an anomaly is found during a TSE, it is best to wait to see if it will go away.
  - a. True
  - b. False
  
4. Which of the following *increases* your chances of developing testicular cancer?
  - a. Exercising regularly
  - b. Being Caucasian
  - c. Eating a diet low in fat
  - d. Taking one aspirin a day
  
5. According to the American Cancer Society, a testicular self exam (TSE) should be performed after a warm shower or bath every \_\_\_\_\_.
  - a. Year
  - b. 5 years
  - c. Month
  - d. Never, it is not useful
  
6. Testicular cancer has one of the *lowest* cure rates of all forms of cancer.
  - a. True
  - b. False
  
7. A non-seminoma tumor develops at a faster rate than a seminoma.
  - a. True
  - b. False
  
8. Which one of the following often feels like ropes or a “bag of worms” in the scrotum?
  - a. Hydrocele
  - b. Varicocele
  - c. Seminoma
  - d. Fundus
  
9. The testes are the male reproductive organs that produce both sperm and androgens.
  - a. True
  - b. False
  
10. When seeking information concerning cancer, such as testicular cancer, you should seek a valid and reliable source such as the National Cancer Institute.
  - a. True
  - b. False

**Answer Key: 1. (b); 2. (b); 3. (b); 4. (d); 5. (c); 6. (b); 7. (a); 8. (b); 9. (a); 10. (a)**

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