Kayla Jones

03/25/2020

Distance Learning – Web 5

Temporomandibular Disorders and Myofascial Pain Conditions

**Course:** Community Health

**Topic:** Temporomandibular disorders and myofascial pain conditions

**Audience:** Adult learner

**Instructional Objectives:** Upon completion of the lecture, the student should be able to:

1. Name two different types of myofascial pain conditions.
2. Explain how the temporomandibular joint works properly.
3. Compare and contrast temporomandibular joint disk displacement with reducing and temporomandibular joint disk displacement with non-reducing.
4. Discuss the temporomandibular joint exam process.
5. Recommend the best treatment options for temporomandibular joint disorders.

**Materials:** Computer with PowerPoint presentation, TMJ/TMD group activity form

**References:**

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 issues/treatment-of-tmj

**Personnel:** n/a

**Time:** 50 minutes

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| **TIME**2 minutes2 minutes**TIME****TIME**3 minutes3 minutes**TIME**3 minutes2 minutes**TIME**2 minutes3 minutes**TIME**3 minutes2 minutes**TIME**2 minutes2 minutes2 minutes**TIME**3 minutes2 minutes**TIME**2 minutes4 minutes**TIME****TIME**3 minutes**TIME**5 minutes**TIME** | **LESSON CONTENT****I. INSTRUCTIONAL SET**A. IntroductionToday’s lesson examines the need for temporomandibular disorder’s (TMD) to be approached in a detailed manor and understand the necessity for TMD management’s to be performed. The temporomandibular joint (TMJ) is the only joint in the mouth that has to work together bilaterally, so when the joint is not working properly, steps need to be taken to figure out the problem and find a solution. TMD can lead to health conditions such as headaches, cracked teeth, and constant pain if not treated. B. Established MoodBy attending today’s lecture, you will learn the steps to provide proper TMJ examinations. You will also be able to differentiate the most common types of myofascial pain conditions. These steps and information will help you be able to provide the best treatment options for patients experiencing TMD and/or myofascial pain conditions.C. Gaining Attention/MotivateStress is a huge contributing factor with temporomandibular disorders and some myofascial pain conditions. Most of us will reach a stressful period in our life at some point and knowing what signs and symptoms to look out for to make sure we are not doing harm to our body is critical. Pain in the jaw can affect the head with headaches or ear canal with earaches, these are all conditions it is important to be aware of and know when to see a specialist for.D. Established Rational **LESSON CONTENT**By understanding the importance in early diagnosis of TMD and myofascial pain disorders, we can prevent the spread of pain and discomfort throughout the rest of the body and find a solution to stop the discomfort.E. Established Knowledge BaseDo any of you have any popping in your jaw when you open and close it? What about a crunch sound? Has anyone’s jaw ever gotten stuck open before? If so, what did you do to get it to close? Has anyone ever been diagnosed with a myofascial pain disorder? If so, which one?F. Instructional ObjectivesAfter today’s lecture, you should be able to name two different types of myofascial pain conditions, explain how the temporomandibular joint works properly, compare and contrast temporomandibular joint disk displacement with reducing and temporomandibular joint disk displacement with non-reducing, discuss the temporomandibular joint exam process, and recommend the best treatment options for temporomandibular disorders. **LESSON CONTENT**1. Temporomandibular joint
	1. Hinge
	2. Connect jaw and skull
	3. In front of ear
	4. Guides jaw
	5. Open and close mouth
	6. Move mouth side to side
	7. Talk
	8. Yawn
	9. Chew
2. Temporomandibular disorder
	1. Hinge disfunction
	2. 10 million people
	3. Women most common
	4. 20-40 year old’s most common
3. TMD symptoms
	1. Dental team to properly diagnosis
		1. Medical history
		2. Dental history
		3. Clinical exam
		4. Radiographs
	2. Most common
		1. Headache
		2. Earache
		3. Pain behind eye
		4. Pressure behind eye
		5. Clicking when opening
		6. Clicking when closing
		7. Popping when opening
		8. Popping when closing
		9. Pain when opening
		10. Pain when closing
		11. Jaw “gets stuck”
		12. Jaw locks open
		13. Tenderness
		14. Change in occlusion
4. Differential diagnosis
	1. Dental caries
	2. Abscess
	3. Sinus infection
	4. Salivary gland disorder
	5. Oral lesion
		1. Herpes zoster
		2. Herpes simplex
		3. Oral ulceration

 **LESSON CONTENT*** + 1. Lichen planus
	1. Can manifest in autoimmune diseases
		1. Lupus erythematosus
		2. Sjögren syndrome
		3. Rheumatoid arthritis
1. TMJ examination process
	1. Social history
	2. Daily parafunctional activities
		1. Smoking
		2. Chewing gum
		3. Snoring
		4. Leaning on chin
		5. Biting nails
		6. Clenching teeth
		7. Lip biting
	3. Posture
		1. Forward head
		2. Rounded shoulders
		3. Scapular protraction
		4. All three are common
	4. Palate TMJ
		1. Record popping
		2. Record clicking
		3. Record crepitus
		4. Symptoms when opening, closing, or both
		5. Open ended questions
		6. How long symptoms have been occurring
		7. When there is pain
	5. Record deviations
		1. Lateral movements with return to midline
		2. Disc displacement with reduction
		3. Possible neuromuscular dysfunction
	6. Record deflections
		1. Lateral movements without return to midline
		2. Disc dislocation without reduction
		3. Possible muscle restriction
	7. Range of motion (ROM)

 **LESSON CONTENT*** + 1. Measurement
		2. Top tooth edge to bottom tooth edge
		3. 40-50mm normal opening
		4. At least 36 mm for functional
	1. Protrusion of mandible
		1. Normal ~10mm
		2. Lateral deviations ~10mm
		3. Note snapping
		4. Note popping
		5. Note clicking
		6. Note jumps
	2. Alignment of teeth
		1. Note crossbite
		2. Note overbite
		3. Note underbite
		4. Note missing teeth
	3. Opening and closing of mouth
		1. Note symmetry
	4. Tongue tie
		1. Note tongue tie
		2. Note lip frenum’s
1. Common orofacial pain conditions
	1. Myalgia
		1. Subjective pain
		2. Pain in muscle on function
		3. Pain replicated by muscle palpation
		4. No trigger point
		5. Primary differs from secondary
		6. Secondary – from direct trauma
		7. Secondary – arthritic joint disease
		8. Etiology:
			1. Medications (Stimulants or SSRIs)
			2. Stress
			3. Waking parafunctions
			4. Sleeping parafunctions

 **LESSON CONTENT*** + - 1. Muscle injury history
			2. Arthritis
	1. Myofascial pain
		1. Subjective pain
		2. Pain replicated by muscle palpation
		3. Trigger point in band causes pain radiation
		4. Myalgia is myofascial pain if trigger points present
		5. Etiology:
			1. Same as for myalgia
			2. Trigger points
	2. Fibromyalgia
		1. Subjective pain
		2. Multiple sites
		3. Aggravated by function
		4. Widespread pain
		5. Three body quadrants
		6. Continuous symptoms
		7. Myalgia labeled fibromyalgia with these criteria
		8. Etiology:
			1. Same as for myalgia
			2. Multiple pain sites
			3. Allodynia
			4. Mechanical hyperalgesia
			5. Genetic susceptibility
	3. TMJ DDWR (disk displacement with reduction)
		1. Single noise
		2. Click
		3. Pop
		4. Noise may be reciprocal
		5. No restriction of jaw
		6. No deflection of jaw
		7. Etiology:
			1. Traumatically altered disk ligaments
			2. Parafunction
			3. Joint hyper mobility
			4. Microtrauma

 **LESSON CONTENT*** 1. TMJ DDNR (disk displacement non-reduction)
		+ 1. Sudden onset
			2. Lose full jaw motion
			3. Pain opening wide
			4. History of clicking stopped
			5. No popping
			6. No clicking
			7. Etiology:
				1. Traumatically altered disk ligaments
				2. Parafunction
				3. Joint hyper mobility
				4. microtrauma
	2. Local TMJ arthritis
		1. Subjective pain
		2. Preauricular area
		3. Aggravated with function
		4. Pain replicated by TMJ capsule palpation
		5. Crepitation
		6. Joint-surface change/flatting out
		7. Etiology:
			1. Microtrauma
			2. Prior DDNR
	3. Migraine
		1. Unilateral headache
		2. Pulses
		3. Severe headache
		4. Lasts hours
		5. Nausea involved
		6. Photophobia
		7. Phonophobia
		8. Possible aura
		9. Etiology:
			1. Stress
			2. Genetics
			3. Hormones
			4. Weather
			5. Exercise
	4. Cluster headache

 **LESSON CONTENT*** + 1. Rapid onset
		2. Intense paroxysmal
		3. One-sided
		4. Pain 15-180 minutes
		5. Occurs several times in 24-hour period
		6. Wake you up during sleep
		7. Etiology:
			1. Genetics
			2. Abnormal hypothalamus
	1. Tension headache
		1. Dull ache
		2. Bilateral
		3. Long lasting (hours to days)
		4. Pain increases throughout day
		5. Peak pain in afternoon
		6. Etiology:
			1. Stress
			2. hormones
	2. Bruxism
		1. Sleep hyperactivity
		2. Repeat activity of jaw closers
		3. Side-to-side motion
		4. Tooth attrition
		5. Wear patterns
	3. Habitual parafunctional and secondary masticatory hyperactivity
		1. Tooth clenching
		2. Check chewing
		3. Lip biting
		4. Stress masticatory hyperactivity
		5. Medication-induced hyperactivity
1. TMD management
	1. Patient education
		1. Homecare instructions
		2. Individualized treatment
		3. Conservative treatment
		4. Nonsurgical to begin
		5. Soft foods
		6. Cut food

 **LESSON CONTENT*** + 1. Reduce chewing
		2. Ice pack
		3. Jaw exercises
			1. Chin tucks
			2. Stretching
			3. Resistance on chin
			4. Relaxation
			5. Zig-zag jaw
		4. Heat
	1. Pharmacologic therapy
		1. NSAIDS
		2. Muscle relaxants
		3. Antianxiety medications
	2. Physical therapy
		1. Strengthen muscles
		2. Increase ROM
		3. Correct posture
		4. Botox
		5. TMJ injections
		6. TENS unit
		7. Ultrasound therapy
	3. Orthopedic appliance therapy
		1. Occlusal splints
			1. Soft vs. hard appliance
			2. Partial vs. full coverage
			3. Day vs. night splint
	4. Restorative therapy
		1. Orthodontics
		2. Implants
	5. Surgery
		1. Arthroscopy
			1. Most common
			2. Remove inflamed tissue
			3. Realign jaw if necessary
			4. Swelling for a few days
			5. Stiffness for a few days
		2. Arthroplasty
			1. “open joint” surgery

 **LESSON CONTENT*** + - 1. Realign disc displacement
			2. Remove scar tissue
			3. Remove bone spurs
			4. Week off of work
			5. Night or two in hospital
			6. No eating for a week
			7. Stitches for a week
		1. Total joint replacement
			1. Joint degenerated
			2. Traumatic injury
			3. Osteoarthritis
			4. Other irreparable damage
			5. Three to five days in hospital
			6. Month recovery
			7. Out of work six to eight weeks
			8. May require jaw shut

**LESSON CONTENT****CLOSURE**A. Summary of Major Points – Relate Back to ObjectiveI hope that you now have a better understanding of temporomandibular disorders, common myofascial pain conditions, and how to screen for them. Caught early on these conditions may be able to have a simple fix, such as coming off of a stimulant or SSRI medication. Being able to now recognize the difference in the various types of myofascial pain and TMD conditions will assist you in treatment planning the best options for your patient.B. Provide a Sense of AccomplishmentI hope you will be more aware of the need for a TMJ examination on every patient seen for their routine dental hygiene checkup. Providing a night splint to a patient that is experiencing TMD pain due to clenching will save them having to go through TMD surgery and breaking numerous teeth in their mouth due to their habits. I hope the lesson today has helped you feel more confident in being able to perform this TMJ examination on a patient at a routine checkup, or when they come in experiencing jaw pain. You should feel prepared to give sound advice to patients struggling with TMJ discomfort and looking for sources.C. Assignment: For a better understand of our topic today you should: 1. Explore YouTube to view TMJ examinations in action.

 **LESSON CONTENT**1. Keep an eye out for local continuing education courses for TMJ/TMD to get hands on experience with signs, symptoms, and treatment.
2. Explore online dental resources and peer reviewed literature, such as PubMed to find journals with research about the best methods for TMD and myofascial pain treatment.

**CRITICAL THINKING ACTIVITY****Case:** Ms. W is a 22-year-old female that presents to you experiencing: jaw pain, ringing in the ears, clicking in the TMJ when opening, and headaches. When filling out the medical history form you figure out the patient is a current smoker, takes Zoloft for anxiety, and says she thinks she clenches her teeth at night because her headaches are in the morning. 1. What questions will you ask Ms. W?

Answer: How long have you smoked? How much do you smoke? How long have you been on Zoloft? Have you been treated for TMD previously? If so, what have you had done? When does your jaw click? Does it click every time? When do you experience jaw pain? How frequently do you experience jaw pain? Has your jaw ever locked? – opening? Or closing? Do you grind your teeth? How often do your ears ring? What increases the ear ringing? What decreases the ear ringing? Where are your headaches? How often do you have headaches? Are your headaches in the morning, midday, or evening? Do you have neck and/or shoulder pain? Do you chew gum? Do you snore? Do you bite your nails? Do you bite on pens, pencils, etc.?1. What steps will you perform for the TMJ examination? **LESSON CONTENT**Answer: Check posture. Palate for joint noises (clicking, popping, and crepitus) – note if it is on opening, closing, or both – ask the patient if they were aware of it, if it hurts them, and how long it has been going on for. Record any deviation with opening or closing. Record any deflection with opening or closing. Record range of motion. Record protrusion and lateral protrusion. Note if there is a crossbite, overbite, underbite, missing teeth, or any chipped teeth. Note if the teeth close symmetrically and if the jaw is centered. Note if there is a tongue tie or any lip frenum’s.
2. What treatment options are available to her that you should make her aware of?Answer: First educate the patient with homecare instructions – eat soft foods and cut foods into small pieces to reduce excessive chewing when TMD conditions flair up. Rotate ice pack, jaw exercises, and heat on the jaw muscle. Jaw exercises can include a chin tuck, stretching your jaw, resistance on the jaw, relaxation, and zig-jag jaw stretching. Since TMD treatment is not a “one-size-fits-all”, it may include some trial and error. Since the patient is taking an SSRI medication (Zoloft) it may benefit her to talk to her doctor and change to a non-SSRI and non-stimulant medication for her anxiety to see if that helps with her TMD. I would also recommend nonsteroidal anti-inflammatory drugs such as aspirin or ibuprofen to help relieve muscle pain and swelling in the meantime. If changing her anxiety medication does not help, I would recommend a nighttime full coverage hard appliance splint – this will reduce her clenching at night and decrease her headaches. If this does not help she may benefit from physical therapy for her TMJ with Botox, injections, or a TENS unit on her jaw joint.
 | **NOTES-MEDIA-Q/A****Slide #1:**Picture of introduction slide with title of presentation “Temporomandibular joint disorder (TMD) and myofascial pain conditions”**Note:** Introduce myself, my educational background, and my career background in this field to the class. **Q:** Has anyone ever received a TMJ examination before?**A:** Answers will vary.**Q:** Can anyone think of any other contributing factors associated with TMD and myofascial pain conditions?**A:** Answers will vary – hormones, genetics, medications, etc.**NOTES-MEDIA-Q/A****Slide #2:**List of objectives**Note:** Review with students this is just a general list and they will gain more knowledge with the lesson plan today.**Q:** Does anyone know some of the steps to perform a TMJ examination?**A:** Answers will vary.**Q:** Has anyone performed a TMJ examination on someone before?**A:** Answers will vary.**NOTES-MEDIA-Q/A****Slide #3:**Temporomandibular joint (TMJ) information**Note:** Add image of anatomy of TMJ (socket, condyle, disk, etc.) and review it with students.**Q:** Can you think of something else not listed your jaw helps you do?**A:** Answers will vary.**Slide #4:** TMD information**Q:** If a 60-year-old man comes in complaining of signs that may lead to TMD, should it be dismissed due to his demographics? **A:** No, women and the age range of 20-40 is just the most common.**Slide #5:** TMD symptoms **Slide #6:**Differential diagnosis**Note:** These are possible other conditions a patient may be experiencing, besides TMD.**NOTES-MEDIA-Q/A****Slide #7:**TMJ examination process picture**Slide #8:**Social history**Q:** Can anyone think of any other daily parafunctional activities than can cause TMD?**A:** Answers will vary.**Slide #9:**Posture**Slide #10:**Palpate for joint noises**Note:** Explain to students the different sounds of popping, clicking, and crepitus.**Q:** Why are open ended questions important?**A:** Allow responded to include more information and detail on the subject.**Slide #11:**Record deviations**Slide #12:**Record deflections**Slide #13:**Range of motion (ROM) **NOTES-MEDIA-Q/A****Slide #14:**Protrusion of the mandible**Q:** What dental instrument can be used to measure protrusion?**A:** Dental probe (mm’s). **Slide #15:**Alignment of the teeth**Slide #16:**Opening and closing of the mouth**Slide #17:**Tongue tie or lip frenum**Q:** What can you have a patient do to see if they are tongue tied?**A:** Place their tongue to the roof of their mouth. **Slide #18:**Common orofacial pain conditions**Slide #19:**Myalgia information**Slide #20:**Myalgia etiology**NOTES-MEDIA-Q/A****Slide #21:**Myofascial pain information**Q:** What are stimulant and SSRI medications commonly prescribed for?**A:** Anxiety and/or depression.**Slide #22:**Myofascial pain etiology**Slide #23:**Fibromyalgia information**Q:** What is the main difference between myalgia and fibromyalgia? **A:** Fibromyalgia is widespread and covers more body surfaces.**Slide #24:**Fibromyalgia etiology**Slide #25:**TMJ DDWR (disk displacement with reduction) information**Note:** Joint located too far posterior, but rides onto the disk – causing the pop and/or click noise.**Slide #25:**TMJ DDWR - etiology**Slide #27:**TMJ DDNR (disk  **NOTES-MEDIA-Q/A**displacement non-reduction)**Note:** Joint located too far posterior, never catches the disk.**Slide #28:**TMJ DDNR - etiology**Q:** Can anyone name a difference between TMJ DDWR and TMJ DDNR? **A:** Answers will vary.**Slide #29:**Local TMJ arthritis information**Q:** What would be the cause of the joint surface changing/flattening out? **A:** Constant wear of the disk.**Slide #30:**Local TMJ arthritis – etiology**Slide #31:**Migraine information**Slide #32:**Migraine - etiology**Slide #33:**Cluster headache vs. tension headache information **NOTES-MEDIA-Q/A****Slide #34:**Cluster headache vs. tension headache – etiology**Q:** Can anyone name a difference a cluster headache and a tension headache? **A:** Answers will vary.**Slide #35:**Bruxism information**Slide #36:**Habitual parafunctional and secondary masticatory hyperactivity information**Q:** Which two types of medications are most likely to cause medication-induced hyperactivity we discussed before? **A:** Stimulants and SSRIs**Slide #37:**TMD management listed**Slide #38:**Patient education information **NOTES-MEDIA-Q/A****Slide #39:**Pharmacologic therapy information**Slide #40:**Physical therapy information**Q:** Can someone need more than one TMD management to relieve their symptoms? **A:** Yes.**Slide #41:**Orthopedic appliance therapy information**Note:** Give information about pros and cons of each type of occlusal splint.**Slide #42:**Restorative therapy information**Q:** How could orthodontics help with TMD? **A:** Restructure jaw/teeth.**Slide #43:**Surgery information  **NOTES-MEDIA-Q/A** **NOTES-MEDIA-Q/A****Slide #44:**Objectives listed **Q:** What is a medication option that can be prescribed by a licensed physician for TMD pain? **A:** Muscle relaxer or antianxiety**Slide #44:**Smiling dentist and patient picture **Q:** Can anyone tell me a step on the TMJ examination process we reviewed today? **A:** Answers will vary. **NOTES-MEDIA-Q/A****Slide #45:**Critical thinking activity  **NOTES-MEDIA-Q/A** |

**Test Questions**

1. **Objective #1:** Name two different types of myofascial pain conditions.

**Test Item:** All of the following are types of myofascial pain conditions EXCEPT one. Which one is the EXCEPTION?

1. Fibromyalgia
2. Temporomandibular joint disk displacement non-reducing
3. Myalgia
4. Planter fasciitis
5. **Objective #2:** Explain how the temporomandibular joint works properly.

**Test Item:** All of the following statements about the temporomandibular joint are true EXCEPT one. Which one is the EXCEPTION?

1. Located behind your ear.
2. Hinge joint connecting your jaw to your skull.
3. Only joint in the mouth that has to work together bilaterally.
4. Allows you to open, close, talk, yawn, or chew.
5. **Objective #3:** Compare and contrast temporomandibular joint disk displacement with reducing and temporomandibular joint disk displacement with non-reducing.

**Test Item:** Which of the following statements is NOT correct about temporomandibular joint disk displacement with reducing?

1. Click noise.
2. Pop noise.
3. Sudden onset, pain in the affected joint on wide open attempt.
4. No restriction or deflection of jaw motion.
5. **Objective #4:** Discuss the temporomandibular joint exam process.

**Test Item:** Which of the following is NOT part of the temporomandibular joint exam process?

1. Periodontal charting
2. Record any deviations
3. Range of motion
4. Palpate for joint noises
5. **Objective #5:** Recommend the best treatment option for temporomandibular joint disorders.

**Test Item:** All of the following treatment options would be good recommendations for temporomandibular joint disorders EXCEPT one. Which one is the EXCEPTION?

1. Physical therapy
2. Stimulant or SSRI pharmacologic therapy
3. Jaw exercises
4. Orthopedic appliance therapy

**Answer Key:**

1. D
2. A
3. C
4. A
5. B

Lesson Plan Evaluation Rubric:

DNTH 414/514/660

Name \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

***Note: Each section and subsection listed below must be clearly labeled.***

I. Cover Sheet

 1. Course/Topic/Audience/Time/Personnel 1 point \_\_\_\_\_

 2. Instructional Objectives (5 x 3 pts ea) 15 points \_\_\_\_

-all elements included

-followed format

-4 cognitive & 1 affective

1. Materials/Equipment & 5+ References 1 point \_\_\_\_\_

II. Instructional Set

 1. Introduce Topic 1 point \_\_\_\_\_

 2. Establish Mood 1 point \_\_\_\_\_

 3. Gain Attention/Motivate 1 point \_\_\_\_\_

 4. Establish Rationale 1 point \_\_\_\_\_

 5. Establish Knowledge Base 1 point \_\_\_\_\_

 6. Instructional Objectives Clearly Restated 1 point \_\_\_\_\_

 7. Notes and Media Section 6 points \_\_\_\_\_

 -notes section effective (2pts)

 -media effective (2 pts)

 -questioning effective (2 pts)

 8. Time Element Included/Appropriate 1 points \_\_\_\_\_

III. Body/Content

 1. Follow Outline Format (Key words/Phrases) 8 points \_\_\_\_\_

 2. Organized/Logical/ Easy to Read 6 points \_\_\_\_\_

 3. Comprehensive/Sufficient Detail 8 points \_\_\_\_\_

 4. Notes and Media Section 12 points \_\_\_\_\_

-notes effective (3 pts)

 -media effective (3 pts)

 -questions & answers effective

 -min 2 Q&A per page (6pts)

 5. Time Element Included/Appropriate 2 points \_\_\_\_\_

 6. Developed for appropriate audience 4 points \_\_\_\_\_ (applies to entire paper)

IV. Closure/Summary

 1. Summarized Major Points and

 -Related Back to Objectives 2 points \_\_\_\_\_

 2. Provides a Sense of Accomplishment 1 point \_\_\_\_\_

 3. Assignment Included 1 point \_\_\_\_\_

 4. Notes and Media Section 4 points \_\_\_\_\_

-notes section effective (1pts)

 -media effective (1 pts)

 -questions & answers effective (2 pts)

5. Time Element Included/ Appropriate 1 point \_\_\_\_\_

1. Critical Thinking Activity 6 points \_\_\_\_\_

This activity must be included with some time. This can be discussion questions or case(s) that “ties” the entire lecture together at a **high level** of comprehension. Questions and possible responses/answers must be included.

1. Test Items (5 items x 3 pts ea) 15 points\_\_\_\_\_

-all elements included

-format followed (each objective listed with appropriate test item)

 -multiple choice questions only

 -correct answer key included

 Total \_\_\_\_\_ / 100