Intake and Output

Course
Health Science

Unit XI
Occupationally Specific Knowledge and Skills

Essential Question
How do health care skills promote health and prevent illness?

TEKS
130.204 (c) 1C, 8D, 8I

Prior Student Learning
The lesson on systems of measurement

Estimated time
3 Hours

Rationale
Maintaining fluid balance is important in health and wellness.

Objectives
Upon completion of this lesson, the student will be able to:

- Understand conditions when intake and output record would be needed
- List liquids that would be recorded as fluid intake
- List liquids that would be recorded as fluid output
- Accurately measure and record intake and output

Engage
Have students do an online search on Jennifer Strange or show video on Jennifer Strange, a 28 year old who died of water intoxication after participating in a contest at a radio station to win a computer game. Have students discuss:

- How much water do we need a day?
- How much water is too much?
- Which organs help to regulate water balance in the body?

Key Points
I. Fluid Balance: Fluid intake should equal fluid output
   A. Intake
      1. 70% of adult body consists of water
      2. 1% short = thirsty
         5% short = slight shortage
         12% short = possible death
      3. Daily: ½ of body weight in ounces
   B. Output
      1. Average urine output = 1500 cc's
      2. Water is also lost from:
         a. Skin
            i. insensible: 200-400 cc's
            ii. sensible: 300-500 cc's
         b. Lungs: 400cc
         c. Gastrointestinal tract: 100 cc's

II. Fluid Imbalance
   A. Dehydration – fluid output exceeds fluid intake.
      1. Causes
         a. Diarrhea
b. Vomiting  
c. Bleeding  
d. Excessive perspiration (diaphoresis)  
e. Poor fluid intake  

2. Symptoms  
   a. Fever is present.  
   b. There is a decrease in urine.  
   c. Urine is concentrated.  
   d. Weight loss occurs.  
   e. Membranes are dry and it is difficult to swallow.  
   f. Tongue is coated and thickened.  
   g. Skin becomes hard and cracks and is dry and warm.  

B. Edema – fluid intake exceeds fluid output.  
   1. Causes:  
      a. High salt intake  
      b. Infections  
      c. Injuries or burns  
      d. Certain kidney diseases  
      e. Certain heart diseases or heart inefficiencies  
      f. Sitting too long in one position  
      g. Infiltration of IV fluid  
   2. Symptoms:  
      a. Decrease in urine output  
      b. Gain in weight  
      c. Puffiness or swelling  
      d. Sometimes shortness of breath  

III. Intake and Output – chart any fluid taken in and any fluid that is eliminated. Record in cubic centimeters (cc).  

To convert ounces to cubic centimeters:  
   30 X (number of ounces) = number of cc  

A. Intake:  
   1. All liquid taken by mouth  
   2. Any food item that turns to liquid at room temperature (e.g., gelatin, including cream, ice, etc.)  
   3. All fluid taken by IV or tube feeding  

B. Output:  
   1. Urine  
   2. Emesis (vomit)  
   3. Suctioned secretion  
   4. Drainage  
   5. Excessive perspiration  

IV. Converting common measurements  
   A. 2 tablespoons (1 oz) = 30 ml
B. 1 cup (8 oz) = 240 ml  
C. 1 pint (16 oz) = 480 ml  
D. 1 quart (32 oz) = 960 ml

**Activity**

I. Complete the Recording Intake and Output Practice.  
II. Complete the Intake and Output Skill Lab.

**Teacher Note**

Set up a skill lab with client intake and output items. Use food coloring to make it more realistic. Give each student an Intake and Output Record and have them rotate to each client area to measure and record intake and output. See directions for setting up the lab.

**Assessment**

Successful completion of Intake and Output Practice  
Successful completion of Intake and Output Skill Lab

**Materials**

IV bag  
Bedpan  
Urinal  
Orange juice glass  
Milk carton  
Soup bowl  
Emesis basin  
Foley catheter bag  
Wall suction  
Hat for commode  
Food coloring


**Accommodations for Learning Differences**

For reinforcement, the student will develop flashcards for terms.

For enrichment, the student will research a disease or disorder that affects fluid balance and predict how intake and output may be affected.

**National and State Education Standards**

National Health Science Cluster Standards  
HLC 10.01 Health care workers will apply technical skills required for all
career specialties. They will demonstrate skills and knowledge as appropriate.

**TEKS**
130.204 (c)(1)(C) express ideas in writing and develop skills in documentation; and
130.204 (c)(8)(D) employ medical vocabulary specific to the health-care setting;
130.204 (c)(8)(I) perform skills specific to a health science professional such as medical assistant, dental assistant, emergency medical technician-basic, phlebotomy technician, and pharmacy technician.

**Texas College and Career Readiness Standards**
Mathematics
IV.B.1. Convert from 1 measurement system to another; and
IV.B.2. Convert within a single measuring system

Science
I. A. 1. Utilize skepticism, logic and professional ethics in science.

Cross-Disciplinary
I. C. 1. Analyze a situation to identify a problem to be solved.
I. C. 3. Collect evidence and data systematically and directly relate to solving a problem
Mrs. Jane Black is a client who had a gastrectomy (removal of the stomach). A nasogastric tube is in place to drain all fluids. It is connected to suction and irrigated at times. Intake is limited to sips of Sprite and ice cubes.

**Instructions:** Chart the following information on an **I and O record.** Record all 8 hour and 24 hour totals.

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<tr>
<th></th>
<th>Water intake</th>
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<th>Ice cubes (Note: 1 cube = 5 cc)</th>
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<td>100 cc clear liquid</td>
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<td>2100</td>
<td>130 cc reddish brown liquid</td>
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<td>0200</td>
<td>200 cc golden green liquid</td>
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6. **Urine**
   - 1100: 450 cc
   - 1600: 300 cc
   - 2000: 250 cc
   - 2300: 300 cc
   - 0300: 200 cc
   - 0600: 300 cc

7. **Brown liquid stool**
   - 1000: 750 cc
   - 1400: 200 cc
   - 1800: 200 cc

8. **NG suction**
   - 1400: 700 cc brown liquid
   - 2200: 650 cc brown liquid
   - 0600: 425 cc brown liquid

9. **NG irrigation**
   - 0800: 30 cc
   - 1000: 30 cc
   - 1400: 30 cc
   - 1800: 45 cc
   - 0100: 60 cc
   - 0400: 25 cc
# Intake and Output Record

**Measurements:**
- Large glass: 240cc
- Coffee pot: 240cc
- Water glass: 180cc
- Cup: 120cc
- Juice glass: 100cc
- Soup bowl: 200cc
- Small bowl: 120cc
- Jell-O: 120cc

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**Intake:**
- **8 Hr**
- **TOTAL**

**Output:**
- **8 Hr**
- **TOTAL**

**24 Hr**
- **Intake**
- **Output**
Directions for Setting up the Intake and Output Skill Lab

You do not need to have all of the equipment listed; you can usually get IV bags from your hospital or nursing home. It is preferable to place water in the IV bags since most solutions contain dextrose and are very sticky after they dry if spilled. Therefore, empty the solution from the bags and fill each with water. Each student should have an I&O sheet to record the information.

1. At one station hang the IV bag with some solution missing. Have students figure out the amount left in the bag and subtract it from the total amount of solution to figure the IV intake.

2. At another station put brown liquid in a bed pan or it can also be “urine” and “urine” in a urinal. Urinals have measurement lines and can be measured directly in the container. Have students pour the "stool or urine" from the bedpan into a measuring container to see how many cc’s are in each and record this in the correct column on the I&O sheet.

3. A Foley catheter bag can be hung from a bedside or if you do not have a bed, hang it on a desk or chair. Have students use another measuring container (a urinal can be used for this) and empty the catheter into the container. This amount also is charted. If using a yellow liquid, have the students note the characteristics of the “urine;” color, clarity, odor.

4. On a tray, if one is available, (I use ones from the school cafeteria) put a milk carton, soup bowl and orange juice glass. Either have the amount the patient consumed written out on a piece of paper on the tray or put liquids in each container and the students can measure it in a measuring container and subtract it from the total number of cc’s that the container has. Milk cartons, soda cans, water bottles and almost any purchased container has the number of cc’s on the container otherwise use the measurements listed on the I&O sheet.

5. The emesis basin can be measured the same way as the urinal and bed pan. Students pour the “emesis” into the measuring container. Some emesis basins have measurements on the inside of the basin. The student can use these lines.

6. Not many people have wall suction, but if you do, put a liquid looking like either stomach contents or sputum into the container. The students can use the measurement lines on the suction container to calculate output.