Unit 6 Aerosol Delivery Devices

GOAL

On completion of this unit, the student should have an understanding of the proper use of different aerosol delivery devices.

COMPETENCIES

- 1. Demonstrate proper techniques for applying the following aerosol administration devices.
 - a. aerosol mask
 - b. face tent
 - c. Brigg's adaptor
 - d. tracheostomy collar
- 2. Complete applicable procedures in the clinical simulation lab.

EQUIPMENT

- 1. aerosol administration devices
 - a. aerosol mask
 - b. face tent
 - c. Brigg's adaptor
 - d. tracheostomy collar
- 2. pneumatic nebulizer
- 3. small volume nebulizer
- 4. Babington nebulizers
- 5. ultrasonic nebulizer
- 6. Hope or Heart nebulizer
- 7. Pari nebulizer
- 8. AeroEclipse Breath-Actuated nebulizer (BAN)
- 9. distilled water
- 10. unit dose NaCl as required
- 11. patient mouthpiece
- 12. oxygen source
- 13. oxygen flowmeter
- 14. flowmeter nipple
- 15. 3/8 inch oxygen connecting tubing
- 16. large bore corrugated aerosol tubing
- 17. manikin with ETT and simulated tracheostomy

EXERCISE A - USE OF AEROSOL DELIVERY DEVICES

- 1. With your lab partner (or using a manikin), demonstrate proper techniques for applying the following humidity/aerosol delivery devices.
 - a. aerosol mask
 - b. face tent
 - c. Brigg's adaptor
 - d. tracheostomy collar
- 2. Complete the Aerosol procedure in the clinical simulation lab.
- 3. Complete the Small Volume Nebulizer Treatment procedure in the clinical simulation lab.

EXERCISE B – TYPES OF MEDICATION NEBULIZERS

- 1. Pari Nebulizer
 - *Comments*: The Pari nebulizer is commonly used to administer Tobramycin and Pulmozyme. It delivers small, consistent particles with a MMD of 3.8µ. It should be disassembled, rinsed and air-dried between treatments.
 - a. With your lab partner, practice the assembly and disassembly of the Pari nebulizer.
- 2. AeroEclipse Breath-Actuated nebulizer (BAN)
 - **Comments**: The BAN is commonly used to administer respiratory therapy aerosolized medications. It is breath-actuated nebulizer with a spring-loaded, one-way valve design that draws a jet to the capillary tube during inspiration. Nebulization stops when the patient's inspiratory flow decreases below the threshold. The AeroEclipse nebulizer also can be operated manually to synchronize aerosol on inspiration for use with infants and children too small to trigger the device. This neb delivers an aerosol with an MMD of 2.8μ in shorter treatment times.
 - a. With your lab partner, practice the assembly, disassembly and use of the AeroEclipse nebulizer, including use with the specially-designed aerosol mask. *Remember, the flowmeter should be set at 8 L/min. before the nebulizer tubing is attached.*
- 3. Heart and Hope nebulizers (used to administer aerosolized medications for extended lengths of time by aerosol mask)
 - a. Heart neb
 - **Comments**: The Heart nebulizer is a high-output aerosol nebulizer that has an output rate of 30 to 50 mL per hour and a flow rate of 10 to 15 L per minute. It provides up to 8 hours of continuous nebulization and has a 240mL reservoir.
 - 1) With your lab partner, practice the assembly and disassembly of the Heart nebulizer.
 - 2) The following chart is the Dosing Chart for the Heart nebulizer. Dosage Charts are typically derived for albuterol (5 mg/mL) and Normal Saline.

		HEARIG	commu	ous posi	ng Proto	cor @ TU	L. P IVI		
mg/hr	Solution	1 hour	2 hours	3 hours	4 hours	5 hours	6 hours	7 hours	8 hours
2.5 mg	Medication	0.5 ml	1.0 ml	1.5 ml	2.0 ml	2.5 ml	3.0 ml	3.5 ml	4.0 ml
hour	Fill to	30 ml	60 ml	90 ml	120 ml	150 ml	180 ml	210 ml	240 ml
3.0 mg	Medication	0.6 ml	1.2 ml	1.8 ml	2.4 ml	3.0 ml	3.6 ml	4.2 ml	4.8 ml
hour	Fill to	30 ml	60 ml	90 mi	120 ml	150 ml	180 ml	210 ml	240 ml
3.5 mg	Medication	0.7 ml	1.4 ml	2.1 ml	2.8 ml	3.5 ml	4.2 ml	4.9 ml	5.6 ml
hour	Fill to	30 ml	60 ml	90 ml	120 ml	150 ml	180 ml	210 ml	240 ml
4.0 mg	Medication	0.8 ml	1.6 ml	2.4 ml	3.2 ml	4.0 mi	4.8 ml	5.6 ml	6.4 ml
hour	Fill to	30 ml	60 ml	90 ml	120 ml	150 ml	180 ml	210 ml	240 ml
4.5 mg	Medication	0.9 ml	1.8 ml	2.7 ml	3.6 mi	4.5 ml	5.4 ml	6.3 ml	7.2 ml
hour	Fill to>	30 ml	60 ml	90 ml	120 ml	150 ml	180 ml	210 ml	240 mi
5.0 mg	Medication	1.0 ml	2.0 ml	3.0 ml	4.0 m	5.0 ml	6.0 ml	7.0 ml	8.0 ml
hour	Fill to>	30 ml	60 ml	90 ml	120 ml	150 ml	180 ml	210 ml	240 ml
7.5 mg	Medication	1.5 ml	3.0 ml	4.5 ml	6.0 ml	7.5 ml	9.0 ml	10.5 ml	12 ml
hour	Fill to>	30 ml	60 ml	90 ml	120 ml	150 ml	180 ml	210 ml	240 ml
10.0 mg	Medication	2.0 ml	4.0 ml	6.0 ml	8.0 ml	10.0 ml	12.0 ml	14.0 ml	16.0 ml
hour	Fill to	30 ml	60 ml	90 ml	120 ml	150 ml	180 ml	210 ml	240 ml
12.5 mg	Medication	2.5 ml	5.0 ml	7.5 ml	10.0 ml	12.5 ml	15.0 ml	17.5 ml	20.0 ml
hour	Fill to	30 ml	60 ml	90 ml	120 ml	150 ml	180 mi	210 ml	240 ml
15.0 mg	Medication	3.0 ml	6.0 ml	9.0 ml	12.0 ml	15.0 ml	18.0 ml	21.0 ml	24.0 ml
hour	Fill to	30 ml	60 ml	90 ml	120 ml	150 ml	180 ml	210 ml	240 ml
17.5 mg	Medication	3.5 ml	7.0 ml	10.5 ml	14.0 ml	17.5 ml	21.0 ml	24.5 ml	28.0 ml
hour	Fill to	30 ml	60 ml	90 ml	120 mi	150 ml	180 ml	210 ml	240 ml
20.0 mg	Medication	4.0 ml	8.0 ml	12.0 ml	16.0 ml	20.0 ml	24.0 ml	28.0 ml	32.0 ml
hour	Fill to	30 ml	60 ml	90 ml	120 ml	150 ml	180 ml	210 ml	240 ml

HEART® Continuous Dosing Protocol @ 10 LPM

- a. Hope neb
- **Comments**: The Hope nebulizer is a high-output aerosol nebulizer that has an output rate of 25-50 mL per hour and a flow rate of 10 to 15 L per minute. It provides up to 8 hours of continuous nebulization and has a 200mL reservoir. The Hope nebulizer also has a port for Helium administration.
 - 1) With your lab partner, practice the assembly and disassembly of the Hope nebulizer.
 - 2) The following chart is the Dosing Chart for the Heart nebulizer. Dosage Charts are typically derived for Albuterol (5 mg/mL) and Normal Saline.

p/n: 11310 with reservoir									
Albuterol sulfate 5mg/ml Add medication and fill to: 25 ml		50 ml	75 ml	100 ml	125 ml	150 ml	175 ml	200 ml	
mg/Hr n	nL/HR	1 Hour	2 Hour	3 Hour	4 Hour	5 Hour	6 Hour	7 Hour	8 Hour
2.5	0.5	0.5	1	1.5	2	2.5	3	3.5	4
3	0.6	0.6	1.2	1.8	2.4	3	3.6	4.2	4.8
3.5	0.7	0.7	1.4	2.1	2.8	3.5	4.2	4.9	5.6
4	0.8	0.8	1.6	2.4	3.2	4	4.8	5.6	6.4
4.5	0.9	0.9	1.8	2.7	3.6	4.5	5.4	6.3	7.2
5	1	1	2	3	4	5	6	7	8
5.5	1.1	1.1	2.2	3.3	4.4	5.5	6.6	7.7	8.8
6	1.2	1.2	2.4	3.6	4.8	6	7.2	8.4	9.6
6.5	1.3	1.3	2.6	3.9	5.2	6.5	7.8	9.1	10.4
7/5	1.4	1.4	2.8	4.2	5.6	4 -	8.4	9.8	11.2
1.5	1.5	1.5	3	4.5	6	7.5	9	10.5	12
0	1.0	1.6	3.4	4.8	6.4	ð r	9.6	11.2	12.8
0.0	1.7	1.7	3.4	5.1	0.0	0.5	10.2	11.9	13.0
95	1.0	1.0	3.0	57	7.6	0.5	11.0	12.0	14.4
10	2	2	4	6	8	10	12	14	16
10.5	21	21	42	6.3	84	10.5	12.6	14.7	16.8
11	2.2	2.2	4.4	6.6	8.8	11	13.2	15.4	17.6
11.5	2.3	2.3	4.6	6.9	9.2	115	13.8	16.1	18.4
12	2.4	2.4	4.8	7.2	9.6	12	14.4	16.8	19.2
12.5	2.5	2.5	5	7.5	10	12.5	15	17.5	20
13	2.6	2.6	5.2	7.8	10.4	13	15.6	18.2	20.8
13.5	2.7	2.7	5.4	8.1	10.8	13.5	16.2	18.9	21.6
14	2.8	2.8	5.6	8.4	11.2	14	16.8	19.6	22.4
14.5	2.9	2.9	5.8	8.7	11.6	14.5	17.4	20.3	23.2
15	3	3	6	9	12	15	18	21	24
15.5	3.1	3.1	6.4	9.3	12.4	15.5	18.6	21.7	24.8
16 5	3.2	3.2	6.4	9.0	12.8	16	19.2	22.4	25.6
17	3.3	3.3	6.0	9.9	13.2	10.5	23.1	23.1	26.4
175	3.4	3.4	7	10.2	13.0	175	20.4	23.0	21.2
18	3.6	3.5	72	10.5	14	19	21.6	24.0	20 0
18.5	37	37	74	1111	14.4	185	22.2	25.9	20.0
19	3.8	3.8	7.6	114	15.2	19	22.8	26.6	30.4
19.5	3.9	3.9	7.8	117	15.6	195	23.4	27.3	31.2
20	4	4	8	12	16	20	24	28	32

HOPETM NEBULIZER DOSING CHART p/n: 11310 with reservoir

WORKSHEET

1. Using the Heart Nebulizer Dosage Chart, fill in the following chart with the correct amounts to give the prescribed therapy.

ORDER	ALBUTEROL (mL)	SALINE (mL)	L/MIN
Continuous nebulizer treatment with 5 mg albuterol per hour x 1 hr.			
Continuous nebulizer treatment with 2.5 mg albuterol per hour x 3 hrs.			

2. Using the Hope Nebulizer Dosage Chart, fill in the following chart with the correct amounts to give the prescribed therapy.

	ALBUTEROL	SALINE	
ORDER	(mL)	(mL)	L/MIN
Continuous nebulizer treatment with 5 mg albuterol per hour x 1 hr.			
Continuous nebulizer treatment with 2.5 mg albuterol per hour x 3 hrs.			