

Student Outcomes with safeMedicate passing benchmark of 100%: Can it be done?

CARRIE MILLER PHD, RN, CNE, CHSE, IBCLC

Acknowledgements

The founders of safeMedicate,

- Norman Woolley (Founder and CEO)
- Dr. Keith Weeks (Founder, President of Translational Research & CRDO)

Jody and Larry Hamm

- Without Jody and Larry....words cannot describe the level of responsiveness, patience, and endurance they have both demonstrated toward student learning! THANK YOU!

Presenter

Carrie Miller Ph.D., RN, CHSE, CNE, IBCLC: Director of Clinical Performance Lab (CPL)

Seattle University-College of Nursing

- CPL-20,000 sf
 - 24 bed hospital ward
 - 9 simulation suites
 - Debriefing rooms, classrooms
 - Computer lab for testing



Disclosures

There are not disclosures to present.

Learning Outcomes

Upon successful completion of this presentation, the learner will:

1. Discuss the importance of medication calculation safety within nursing education.
2. Describe the impact of the global pandemic and modified teaching strategies using safeMedicate.

Premise

- Majority of medication errors are related to challenges within the healthcare system.
- Despite safety precautions, scanners, and electronic health records, medication errors continue to occur.
- Over 10% of hospitalized patients in the USA, UK, and Canada suffer from medication errors each day. (Bickel, Villasecas, & Fluxa, 2020)
- Students feel ill-prepared to administer medications safely in the clinical setting. (Cleary-Forth & Leufer, 2020).
- Special attention is required when preparing medications. Different teaching strategies are needed. (Luokkamaki, et al., 2020).

Question bears to be asked...

How do you continue to teach medication calculation during a global pandemic when face-to-face teaching has been suspended, or drastically altered?

Our Quest

A four-year university in the Northwest region of the United States sought out means to address medication competency during the Covid-19 pandemic when face-to-face testing was not feasible.

Assumptions of safeMedicate Policy BEFORE Covid

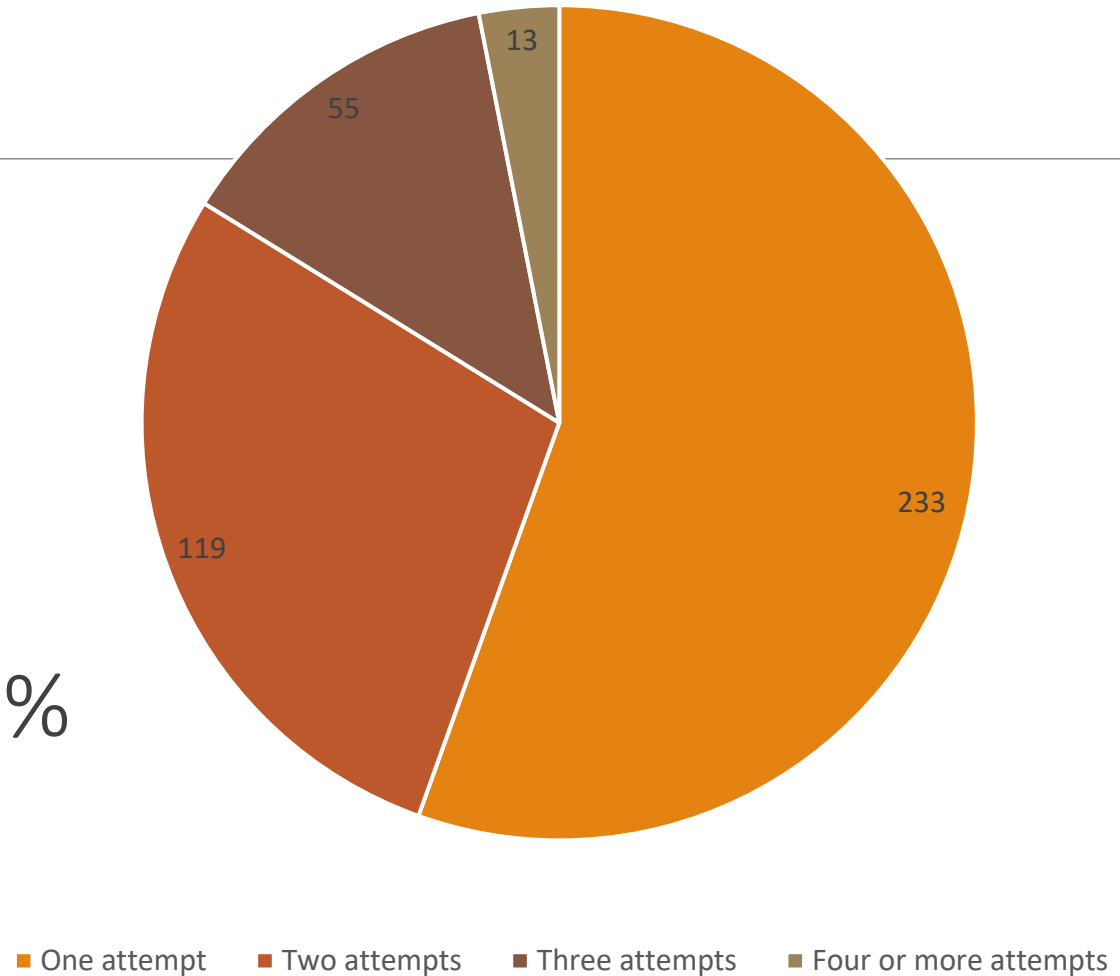
- Nursing Student Population
 - Three incoming cohorts
 - Matriculate 225 students per year
- Passing benchmark was 90%
- Proctored-all exams took place in the CPL or Testing Center for accommodations
- Three attempts to reach benchmark
- Exams set-up and administered by single SafeMedicate Administrator
- Courses using safeMedicate
 - Foundations, OB, Pediatrics, Adult Medical/Surgical

Assumptions of new policy/Design

- Remote Testing due to Covid
- All prep and testing resources are on College of Nursing Information Canvas page
- Managed and administrated by CPL
- Same courses
- Can take exams up to 3 times
- Goal is to achieve 100%
- Authentic Diagnostic Assessment
- Curriculum Committee approved
- Mandatory before entering into any type of clinical setting

Testers

N=425 testers
One attempt=55.7%
Two attempts= 28%
Three attempts= 13%
Four or more attempts= 3.7%



Following problems are examples of the types of errors that can occur.

In each example, the student scores were between 95-99%


Exemplars



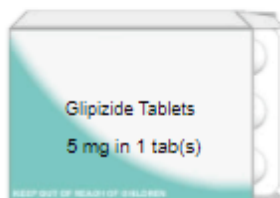
[Back to My Record](#)

QUESTION 4 - You answered this question INCORRECTLY

[CONTINUE](#)


Name
Sherwood Hewlett
Age
40 years
Height
165 cm
Bodyweight
100 kg (220 lbs)
BSA
2.21 m²
Allergies
NKDA
Presenting Complaint
Type 2 Diabetes Mellitus

ROUTINELY SCHEDULED MEDICINES			Date
Medicine (print generic name)			15/2/2021
Glipizide Tablets			
Administration Times			-
Dose			09:00
2.5 mg			
Route			Oral
Dose Calculation			-
Max Dose			20 mg/day
Indication			-
Type 2 Diabetes Mellitus	Prescriber's Signature	Pharm	-
	Dr. Jones	A.P.	-

**Drug Monograph**
For Use In safeMedicate Only**Drug Name**
Glipizide Tablets**Indication**
Type 2 Diabetes Mellitus**Route**
Oral**Dose**
2.5 mg once a day**Maximum Dose**
20 mg/day**Dispensed Dose**
5 mg in 1 tab(s)**Special Instructions**
-

CORRECT ANSWER

CALCULATED ANSWER
0.5

No Rounding Required → 0.5 tab(s)


YOUR ANSWER



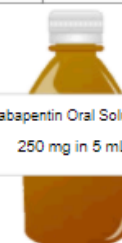
X

QUESTION 18 - You answered this question INCORRECTLY

[CONTINUE](#)


Name
Larae Papazian
Age
49 years
Height
162 cm
Bodyweight
77 kg (169.4 lbs)
BSA
1.9 m²
Allergies
NKDA
Presenting Complaint
Focal Seizures

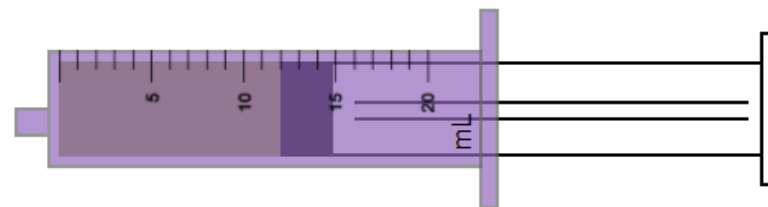
ROUTINELY SCHEDULED MEDICINES			Date
Medicine (print generic name)			15/2/2021
Gabapentin Oral Solution			
Administration Times			08:00
Dose			-
600 mg			
Route			ORAL
Dose Calculation			-
Max Dose			2400 mg per day
Indication			-
Focal Seizures	Prescriber's Signature	Pharm	-
	Dr. Jones	A.P.	-

Gabapentin Oral Solution
250 mg in 5 mL**Drug Monograph**
For Use In safeMedicate Only**Drug Name**
Gabapentin Oral Solution**Indication**
Focal Seizures**Route**
ORAL**Dose**
600 mg three times a day,
every eight hours**Maximum Dose**
2400 mg per day**Dispensed Dose**
250 mg in 5 mL**Special Instructions**
-

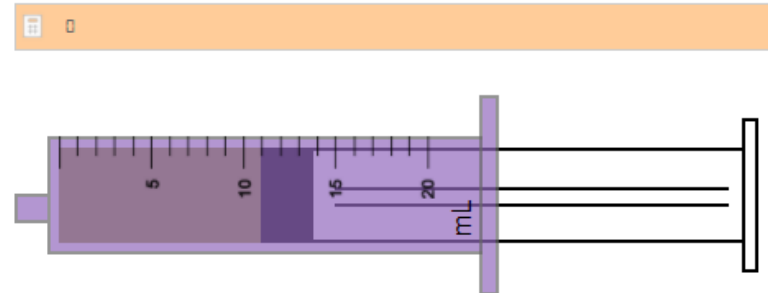
CORRECT ANSWER

CALCULATED ANSWER
12

No Rounding Required → 12 mL



YOUR ANSWER



X

QUESTION 23 - You answered this question INCORRECTLY

CONTINUE

Name
Maire Lenhart

Age
75 years

Height
158 cm

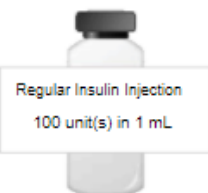
Bodyweight
57 kg (125.4 lbs)

BSA
1.6 m²

Allergies
NKDA

Presenting Complaint
Type 1 Diabetes Mellitus

ROUTINELY SCHEDULED MEDICINES			Date
Date	Medicine (print generic name)	Administration Times	15/2/2021
15/2/2021	Regular Insulin Injection	08:00	
Dose	13 unit(s)	Route	Subcutaneous Injection
Dose Calculation	-	Max Dose	13 units/dose
Indication	Type 1 Diabetes Mellitus	Prescriber's Signature	Dr. Jones
		Pharm	A.P.



Drug Monograph
For Use In safeMedicate Only

Drug Name
Regular Insulin Injection

Indication
Type 1 Diabetes Mellitus

Route
Subcutaneous Injection

Dose
13 unit(s) twice a day

Maximum Dose
13 units/dose

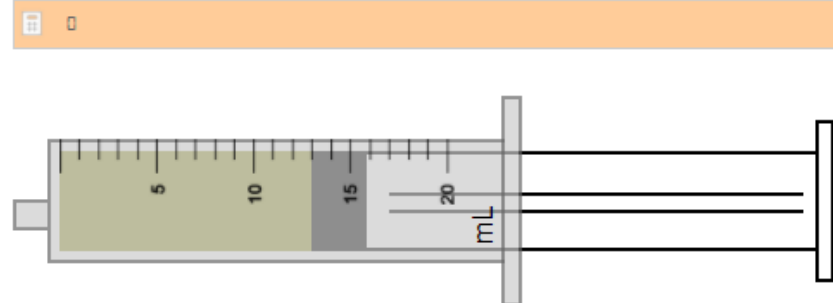
Dispensed Dose
100 unit(s) in 1 mL

Special Instructions
Administer before meals

CORRECT ANSWER



YOUR ANSWER



X

QUESTION 28 - You answered this question INCORRECTLY

CONTINUE

Name
Shin Shirah

Age
79 years

Height
164 cm

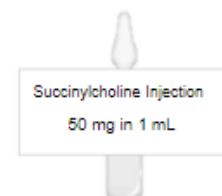
Bodyweight
38 kg (83.6 lbs)

BSA
1.3 m²

Allergies
NKDA

Presenting Complaint
Neuromuscular Blockade For Surgery

ONCE ONLY MEDICINES		
Date	Medicine (print generic name)	
15/2/2021	Succinylcholine Injection	
Dose	38 mg	Route
Dose Calculation	1 mg/kg	Intravenous Injection
Indication	Neuromuscular Blockade For Surgery	Max Dose
		150 mg
		Prescriber's Signature
		Dr. Jones
		Pharm
		A.P.



Drug Monograph
For Use In safeMedicate Only

Drug Name
Succinylcholine Injection

Indication
Neuromuscular Blockade For Surgery

Route
Intravenous Injection

Dose
1 mg/kg once a day

Maximum Dose
150 mg

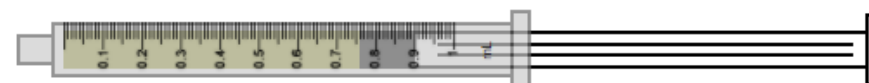
Dispensed Dose
50 mg in 1 mL

Special Instructions
Administer over 20 seconds

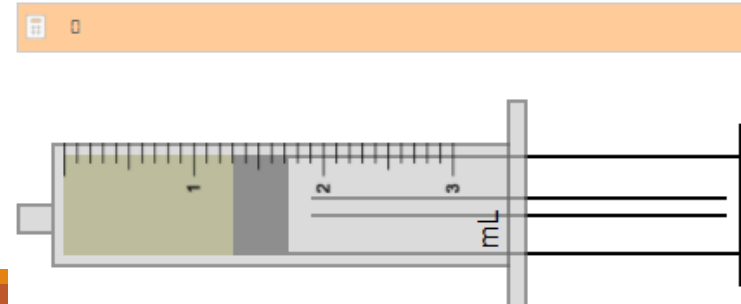
CORRECT ANSWER

CALCULATED ANSWER
0.76

No Rounding Required → 0.76 mL



YOUR ANSWER



X

QUESTION 16 - You answered this question INCORRECTLY

[CONTINUE](#)

DATE	TIME	VOLUME	DOSE	PREPARED BY	ADMINISTERED BY
		200 mL	200 mg		

MEDICATION LABEL
200 mg Labetalol
in
200 mL Sodium Chloride
0.9%

Medication Datasheet
Dose: 2 mg per minute
Rate: Not to exceed 2 mg
per min(s)

CORRECT ANSWER

CALCULATING THE RATE

DOSE FORMULA	PREPARED	TIME CONV.	PRODUCTS	ANSWER
$\frac{2 \text{ mg} \times 200 \text{ mL} \times 60 \text{ min(s)}}{\text{min(s)} \times 200 \text{ mg} \times 1 \text{ hr}}$			$= \frac{24000 \text{ mL}}{200 \text{ hr}}$	$= 120 \text{ mL/hr}$

CALCULATED ANSWER
120

No Rounding Required

120 mL/hr

SETTING THE PUMP



YOUR ANSWER

CALCULATING THE RATE

DOSE FORMULA	PREPARED	TIME CONV.	PRODUCTS	ANSWER
$\frac{2 \text{ mg} \times 200 \text{ mL} \times 60 \text{ min(s)}}{\text{min(s)} \times 200 \text{ mg} \times 1 \text{ hr}}$			$= \frac{4000 \text{ mL}}{200 \text{ hr}}$	$= 120 \text{ mL/hr}$



YOU INDICATED THAT THE PRESCRIBED DOSE, PATIENT & MEDICATION DETAILS ARE ACCURATE



THE PATIENT IDENTITY BRACELET WAS CHECKED BEFORE ADMINISTRATION

SETTING THE PUMP



QUESTION 6 - You answered this question INCORRECTLY

[CONTINUE](#)

DATE	TIME	VOLUME	DOSE	PREPARED BY	ADMINISTERED BY
			500 mg		

MEDICATION LABEL
500 mg Cefazolin
in
50 mL 5% Dextrose

Medication Datasheet
Dose: 250 - 1500 mg every 6
- 8 hour(s)
Rate: Administer over 30
min(s)

CORRECT ANSWER

CALCULATING THE RATE

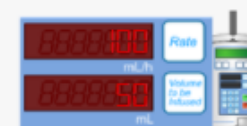
VOLUME / TIME	TIME CONV.	PRODUCTS	ANSWER
$\frac{50 \text{ mL} \times 60 \text{ min(s)}}{30 \text{ min(s)} \times 1 \text{ hr}}$		$= \frac{3000 \text{ mL}}{30 \text{ hr}}$	$= 100 \text{ mL/hr}$

CALCULATED ANSWER
100

No Rounding Required

100 mL/hr

SETTING THE PUMP



YOUR ANSWER

CALCULATING THE RATE

PREPARED	TIME CONV.	PRODUCTS	ANSWER
$\frac{50 \text{ mL} \times 60 \text{ min(s)}}{30 \text{ min(s)} \times 1 \text{ hr}}$		$= \frac{3000 \text{ mL}}{30 \text{ hr}}$	$= 100 \text{ mL/hr}$



YOU INDICATED THAT THE PRESCRIBED DOSE, PATIENT & MEDICATION DETAILS ARE ACCURATE



THE PATIENT IDENTITY BRACELET WAS CHECKED BEFORE ADMINISTRATION

SETTING THE PUMP



QUESTION 19 - You answered this question INCORRECTLY

[CONTINUE](#)

WEIGHT	VOLUME	DOSE
95	250 mL	250 mg

For this patient administer at 5 mcg/kg/min(s)

MEDICATION LABEL
250 mg Dobutamine
in
250 mL Sodium Chloride
0.9%

Medication Datasheet
Dose: 2.5 - 10 mcg/kg/min
Rate: -

CORRECT ANSWER

CALCULATING THE RATE

DOSE FORMULA	PATIENT WEIGHT	PREPARED	SI UNIT CONV.	TIME CONV.	PRODUCTS	ANSWER
$\frac{5 \text{ mcg} \times 95 \text{ kg} \times 250 \text{ mL} \times 1 \text{ mg} \times 60 \text{ min(s)}}{\text{kg min(s)} \times 250 \text{ mg} \times 1000 \text{ mcg} \times 1 \text{ hr}}$					$\frac{7125000 \text{ mL}}{250000 \text{ hr}}$	28.5 mL/hr

CALCULATED ANSWER
28.5

No Rounding Required



28.5 mL/hr

SETTING THE PUMP



YOUR ANSWER

CALCULATING THE RATE

DOSE FORMULA	PATIENT WEIGHT	PREPARED	SI UNIT CONV.	TIME CONV.	PRODUCTS	ANSWER
$\frac{5 \text{ mcg} \times 95 \text{ kg} \times 250 \text{ mL} \times 1 \text{ mg} \times 60 \text{ min(s)}}{\text{kg min(s)} \times 250 \text{ mg} \times 1000 \text{ mcg} \times 1 \text{ hr}}$					$\frac{7125000 \text{ mL}}{250000 \text{ hr}}$	2.9 mL/hr



YOU INDICATED THAT THE PRESCRIBED DOSE, PATIENT & MEDICATION DETAILS ARE ACCURATE



THE PATIENT IDENTITY BRACELET WAS CHECKED BEFORE ADMINISTRATION

SETTING THE PUMP



X

QUESTION 1 - You answered this question INCORRECTLY

[CONTINUE](#)

WEIGHT	DOSE
87	1 g

MEDICATION LABEL
1 g Vancomycin
in
250 mL 5% Dextrose

Medication Datasheet
Dose: 1 grams every 12
hours
Rate: Administer 1 grams
over 2 hour(s)

CORRECT ANSWER

CALCULATING THE RATE

VOLUME / TIME	ANSWER
$\frac{250 \text{ mL}}{2 \text{ hr}}$	125 mL/hr

CALCULATED ANSWER
125

No Rounding Required



125 mL/hr

SETTING THE PUMP



YOUR ANSWER

CALCULATING THE RATE

PREPARED	ANSWER
$\frac{250 \text{ mL}}{1 \text{ hr}}$	250 mL/hr



YOU INDICATED THAT THE PRESCRIBED DOSE, PATIENT & MEDICATION DETAILS ARE ACCURATE



THE PATIENT IDENTITY BRACELET WAS CHECKED BEFORE ADMINISTRATION


SETTING THE PUMP



X

QUESTION 17 - You answered this question INCORRECTLY

CONTINUE



WGT 64 KG

VOLUME 250 mL

DOSE 1000 mg

For this patient administer at 500 mcg/kg/hr

MEDICATION LABEL
1000 mg Aminophylline
in
250 mL Sodium Chloride
0.9%

Medication Datasheet
Dose: 300 - 800 mcg/kg/hr
Rate: Not to exceed 25 mg
per min(s)

CORRECT ANSWER

CALCULATING THE RATE

DOSE FORMULA	PATIENT WEIGHT	PREPARED	SI UNIT CONV.	PRODUCTS	ANSWER
500 mcg × kg × hr	64	250 mL × 1000 mg	1 mg × 1000 mcg	8000000 mL = 1000000 hr	8 mL/hr

CALCULATED ANSWER
8

No Rounding Required

8 mL/hr

SETTING THE PUMP



YOUR ANSWER

CALCULATING THE RATE

DOSE FORMULA	PATIENT WEIGHT	PREPARED	SI UNIT CONV.	PRODUCTS	ANSWER
500 mcg × kg × hr	64	250 mL × 1000 mg	2 mg × 1000 mcg	1800000 mL = 1000000 hr	18 mL/hr



YOU INDICATED THAT THE PRESCRIBED DOSE, PATIENT & MEDICATION DETAILS ARE ACCURATE

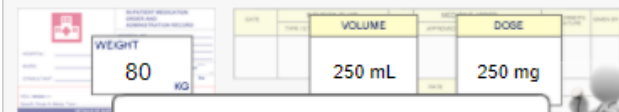
THE PATIENT IDENTITY BRACELET WAS CHECKED BEFORE ADMINISTRATION

SETTING THE PUMP



QUESTION 19 - You answered this question INCORRECTLY

CONTINUE



WGT 80 KG

VOLUME 250 mL

DOSE 250 mg

For this patient administer at 2.5 mcg/kg/min(s)

MEDICATION LABEL
250 mg Dobutamine
in
250 mL Sodium Chloride
0.9%

Medication Datasheet
Dose: 2.5 - 10 mcg/kg/min
Rate: -

CORRECT ANSWER

CALCULATING THE RATE

DOSE FORMULA	PATIENT WEIGHT	PREPARED	SI UNIT CONV.	TIME CONV.	PRODUCTS	ANSWER
2.5 mcg × kg × min(s)	80	250 mL × 1000 mg	1 mg × 1000 mcg	60 min(s) × 1 hr	3000000 mL = 250000 hr	12 mL/hr

CALCULATED ANSWER
12

No Rounding Required

12 mL/hr

SETTING THE PUMP



YOUR ANSWER

CALCULATING THE RATE

DOSE FORMULA	PATIENT WEIGHT	SI UNIT CONV.	PREPARED	PRODUCTS	ANSWER
2.5 mcg × kg × hr	80	1 mg × 1000 mcg	250 mL × 1000 mg	50000 mL = 250000 hr	0.2 mL/hr



YOU INDICATED THAT THE PRESCRIBED DOSE, PATIENT & MEDICATION DETAILS ARE ACCURATE

THE PATIENT IDENTITY BRACELET WAS CHECKED BEFORE ADMINISTRATION

SETTING THE PUMP



QUESTION 8 - You answered this question INCORRECTLY

CONTINUE

WEIGHT
70 kg

DOSE
70 mg

MEDICATION LABEL
70 mg Zidovudine
in
50 mL 5% Dextrose

Medication Datasheet
Dose: 1 mg/kg every 6
hours
Rate: Administer over 1
hour(s)

CORRECT ANSWER

CONFIRMING THE PRESCRIBED DOSE

DOSE FORMULA	PATIENT WEIGHT	ANSWER
1 mg × 70 kg kg		70 mg

CALCULATING THE RATE

VOLUME / TIME	ANSWER
50 mL 1 hr	50 mL/hr

CALCULATED ANSWER
50

No Rounding Required → 50 mL/hr

SETTING THE PUMP



YOUR ANSWER

CONFIRMING THE PRESCRIBED DOSE

DOSE FORMULA	PATIENT WEIGHT	ANSWER
1 mg × 70 kg kg		70 kg

CALCULATING THE RATE

PREPARED	ANSWER
50 mL 1 hr	50 mL/hr

YOU INDICATED THAT THE PRESCRIBED DOSE, PATIENT & MEDICATION DETAILS ARE ACCURATE

THE PATIENT IDENTITY BRACELET WAS CHECKED BEFORE ADMINISTRATION

SETTING THE PUMP



Advanced Skills

Back to My Record

QUESTION 12 - You answered this question INCORRECTLY

CONTINUE

WEIGHT
75 kg

VOLUME	DOSE
125 mL	125 mg

MEDICATION LABEL
125 mg Diltiazem
in
125 mL Pre-Prepared
Solution for Infusion

Medication Datasheet
Dose: 10 mg per hour
Rate: -

CORRECT ANSWER

CALCULATING THE RATE

DOSE FORMULA	PREPARED	PRODUCTS	ANSWER
10 mg × 125 mL hr × 125 mg		1250 mL 125 hr	10 mL/hr

CALCULATED ANSWER
10

No Rounding Required → 10 mL/hr

SETTING THE PUMP



YOUR ANSWER

CALCULATING THE RATE

DOSE FORMULA	PREPARED	PRODUCTS	ANSWER
10 mg × 125 mL hr × 125 mg		1250 mL 125 mg	10 mL/hr

YOU INDICATED THAT THE PRESCRIBED DOSE, PATIENT & MEDICATION DETAILS ARE ACCURATE

THE PATIENT IDENTITY BRACELET WAS CHECKED BEFORE ADMINISTRATION

SETTING THE PUMP



QUESTION 9 - You answered this question INCORRECTLY

CONTINUE



Bodyweight: 59.4 lbs
Age: 8 years

Child Specific Age Group
Drug Name
Clindamycin Injection
Dose
30mg/kg/day in 4 divided dose(s)
every 6 hours
Maximum Dose
40 mg/kg/day in 4 divided doses,
every 6 hours

Weight (kg)	Dose (mg)
10.00	300.00
12.00	360.00
14.00	420.00
16.00	480.00
18.00	540.00
20.00	600.00

Clindamycin Injection
150 mg in 1 mL

CORRECT ANSWER

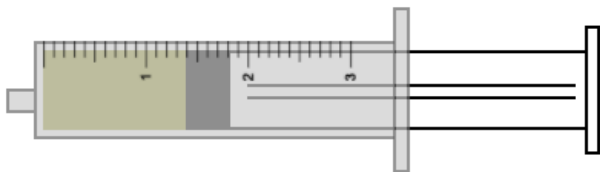
$$59.4 \text{ lbs} \div 2.2 \text{ conv. lbs/kg} = 27 \text{ kg}$$

$$30 \text{ mg/kg/day} \times 27 \text{ kg} = 810 \text{ mg/day}$$

$$810 \text{ mg/day} \div 4 \text{ doses/day} = 202.5 \text{ mg/dose}$$

$$\frac{202.5 \text{ mg}}{150 \text{ mg}} \times 1 \text{ mL} = 1.35 \text{ mL}$$

Answer Requires Rounding



YOUR ANSWER

$$59.4 \text{ lbs} \div 2.2 \text{ conv. lbs/kg} = 27 \text{ kg}$$

$$27 \text{ kg} \times 30 \text{ mg/kg/day} = 810 \text{ mg/day}$$

$$810 \text{ mg/day} \div 4 \text{ doses/day} = 202.5 \text{ mg/dose}$$

The user appropriately indicated that the ordered dose was accurate.

$$\frac{202.5 \text{ mg}}{150 \text{ mg}} \times 1 \text{ mL} = 0.81 \text{ mL}$$

0.81 mL is incorrect.



X

QUESTION 10 - You answered this question INCORRECTLY

CONTINUE



Bodyweight: 85.36 lbs
Age: 12 years

Child Specific Age Group
Drug Name
Tobramycin Injection
Dose
7.5mg/kg/day in 3 divided dose(s)
every 8 hours
Maximum Dose
7.5 mg/kg/day in 3 divided doses,
every 8 hours

Weight (kg)	Dose (mg)
10.00	75.00
12.00	90.00
14.00	105.00
16.00	120.00
18.00	135.00
20.00	150.00

Tobramycin Injection
40 mg in 1 mL

CORRECT ANSWER

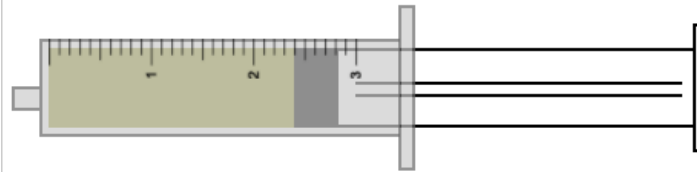
$$85.36 \text{ lbs} \div 2.2 \text{ conv. lbs/kg} = 38.8 \text{ kg}$$

$$7.5 \text{ mg/kg/day} \times 38.8 \text{ kg} = 291 \text{ mg/day}$$

$$291 \text{ mg/day} \div 3 \text{ doses/day} = 97 \text{ mg/dose}$$

$$\frac{97 \text{ mg}}{40 \text{ mg}} \times 1 \text{ mL} = 2.425 \text{ mL}$$

Answer Requires Rounding



YOUR ANSWER

$$85.36 \text{ lbs} \div 2.2 \text{ conv. lbs/kg} = 38.8 \text{ kg}$$

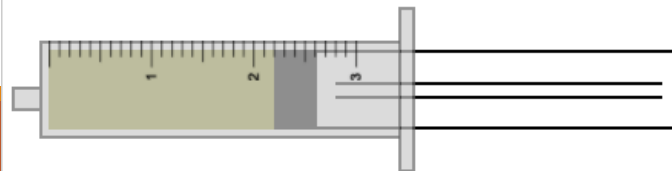
$$7.5 \text{ mg/kg/day} \times 38.8 \text{ kg} = 291 \text{ mg/day}$$

$$291 \text{ mg/day} \div 3 \text{ doses/day} = 97 \text{ mg/dose}$$

The user appropriately indicated that the ordered dose was accurate.

$$\frac{97 \text{ mg}}{40 \text{ mg}} \times 1 \text{ mL} = 2.4 \text{ mL}$$

2.4 mL is incorrect.



X

Remediation

Describe the error(s) you made on your safeMedicate exam.

- “The error I made in the last attempt of the exam was using the correct unit of measurement of mg instead of the correct measurement of g.”

Why do you feel these errors occurred?

- “I believe I made this error, because I felt pressure since it was my last attempt to get 100% on the exam and had less than 30 minutes before the deadline to accomplish it.”

What will you do in the future to ensure they do not occur again?

- “In the future, I will ensure to manage my time better just in case I do need to attempt the exam multiple times and take my time when I do take the exam to ensure proper units of measurement and calculations are correct according to the order.”

Most common reason for errors...

Why did these errors occur?

- “Apart from the first question mistake of writing the wrong value, the other mistakes that occurred were because I simply did not take enough time/put enough focus on all the details. All the mistakes that I made were about the units of the equation, and I did not choose the wrong ones intentionally as then I would have also written different answers/numbers in their place if so.”
- “I believe these mistakes occurred because I was trying to finish the exam fastly and because of that, I did not really focus enough on the details or spent time reviewing my answers at the end.”
- “I instead skimmed the units available and chose the one that first caught my eye as the correct one but was in fact incorrect. For instance, I accidentally chose mg/min but didn't notice that it did not contain the 'c' in the mcg unit.”

Narratives

“I understand that a high dose of insulin can be fatal to a patient. I was about to make a mistake by giving the dose, but now I know to never do that.”

“I was under the impression insulin was only double checked by a second nurse with pediatric patients, but I understand the need to be double checked by multiple nurses.”

“I understand the error was that I had selected an incorrect syringe. I assumed that because the calculations had units, I selected the syringe with units instead of the resulting mL syringe that was needed. I understand and will retest.”

General Themes

- Time management
- Lack of attention to detail
- Most common error...
 - Wrong syringe for insulin

Next Steps...Discussion and Thoughts

- Policy as we learn to live with Covid
 - Proctored?
 - Passing Benchmark?
 - # of Attempts?
- On 02-18-2021: Curriculum voted to maintain current policy of 100% pass rate, three attempts. Will return to proctored environment.

References

- Bickel, A. E., Villasecas, V. X., & Fluxá, P. J. (2020). Characterization of adverse events occurring during nursing clinical rotations: A descriptive study. *Nurse education today*, 84, 104224.
- Cleary-Holdforth, J., & Leufer, T. (2020). Senior Nursing Students' Perceptions of Their Readiness for Oral Medication Administration Prior to Final Year Internship: A Quantitative Descriptive Pilot Study. *Dimensions of Critical Care Nursing*, 39(1), 23-32.
- Luokkamäki, S., Härkänen, M., Saano, S., & Vehviläinen-Julkunen, K. (2020). Registered Nurses' medication administration skills: a systematic review. *Scandinavian journal of caring sciences*.
- Unidad de Evaluación de Tecnologías Sanitarias Subsecretaría de Redes Asistenciales
Revisión de estrategias efectivas para la seguridad de la atención del paciente
<https://www.minsal.cl/portal/url/item/71a8aa81f28d41ece04001011f010aa1.pdf> (2008)