

## Making the Connection: INTEGRATIVE EXERCISE

## COST SYSTEM CHOICES, BUDGETING, AND VARIANCE ANALYSES FOR SACRED HEART HOSPITAL

## The Two Cost Systems:

1. Hospital-wide rate (current system)
  - = Total hospital nursing costs/Total patients
  - = \$300,000/2,000 total patients
  - = \$150 per patient
2. Current rate  $\times$  Number of service line patients:
  - \$150  $\times$  1,000 ER patients = \$150,000 assigned to the ER line
  - \$150  $\times$  1,000 OR patients = \$150,000 assigned to the OR line
  - Therefore, the current system assigns nursing costs equally because the ER and OR have the same number of patients.
3. Costs assigned to OR/Number of OR nursing hours:
  - \$150,000/5,000 = \$30/OR hour
4. Hospital-wide rate (vital signs system)
  - = Total hospital nursing costs/Total number of vital sign checks
  - = \$300,000/6,000 total vital signs checks
  - = \$50 per vital sign check

Thus, the variable cost per unit for canoes is \$300 (\$200 + \$100) and the total fixed cost for canoes is \$80,000 (\$60,000 + \$ 20,000).

- 5. Vital signs rate  $\times$  Number of vital sign checks:**
- \$50  $\times$  2,000 ER vital sign checks = \$100,000 assigned to the ER line**
- \$50  $\times$  4,000 OR vital sign checks = \$200,000 assigned to the OR line**
- Therefore, the vital signs system assigns twice as much of nursing costs to the OR because the OR requires twice as many vital sign checks of its patients as the ER does of its patients.**
- 6. Costs assigned to OR/Number of OR nursing hours:**
- \$200,000/5,000 = \$40 per OR hour**

**Budgeting and Variance Analysis:****7. a. Flexible budget variance**

$$\begin{aligned}\text{Flexible budget variance} &= \text{Flexible budget costs} - \text{Actual costs} \\ &= (\text{Number of actual surgeries} \times \text{OR nursing hrs allowed per surgery} \times \\ &\quad \text{Standard cost per surgery}) - \text{Actual cost} \\ &= (950 \times 5 \times \$30) - \$190,000 \\ &= \$142,500 - \$190,000 \\ &= \$47,500 \text{ U Flexible Budget Variance}\end{aligned}$$

**b. Price variance**

$$\begin{aligned}&= (\text{Standard price} - \text{Actual price}) \times \text{Actual quantity of OR nursing hrs} \\ &= (\$30 - \$38) \times 5,000^* \\ &= \$40,000 \text{ U Price Variance}\end{aligned}$$

**c. Efficiency variance**

$$\begin{aligned}&= (\text{Standard quantity} - \text{Actual quantity}) \times \text{Standard price} \\ &= [(950 \times 5) - 5,000] \times \$30 \\ &= \$7,500 \text{ U Efficiency Variance}\end{aligned}$$

$$^*\$190,000/5,000 = \$38 \text{ per hour}$$

**8. a. Flexible budget variance**

$$\begin{aligned}\text{Flexible budget variance} &= \text{Flexible budget costs} - \text{Actual costs} \\ &= (\text{Number of actual surgeries} \times \text{OR nursing hrs allowed per surgery} \times \\ &\quad \text{Standard cost per surgery}) - \text{Actual cost} \\ &= (950 \times 5 \times \$40) - \$190,000 \\ &= \$190,000 - \$190,000 \\ &= \$0 \text{ Flexible Budget Variance}\end{aligned}$$

**b. Price variance**

$$\begin{aligned}&= (\text{Standard price} - \text{Actual price}) \times \text{Actual quantity of OR nursing hrs} \\ &= (\$40 - \$38) \times 5,000 \\ &= \$10,000 \text{ F Price Variance}\end{aligned}$$

**c. Efficiency variance**

$$\begin{aligned}&= (\text{Standard quantity} - \text{Actual quantity}) \times \text{Standard price} \\ &= [(950 \times 5) - 5,000] \times \$40 \\ &= \$10,000 \text{ U Efficiency Variance}\end{aligned}$$

**9. Although answers will vary, most students likely will choose the vital signs cost systems for numerous reasons, some of which should be included in the following discussion. First, if the experienced nurses are correct, then the vital signs cost system should more accurately allocate costs to service lines because its cost allocation base (number of times a patient's vital signs are checked) appears more likely to represent the underlying cause of nursing costs as compared to the current cost system's allocation base (number of patients). At this point in the discussion, it is helpful to emphasize the importance of designing a cost system that uses allocation bases that represent the causal drivers of costs. Second, while both systems use only one driver and, therefore, should be equally costly to operate, it is likely that switching from one cost system to another will be costly at first, both in terms of time, money, and "buy-in" from SHH managers and employees. Third, while the vital signs appears to be a more accurate cost system, it is possible that additional conversations and analyses should be conducted to determine whether a more advanced version of the vital signs cost system would produce even more accurate costs that would prove beneficial to decision making. Finally, the more accurate vital signs system should generate a more accurate estimate of the cost per nursing hour, which affects the budgeting process, because the portion of costs allocated to each service line, ER and OR, should be more accurate with the vital signs system. As a result, as discussed in the final requirement, the flexible budget variance (including the price and efficiency variances) should produce more accurate and meaningful information with the vital signs system because of its use of a more accurate standard cost estimate as a key input into the budgeting process.**

**10.**

- **The overall current system's OR flexible budget variance (\$47,500) is very large and unfavorable, suggesting that the sub-variances (price variance and efficiency variance) should be calculated.**
- **The current system's OR price variance (\$40,000) is very large and unfavorable, suggesting that the nursing hiring manager negotiated a bad price and that nursing hour pay cuts might be necessary.**
- **The current system's OR efficiency variance (\$7,500) is moderate and unfavorable, suggesting that the operating room manager used too many OR nursing hours for the actual number of surgeries performed.**
- **The overall vital signs' OR flexible budget variance is zero and suggests that nothing needs to be investigated further.**
- **The vital signs' OR price variance (\$10,000) is large and favorable, suggesting that the nursing hiring manager negotiated a good price.**
- **The vital signs' OR efficiency variance (\$10,000) is large and unfavorable, suggesting that the operating room manager used too many OR nursing hours for the actual number of surgeries performed. In addition, it would be unwise had Jack decided to end the variance analysis after seeing that the**

**10. (Continued)**

**flexible budget variance was zero. Only after continuing on with the analysis to calculate the price and efficiency variances would Jack realize that the zero flexible budget variance was the result of two large offsetting variances, both of which likely require further investigation and attention.**

- **Overall, the two cost systems produce different reported costs of the two service lines, ER and OR. The current system assigns nursing costs equally because the ER and OR have the same number of patients. Alternately, the vital signs system assigns twice as much of nursing costs to the OR because the OR requires twice as many vital sign checks of its patients as the ER does of its patients. In addition, the two systems produce different estimates of the cost incurred by the hospital per OR nursing hour. When used as the standard costs in the budgeting process, these different reported costs, in turn, lead to very different flexible budget variances and price and efficiency variances for the OR service line. Therefore, the managerial accountant should be very careful when constructing a cost system and be sure that the chosen allocation bases are as accurate as possible to match the underlying resource consumption patterns of the business environment. Choosing different cost allocation bases usually will result in differences in reported service line costliness and various variances, which can have ramifications for numerous managers (e.g., purchasing managers responsible for price variances, production managers responsible for efficiency variances, other managers responsible for making service line mix decisions, etc.).**