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# Suitability of Capillary Blood Glucose Analysis in Patients Receiving Vasopressors

Myra F. Ellis, Kesi Benjamin, Morgan Cornell, Kelsey Decker, Debra Farrell, Lynn McGugan, Gloria P. Porter, Helen Shearin, Yanfang Zhao and Bradi B. Granger

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AMERICAN ASSOCIATION of CRITICAL-CARE NURSES



# Suitability of Capillary Blood Glucose Analysis in Patients Receiving Vasopressors

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### Notice to CNE enrollees:

A closed-book, multiple-choice examination following this article tests your understanding of the following objectives:

- 1. Identify the factors that can affect the accuracy of blood sugar testing.
- 2. Discuss what blood glucose testing method is acceptable to use for patients with less than 2, or more than 2 vasopressors.
- 3. Describe the potential consequences of using an inaccurate blood glucose testing method.

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**Background** Glycemic control in critically ill patients decreases infection and mortality. Patients receiving vasopressors have altered peripheral perfusion, which may affect accuracy of capillary blood glucose values measured with point-of-care devices. <u>Objectives</u> To compare capillary and arterial glucose values measured via point-of-care testing (POCT) with arterial glucose values measured via clinical chemistry laboratory testing (CCLT) in patients after cardiothoracic surgery. To determine if vasopressors or diminished peripheral perfusion influence the accuracy of POCT values.

Methods In a prospective, convenience sample of 50 adult postoperative cardiothoracic patients receiving insulin and vasopressors, 162 samples were obtained simultaneously from capillary and arterial sites during insulin infusion and tested via both POCT and CCLT. Clarke error grid analysis and ISO 15197 were used to analyze level of agreement. Two-way analysis of variance was used to analyze differences in glucose values with respect to vasopressor use and peripheral perfusion. **Results** An unacceptable level of agreement was found between the capillary POCT results and arterial CCLT results (only 88.3%) of values fell in zone A, or within the ISO 15197 tolerance bands). Arterial POCT results showed acceptable (94.4%) agreement with CCLT results. Vasopressor use had a significant effect on the accuracy of arterial blood glucose values (F=15.01; P<.001). **Conclusions** Even when the more accurate POCT with arterial blood is used, blood glucose values are significantly less accurate in patients receiving more than 2 vasopressors than in patients receiving fewer vasopressors. CCLT may be safer for titrating insulin doses in these patients. (American Journal of Critical Care. 2013;22:423-430)

lycemic control is an essential part of caring for critically ill patients and improves outcomes.<sup>1</sup> Hyperglycemia is associated with increased morbidity and mortality in diabetic and nondiabetic patients after cardiac surgery, and maintaining glucose levels below 180 mg/dL (multiply by 0.0555 to convert to millimoles per liter) reduces mortality and morbidity, decreases the incidence of wound infections, reduces hospital length of stay, and enhances long-term survival. The use of intravenous insulin infusion to maintain an early postoperative glucose level of 180 mg/dL or less while avoiding hypoglycemia is a class 1b recommendation for patients after cardiac surgery, according to the 2011 American College of Cardiology Foundation/ American Heart Association (ACCF/AHA) guideline for coronary artery bypass surgery.<sup>23</sup>

The accuracy of blood glucose measurements is paramount to nurses' ability to manage and control blood glucose levels. Patients receiving insulin infusions require frequent blood glucose measurements for glycemic control. These measurements are made at least every 2 hours and generally every hour because of the frequent changes in blood glucose values and to achieve the benefits of glycemic control. Blood glucose measurement by using a finger stick to obtain capillary samples is 1 way to minimize

Capillary blood glucose measurements are accurate in normotensive patients. blood sampling from arterial catheters in patients receiving insulin infusions. Additionally, the capillary glucose check is beneficial as it is a task that can be safely delegated to a nursing care assistant.

Capillary blood glucose measurements are accurate in normotensive patients and correlate well with measurements from samples tested in a clinical chemistry laboratory.<sup>4</sup>

However, in critically ill patients, altered blood pressure affects the accuracy of blood glucose values measured by using point-of-care testing (POCT).<sup>5,6</sup> In addition, in patients receiving vasopressors, the blood pressure may be normalized (normotensive)

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**Corresponding author:** Bradi B. Granger, DUMC 3322, Trent Drive, Durham, NC 27710 (e-mail: Bradi.granger @dm.duke.edu). by arterial measurement, but peripheral perfusion may be altered by the vasoconstrictor effects of the medication.<sup>7</sup> Altered peripheral perfusion may affect the accuracy of capillary blood glucose measurements; however, actual best practice for patients after cardiac surgery is not known. One study<sup>8</sup> of 50 postoperative cardiovascular surgery patients demonstrated high correlation in capillary glucose sampling, in comparison with arterial and venous sampling, whereas other studies have shown poor correlation in patients with cardiopulmonary resuscitation,<sup>9</sup> shock states,<sup>7,10</sup> presence of edema,<sup>11</sup> and after major surgery.<sup>11,12</sup> The small sample sizes in these studies and the conflicting results support the need for further study in populations with compromised peripheral perfusion.

The standard of practice for continuous insulin infusions in many intensive care units is hourly monitoring of blood glucose levels, particularly in the acute postoperative phase. Standard procedure, however, does not dictate method, and as a result either arterial or capillary blood samples or both may be collected. Samples from both finger sticks and arterial catheters may be obtained concomitantly for purposes of validation; however, such validation is not required and is a nurse-dependent variation in care. Patients are typically admitted to the cardiothoracic intensive care unit from the operating room already receiving insulin infusions and vasoactive medications. During early postoperative recovery, frequent titration of both insulin and vasopressor infusions occurs<sup>2</sup>; however, studies to date have not consistently supported the accuracy of capillary blood glucose testing in this setting or the correlation of arterial with capillary blood glucose values in these critically ill patients. In order to answer the research question regarding accuracy and correlation in the setting of high doses of vasopressor drugs, early access to temporally related samples is required. The purpose of this study was to compare blood glucose measurements obtained from

POCT of capillary and arterial blood samples with measurements made in the clinical chemistry laboratory on arterial blood samples from patients after cardiothoracic surgery, and to determine if use of vasopressor medications or peripheral perfusion influenced the POCT values.

#### Methods \_

#### **Design, Setting and Sample**

This prospective, case-controlled study was conducted in the 20-bed cardiothoracic intensive care unit (CTICU) at a large academic tertiary care hospital. The unit provides care for patients undergoing cardiac and thoracic surgery, including bypass grafting, valve surgery, heart and lung transplant, implantation of ventricular assist devices, and thoracic surgeries. A convenience sample of 50 adult postoperative cardiothoracic patients receiving insulin and vasopressors was prospectively enrolled. All participants provided informed consent, and the study was approved by the institutional review board.

#### **Measures**

Prospective data collection of all study variables occurred for participants upon admission to the CTICU and each time thereafter that a basic metabolic panel was ordered while the patient was receiving a continuous insulin infusion. Variables assessed included the following: pharmacotherapy, vital signs, and blood samples obtained simultaneously from arterial and capillary sites. Samples were tested by using POCT and clinical chemistry laboratory testing (CCLT) as the "gold standard." The samples sent to the clinical laboratory were run on a Beckman Coulter Unicel DxC 600/800 by using the oxygen consumption rate method.

Vasopressor medications included in the evaluation for this study were dopamine, epinephrine, norepinephrine, phenylephrine, and vasopressin. The quality of peripheral tissue perfusion was assessed by standard scales for pulse (0-4), capillary refill (<3 sec, >3 sec), color (pink-mottled), and temperature (hot-cold) of the extremity used for study samples. The scales used for these assessments in this study are a part of the usual care procedures for all nurses certified to care for patients in the CTICU. The competency-based orientation process accounts for reliability, interobserver variation, and intraobserver variation for these scales. The temperature of the extremities was categorized into 2 groups (cool or warm) on the basis of the distribution of the data and the lack of variability among participants across groups. The documented temperature of the extremities fell into 1 of these 2

categories for all participants. The categories were coded as 1 = cold or cool and 2 = warm or hot. These categories were used as the measure of peripheral tissue perfusion for comparison in the study.

#### **Study Procedures**

Demographics and medical history were abstracted from the medical record. Fifty adult (age  $\geq$ 18 years) postoperative cardiothoracic patients receiving insulin and vasopressor infusions were enrolled and consented to participate in the study. Because samples were needed early in the postoperative recovery process and patients were sedated and therefore incapable of giving consent, we obtained ethical review and approval for a conditional waiver

of consent and authorization. We collected the early matched samples, and these data were used only if the participant or legally authorized representative later gave consent for use of the samples.

Patients with a hematocrit of less than 20% or greater than 70% were excluded from the study because of reported inaccuracy of the glucometer (Abbott Precision PCx) in

such patients. All participants were required to have undergone coronary artery bypass grafting, valve repair or replacement, lung transplant, or heart transplant and were receiving insulin as a part of standard care for blood glucose management after cardiothoracic surgery. The first blood sample was obtained at the immediate postoperative admission as per standard postoperative care orders. Results of blood glucose checks from capillary and arterial sources were recorded. The type and number of intravenous vasopressor medications and intravenous insulin administered were also recorded. Additional assessment data included the presence of edema, quality of capillary refill, and quality of pulse in the arm from which the blood samples were obtained. The test nurse was not blinded to the results; however, bias was limited by the objective nature of the data and the assessment strategy. The majority of variables were objective data (blood glucose values and the number of vasopressor medications used) with the exception of the perfusion assessment. The possibility for introduction of bias in the perfusion assessment was limited by the fact that nurses used a standardized assessment scale and evaluated all patients in the same manner. There was no "treatment group" per se; all patients had exactly the same assessment. In addition, nurses documented the same information in each patient's record as was used for the research study.

Postoperative cardiothoracic adult patients receiving insulin and vasopressors were enrolled.





#### Analysis

A descriptive, quantitative evaluation of all demographic variables was conducted to estimate the frequency and distribution of patients' characteristics. Each patient had blood samples obtained simultaneously from arterial and capillary sites for the duration of the insulin infusion. This procedure resulted in all patients having 2 to 5 sets of blood samples. A total of 162 sets of blood glucose values were used in the analysis after missing values and outliers were removed. The "outliers" consisted of 3 samples with blood glucose values of 1002, 14, and 18 mg/dL. These values are inconsistent with the correlating capillary POCT value taken from these same patients at the same time points. We therefore consider these values to be errors, and we eliminated those samples from the analysis.

Clarke error grid analysis (EGA)<sup>13</sup> was performed to assess the level of agreement between both capillary and arterial blood glucose levels measured by using POCT and arterial blood glucose levels measured by using CCLT. The error grid analysis has 5 zones of relative accuracy of estimation of blood glucose level. Zone A indicates a difference of less than 20% in the blood glucose values being compared. This zone represents acceptably equivalent values, and no difference would be expected with regard to clinical decision making in response to values that fall in this zone. Zone A is the only acceptable zone that has the same criteria as the International Standardization Organization (ISO) 15197 gold standard guideline. Zone B represents a difference of greater than 20% in glucose values but has minimal impact on the clinical treatment. Zone C indicates that the difference in glucose values would lead to overcorrection or unnecessary treatment of the acceptable

blood glucose level and causes a change in the clinical action. Zone D indicates that the difference in glucose values has the risk of failure to detect or treat an error. Zone E indicates that the difference in glucose values causes erroneous treatment.

The ISO 15197 guideline states that measurements should be within 15 mg/dL of reference for glucose levels less than 75 mg/dL and within 20% for glucose levels of 75 mg/dL or higher. A blood glucose device is considered accurate if 95% of pairs satisfy these criteria. Results that fall outside the ISO 15197 tolerance bands are considered inaccurate.<sup>14</sup>

Analysis of variance was used to evaluate the association between the differences in sets of blood glucose values within each time point, peripheral perfusion, and vasopressor use. The patients were classified into 2 groups according to medication use at the time of the blood sampling: 1-2 medications and 3-5 medications. The patients' peripheral perfusion was classified as either cool or warm. The analyses were performed by using SAS statistical software version 9.2.

#### **Results**

Of 50 patients who agreed to participate in the study, 1 patient had incomplete data and could not be included in the final analysis. Among the 49 remaining participants, a total of 162 sets of blood glucose values were available for the final analysis. The mean age of participants was 61.3 years (SD, 13.9 years) and 82% (n = 40) were white. The mean body mass index (calculated as weight in kilograms divided by height in meters squared) for the sample was 28.8 (SD, 7.0), and 27% (n = 13) of the participants were smokers. The mean core body temperature was 37.2 °C (SD, 0.9 °C), and the mean number of vasopressin, norepinephrine, or phenylephrine) that patients were receiving was 3.2 (SD, 1.0).

First, the level of agreement between the capillary blood glucose level measured by using the POCT and the arterial blood glucose level measured by using CCLT was evaluated with respect to the Clarke EGA and ISO 15197 guideline. Only 88.3% of the capillary POCT values fell in zone A (Figure 1), and 88.3% were within the ISO 15197 tolerance bands. The capillary blood glucose level measured by using POCT was therefore considered inaccurate, as less than 95% of the values satisfy the criteria of the ISO clinical standards guideline. A systematic bias between the POCT and CCLT results was present, as was expected on the basis of previously reported research.

Next, Clarke EGA was used to evaluate the level of agreement in the arterial blood glucose levels

measured by using POCT and the arterial blood glucose levels measured by using CCLT. Acceptable agreement between arterial blood glucose levels measured by POCT and those measured by CCLT was indicated, with 94.4% of values falling in zone A (Figure 2). The comparison performed by ISO 15197 guideline had the same results: 94.4% of the pairs of arterial blood glucose levels measured by using POCT and arterial blood glucose levels measured by using CCLT were within the tolerance bands.

Finally, analysis of variance was used to examine the relationship among use of vasopressor medications, peripheral perfusion scores, and the accuracy and reliability of blood glucose values obtained via arterial POCT. Patients receiving more vasopressors (>2 concomitant vasopressor medications) demonstrated a significant difference in the accuracy of arterial blood glucose measurements obtained via POCT as compared with patients receiving fewer vasopressors (0-2 vasopressor medications; F = 15.01; P = .001). Figure 3 shows Clarke EGA with 90% of arterial POCT values falling in zone A in patients receiving more than 2 vasopressor medications. The accuracy of blood glucose levels obtained via arterial POCT is not significantly different in patients with decreased peripheral perfusion, categorized as cool, and patients with better perfusion, categorized as warm (F = 0.0; P = .98).

In summary, blood glucose levels measured via arterial POCT are significantly less accurate in patients who are being treated with more vasopressors (see Table).

#### Discussion

In this study, we evaluated the accuracy of POCT blood glucose measurements of both capillary and arterial blood samples from patients receiving insulin after cardiothoracic surgery. Accuracy was determined by the level of agreement between blood glucose measurements obtained from capillary as well as arterial samples tested by using POCT in comparison with the gold standard measure, CCLT of an arterial sample. Two statistical approaches were used to verify level of agreement, the Clarke error grid analysis and the ISO 15197, the standard analysis used in the clinical chemistry laboratory, upon which guidelines for clinical acceptability in levels of agreement are based.

In addition and most importantly, we evaluated the relationship between both use of vasopressor medications and altered peripheral perfusion and the accuracy of blood glucose values measured via arterial POCT in patients receiving insulin after cardiothoracic surgery. Results showed that patients receiving more than 2 vasopressor infusions had significantly less



**Figure 2** Accuracy of arterial point-of-care testing versus clinical chemistry laboratory testing for measurement of blood glucose levels (N = 126).



point-of-care testing versus clinical chemistry laboratory testing in patients receiving 3-5 vasopressive medications (N = 30; F = 15.01; P < .001).

accurate arterial blood glucose values than did patients receiving less than 2 vasopressors. Peripheral perfusion did not affect the accuracy of arterial POCT blood glucose values.

These findings play an important role in intensive care, particularly for patients undergoing cardiothoracic surgery. The importance of glycemic control for all patients undergoing cardiac surgery has been demonstrated in numerous studies.<sup>1,2,15</sup> Having higher glucose levels (>180 mg/dL) during the perioperative

#### Table

Error grid analysis of accuracy of arterial point of care versus clinical chemistry laboratory testing by vasopressor medication use (N = 162)

	No. (%) of blood glucose values					
Zone	0-2 Medications	3-5 Medications				
A	126 (95.5)	27 (90.0)				
В	6 (4.5)	3 (10.0)				
С	0 (0.0)	0 (0.0)				
D	0 (0.0)	0 (0.0)				
E	0 (0.0)	0 (0.0)				

period is an independent predictor of mortality in diabetic and nondiabetic patients.<sup>3</sup> Although glycemic control in critically ill patients decreases infection and mortality, tight glycemic control (<150 mg/dL) is associated with increased incidence of hypoglycemic events and increased mortality.<sup>16</sup> These results led to the early discontinuation of research protocols for tight glycemic control.<sup>16-18</sup> Glycemic control (glucose <180 mg/dL) is a class I recommendation in the 2011 ACCF/AHA guidelines.<sup>3</sup> Despite this recommendation, the evidence for titration of insulin infusions following cardiothoracic surgery in patients who are subsequently receiving high doses of vasopressor medications is scant.

In populations of critically ill patients, altered blood pressure affects the accuracy of POCT blood glucose measurements.<sup>5-7,10</sup> These studies have shown that POCT blood glucose measurements are accurate in normotensive patients and correlate well with measurements of arterial samples. However, after cardiothoracic surgery, patients are likely to be hypotensive and typically receive more than 2 vasopressor medications for short-term hemodynamic support. These patients may be normotensive by arterial blood

Patients receiving more than 2 vasopressors had less accurate blood glucose values. pressure measurement, but because of the  $\alpha$ - and  $\beta$ -adrenergic receptor agonist effects of the medication, may have resultant peripheral vasoconstriction. Our study supports the hypothesis that a relationship does exist between the accuracy of POCT blood glucose measurements and use of vasopressor medications. Although other studies addressing

this specific relationship have not been reported, our study results suggest that administration of more than 2 vasopressor medications affects the accuracy of POCT blood glucose measurements in postoperative cardiothoracic surgery patients.

We evaluated the relationship between peripheral perfusion in postoperative cardiac surgery patients and the accuracy of POCT blood glucose analysis and found no significant difference in accuracy of blood glucose measurements in patients with decreased perfusion.

#### Limitations

A limitation of the study was the short stay in the intensive care unit for patients after cardiothoracic surgery in this study. We were likely to lose data capture opportunities for data collection after the first 4 to 8 hours, owing to the rapid discontinuation of vasopressor drugs. Because all patients did not have data beyond the second time period, we were not able to conduct a multiple repeated-measures analysis and therefore lacked the ability to have increased sensitivity in the statistical output beyond the second data collection point for each patient. For example, we could not evaluate the trends in warming and decreasing drug use on blood glucose values over time by using repeated-measures analysis because all patients did not have more than 2 time points of evaluation. In addition, patients were warmer than anticipated (higher core body temperature) in the immediate postoperative period, which may have minimized the effect of peripheral vasoconstriction. Last, the care nurse served as the investigator as well as the care nurse; therefore, patients with high doses of multiple inotropic agents may have required care that precluded regularly scheduled data collection.

#### Implications for Clinical Practice \_

Clinical practice recommendations based on these findings included the following:

• POCT using arterial blood samples was recommended to improve the efficiency and reduce the cost of obtaining frequent blood glucose measurements.

• POCT was only within acceptable limits of accuracy in patients receiving no more than 2 concomitant vasopressors.

• Use of a consistent blood source for testing was recommended to reduce unnecessary variation and improve safety in insulin dosing.

This study validated previous work showing a systematic bias in the use of capillary POCT as opposed to CCLT for management of patients' insulin infusions. In addition, the arterial POCT results were within the 95% acceptable level of agreement with CCLT results. Those patients receiving 3 or more vasopressor medications had significant and unacceptable differences in blood glucose values as compared with CCLT results. Therefore the POCT device cannot be recommended for patients receiving 3 or more vasopressors.

Our research work group was interested in conducting this study because nurses had observed situations when simultaneous testing in patients produced large variances in results. These differences were confirmed in the initial analysis of the accuracy of capillary blood glucose values. Because of the overall inaccuracy of capillary values, it was irrelevant to analyze further the effect of vasoconstrictors or peripheral perfusion. The recommendation to the clinical practice council supported the use of POCT with arterial blood to improve accuracy at the highest rate of precision and avoiding using capillary samples in these patients. In addition, our study shows that blood glucose measurements obtained via arterial POCT in patients receiving more than 2 vasopressors are not reliable in cardiac surgery patients. Study results were disseminated at a patient safety conference for our entire health system, and the study team received a first place award for research to improve patient safety.

Current practice includes use of POCT testing with arterial blood samples for titration of insulin infusions in cardiac surgery patients. Our study results demonstrate inaccuracy in these values in patients receiving more than 2 vasopressors. These results must be verified in a larger sample of patients before we can recommend practice change. A quality improvement project to verify these results is planned.

#### Conclusions \_

Our findings show that capillary POCT resulted in unacceptable, low levels of agreement with the gold standard CCLT. Arterial POCT blood glucose measurements were within the 95% acceptable level of agreement with CCLT measurements, and arterial POCT is recommended for safe titration of insulin infusions in postoperative cardiothoracic patients. In patients receiving 3 or more vasopressor infusions, arterial POCT yielded significantly different results from CCLT and cannot be recommended for safe titration of insulin. Last, arterial POCT blood glucose measurements were not significantly different from CCLT measurements in patients with poor peripheral perfusion (cold) as compared with patients with normal peripheral perfusion (warm).

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## CNE Test ID A132253: Suitability of Capillary Blood Glucose Analysis in Patients Receiving Vasopressors

*Learning objectives*: 1. Identify the factors that can affect the accuracy of blood sugar testing. 2. Discuss what blood glucose testing method is acceptable for patients with less than 2, or more than 2 vasopressors. 3. Describe the potential consequences of using an inaccurate blood glucose testing method.

1. Which of the following is a basefit of hlood glucose (RG) <ul> <li>measurement by waiting the finge statis method?         <ul> <li>a. Bit and weighted shifts to mark method?</li> <li>b. Bit and weighted shifts to mark method?</li> <li>b. Bit and weighted shifts to mark method?</li> <li>c. All of the following is not a current furthing to the study?</li> <li>a. Which of the following is not a current furthing to the study what is the relationship between peripheral accessed peripheral accessed peripheral former is patients with increased peripheral.</li> <li>b. Arterial POCT can be used on portoperative curling waters with a current of the study?</li> <li>b. Arterial POCT can be used on portoperative studies with meressed peripheral.</li> <li>b. Arterial POCT can be used on portoperative studies with meressed periphism.</li> <li>b. Comparison of the following is not a quality used to accessed periphism.</li> <li>b. There is a significant difference in patients with increased periphism.</li> <li>b. There is a significant difference in patients with meressed periphism.</li> <li>c. Capillary POCT can be used on portoperative curling increased periphism.</li> <li>b. There is a significant difference in patients with meressed periphism.</li> <li>b. Arterial POCT is not a major limitation of the study?</li> <li>b. Arterial POCT is not a major limitation of the study?</li> </ul> </li> <li>b. Arterial POCT is not a significant difference in patients with meressed periphism.</li> <li>c. Capillary POCT and the following is not a quality used to accessed periphism.</li> <li>c. Amaly periphical periphical periphical measures malysis</li> <li>d. There is a significant difference in patients with docestenemisting paterimismes with accessed periphism.</li></ul>	-					-				-	-			
2. Which of the following is not a carrent nursing practic?         According to the study what is the relationship between peripheral perfusion in postoperative cardiae surgery patients and accuracy of POCT?           3. Which of the following is not a carrent nursing practic?         The study what is the relationship between peripheral perfusion in postoperative cardiae surgery patients and accuracy of POCT?           3. Which of the following is not a carrent nursing PDCT?         There is a significant difference in patients with decreased perfusion.           4. Oxnors check BG via financia.         There is a significant difference in patients with decreased perfusion.           5. Arterial POCT         Capality yeard to assess peripheral fits than 20%.           6. Alterial CUT         Shich of the following is not a quality used to assess peripheral fits above?           7. Which of the following is not a capality used to assess peripheral fits above?         Capality of the above?           8. Alterial POCT and peripheral perfusion.         Capality Procting Cut	<ol> <li>Which of the following is a benefit of blood glucose (BG) measurement by using the finger-stick method?</li> <li>a. It is accurate in normotensive patients</li> <li>b. It can be delegated safely to nursing care assistant</li> <li>c. All of the above</li> </ol>						<b>8. Which</b> a. Capillar b. Arterial c. Capillar d. Arterial	<ul> <li>8. Which of the following is not a recommendation of the study?</li> <li>a. Capillary POCT should not be used on postoperative cardiothoracic patients.</li> <li>b. Arterial POCT can be used on patients with less than 3 vasopressors.</li> <li>c. Capillary POCT can be used on normotensive patients.</li> <li>d. Arterial POCT can be used on postoperative patients with more than 3</li> </ul>						
2. Which of the following: not a current nursing practice?       9. According to the study what is the relationship between peripherant perivation in proteom	d. None of	the above					vasopre	ssors.						
d. Nurse of the K BA Via clinical themstry laboratory testing (CUL1)       b. There is a significant difference in patients with increased perfusion.         3. Which of the following is the gold standard of BG testing?       c. There is a significant difference in patients with increased perfusion.         4. Atterial POCT       c. Capillary portion in the study?         4. Mich of the following is not a quality used to assess peripheral tissue perfusion in the study?       a. Short study of alients in interave care unit b. Ray of alients with increased perfusion.         5. Which of the following patients were excluded from the study?       a. Short study of alients with accession and the study?         6. Mich of the following patients were excluded from the study?       b. Check BG via arterial cCUT.         6. All of the above       d. There is a significant difference in patients with odd externities.         6. According to Clarke Ferror Grid Analysis, which of the following to and peripheral perfusion?       a. Check BG via arterial POCT is more accurate in patients with odd externities.         b. Zome A       c. Zome C       C. Zome C         7. Which of the following methods of checking blood glucose have an acceptable level of algorement the prefusion?       c. Analyze peripheral perfusion?         6. According to Clarke Ferror Grid Analysis, which of the following acceptable level of algorement the study?       c. Arterial POCT is more accurate in patients with horm extermilities.         7. Which of the following methods of checking blood glucose have an acceptable level of algore	<ul> <li>2. Which of the following is not a current nursing practice?</li> <li>a. Hourly BG monitoring of patients with insulin infusion</li> <li>b. Nurses check BG via finger stick</li> <li>c. Nurses check BG using arterial sample</li> </ul>						<ul> <li>9. According to the study, what is the relationship between peripheral perfusion in postoperative cardiac surgery patients and accuracy of POCT?</li> <li>a. There is no significant difference in patients with decreased perfusion.</li> </ul>							
5. Which of the following is not a quality used to assess peripheral       1. Here is a sgminand interease in plantation of the study?         4. Which of the following is not a quality used to assess peripheral       1. Bapid discontinuation of vasopressors c. Ability to conduct multiple repeated measures analysis         4. Which of the following is not a quality used to assess peripheral       1. Devised as a sgminand interease of the study?         5. Which of the following patients were excluded from the study?       2. Ability to conduct multiple repeated measures analysis         6. According to Clarke Error Grid Analysis, which of the following and arterial bod glucose takes and arterial bod glucose takes and arterial bod glucose takes an acceptable level of agreement between capital study and atterial bod glucose takes an acceptable level of agreement in patients with 3 or fewer vasopressors?         7. Which of the following methods of checking blood glucose takes an acceptable level of agreement in patients with 3 or fewer vasopressors?         7. Application and critel POCT         8. Capillary POCT and arterial POCT and actrial POCT actr	d. Nurses check BG via clinical chemistry laboratory testing (CCLT)						b. There is c. There is	<ul><li>c. There is no significant difference in patients with increased perfusion.</li><li>c. There is a significant difference in patients with increased perfusion.</li></ul>						
b. Arterial fOCT       10. Which of the following is not a quality used to assess peripheral fissue perfusion in the study?       a. Short sky of patients in there study?         4. Which of the following is not a quality used to assess peripheral fissue perfusion in the study?       a. Short sky of patients in there study?         4. Which of the following patients were excluded from the stud?       a. Short sky of patients in there study?         5. Which of the following patients were excluded from the stud?       a. Check BG by CCLT.         6. According to Clarke Error Grid Analysis, which of the following to a direct patient swith hematoric less than 20%.       c. Check BG via capillary POCT.         6. According to Clarke Error Grid Analysis, which of the following to an accurate in patients with warm extremities.       a. Arterial POCT is more accurate in patients with a ord extrements in aptient with cold extremities as compared with hose with warm extremities.         7. Which of the following methods of checking blood glucose hare an acceptable level of agreement in patients with 3 or ferver vasopressors?       a. Arterial POCT is more accurate in patients with cold extremities.         7. Check BG via capillary POCT and critical POCT       b. D b       b. D b         7. Capillary POCT and peripheral perfusion       c. Capillary POCT and critical POCT       c. There is no significant difference in accuracy of BG measurements in patient with cold extremities as compared with hows with warm extremities.         7. Capillary POCT and critical POCT       b. D b       b       b         6	a. Capillary	of the follow: y point-of-care	<b>ing is the</b> testing (I	<b>gold standard</b> POCT)	1 of BG test	ing?	d. There is	s a significant	difference i	n patients with	decreased per	tusion.		
<ul> <li>C. Gapillary CCIT</li> <li>A. Arterial CCLT</li> <li>a. Alterial Scontinuation of vasopressors.</li> <li>c. Capillary refil</li> <li>b. Puake</li> <li>d. Temperature</li> <li>a. Call of the above</li> <li>J. The patients were excluded from the study?</li> <li>b. Patients with hematocrit less hand 20%</li> <li>b. Patients with hematocrit greater than 20%</li> <li>c. Capillary POCT.</li> <li>d. Anorei of the above</li> <li>d. None of the above</li> <li>d. None of the above</li> <li>d. Sone of the above</li> <li>d. Sone of the above</li> <li>d. Sone of the above</li> <li>d. Zone A</li> <li>d. Zone A</li> <li>d. Zone A</li> <li>d. Zone D</li> <li>d. Sone of che above</li> <li>d. Zone A</li> <li>d. Zone B</li> <li>d. Zone A</li> <li< td=""><td>b. Arterial</td><td>POCT</td><td>(i</td><td>001)</td><td></td><td></td><td>10. Whic</td><td>h of the follo</td><td>owing is no</td><td>t a major limi</td><td>tation of the</td><td>study?</td></li<></ul>	b. Arterial	POCT	(i	001)			10. Whic	h of the follo	owing is no	t a major limi	tation of the	study?		
<ul> <li>d. Arterial CCLT</li> <li>b. Rapid discontinuation of vasopressors</li> <li>c. Ability to conduct multiple repeated measures analysis</li> <li>d. Patients with of the following patients were excluded from the study?</li> <li>a. Edema c. Capillary refull</li> <li>b. Pales with hematocrit less than 20%</li> <li>c. Ability to conduct multiple repeated measures analysis</li> <li>d. Patients with hematocrit less than 20%</li> <li>c. Ability to conduct multiple repeated measures analysis</li> <li>d. Patients with hematocrit less than 20%</li> <li>c. All of the above</li> <li>d. None of the above</li> <li>d. According to the study, what is the relationship between arterial PCT is more accurate in patients with odd extremities.</li> <li>b. Acterial PCCT is more accurate in patients with odd extremities.</li> <li>b. Acterial PCCT and criterial Port is more accurate of Borne expires: September 1. 2005. Test Answers: Mark only one box for your answer to each question.</li> <li>c. Capillary PCCT and criterial Perfusion.</li> <li>c. Capillary PCCT and perfusion.</li> <li>c. Capilla</li></ul>	c. Capillary	V CCLT					a. Short st	ay of patients	s in intensive	e care unit		•		
<ul> <li>4. Which of the following is not a quality used to assess peripheral tissue perfusion in the study?</li> <li>a. Edema</li> <li>b. Pailes</li> <li>d. Temperature</li> <li>c. Capillary PCH</li> <li>a. Anne of the above</li> <li>d. None of the above</li> <li>d. Anne of the above</li> <li>d. There is a significant difference in accuracy of BG measurements in patient with cold externities.</li> <li>d. The above is a significant difference in accuracy of BG measurements in pati</li></ul>	d. Arterial	CCLT					b. Rapid discontinuation of vasopressors							
<ul> <li>a. Johnson of the study and the study between a sterial CCLT.</li> <li>b. Alson of the above</li> <li>c. All of the above</li> <li>c. According to Clarke Error Grid Analysis, which of the following and arterial body glucose using POCT or CCLT?</li> <li>a. Zone A c. Zone C b. Zone C d. Zone D</li> <li>7. Which of the following and the study and arterial body glucose study in patients with soft externities.</li> <li>b. Arterial POCT and and retrial pOCT is more accurate in patients with cold extremities.</li> <li>c. All of the following and the study and the study of the study.</li> <li>a. Zone A c. Zone C b. Zone D</li> <li>c. Check BG via arterial CCT is more accurate in patients with and extremities.</li> <li>b. Arterial POCT and arterial POCT is more accurate in accuracy of BG measurements in a patient with cold extremities as compared with those with warm extremities.</li> <li>c. There is a significant difference in accuracy of BG measurements in a patient with cold extremities as compared with those with warm extremities.</li> <li>c. There is a significant difference in accuracy of BG measurements in a patient with cold extremities as compared with those with warm extremities.</li> <li>c. There is a significant difference in accuracy of BG measurements in a patient with cold extremities as compared with those with warm extremities.</li> <li>d. There is a ganglicant power as a ganglicant power and externities.</li> <li>d. There is a ganglicant power as a ganglicant po</li></ul>	4 Which	of the follow	ing is not	a quality use	d to assess i	nerinheral	c. Ability i	c. Ability to conduct multiple repeated measures analysis						
a. Ed <sup>m</sup> a b. Pulse d. Temperature a. Alterina Volt S. Which of the following patients were excluded from the study? a. Patients with hematocrit is subma 20% b. Patients with hematocrit is subma 20% b. Patients with hematocrit is subma 20% c. All of the above d. None of the above d. Zone A c. Zone C of de calculation d. Cone C of de	tissue per	fusion in the	e study?	a quanty used	u to assess j	peripheral	u. i attenta	s were warme		ipateu				
b. Pulse       d. Temperature       study recommend?         5. Which of the following patients were excluded from the study?       b. Patients with hematorities than 20%.       c. Check BG via carpitalay POCT.         6. According to Clarke Error Grid Analysis, which of the following zones indicates the highest level of agreement between expillary and arterial blood glucose away in gPOCT or CCLT?       c. Analyze peripheral perfusion.         7. Which of the following methods of checking blood glucose have an acceptable level of agreement in patients with 3 or fewer vasopressors?       a. Come A       c. Zome C         8. Copillary POCT and crefine perfusion       c. Capillary POCT and peripheral perfusion       c. Capillary POCT and peripheral perfusion         1. \_a       2. \_a       3. a       4. \_a       5. a       6. a       7. \_a       8. \_a       9. a       10. \_a       11. \_a       12. \_a         1. \_a       2. a       3. a       4. \_a       5. a       6. a       7. \_a       8. \_a       9. a       10. \_a       11. \_a       12. \_a         1. \_a       2. a       3. a       4. \_a       5. a       6. a       7. \_a       8. \_a       9. a       10. \_a       11. \_a       12. \_a         1. \_a       2. a       3. a       4. \_a       5. a       6. a       7. \_a       8. \_a       9. a       10. \_a	a. Edema	c. (	Capillary 1	refill			<b>11</b> . In pat	tients receiv	ing more th	nan 2 vasopres	ssors, what d	oes the		
<ul> <li>a. Check BG is arterial CCLT.</li> <li>b. Patients with hematorit less than 20%</li> <li>b. Patients with hematorit less than 20%</li> <li>c. All of the above</li> <li>d. None of the above</li> <li>d. None of the above</li> <li>d. According to Clarke Error Grid Analysis, which of the following zones indicates the highest level of agreement between capillary and arterial POCT is more accurate in patients with odd extremities.</li> <li>a. Zone A</li> <li>c. Zone B</li> <li>d. Zone B</li> <li>d. Zone C</li> <li>c. Cane G</li> <li>d. All of the following methods of checking blood glucose have an acceptable level of agreement in patients with 30 or flewer vasopressors?</li> <li>a. Capillary POCT and peripheral perfusion</li> <li>c. Capillary POCT and peripheral perfusion</li> <li>c. Capillary POCT and peripheral perfusion</li> <li>c. Capillary POCT and CCLT</li> <li>d. Aterial POCT is more accurate in patients with and the set with warm extremities.</li> <li>d. There is a significant difference in accuracy of BG measurements in patient with cold extremities.</li> <li>d. There is a significant difference in accuracy of BG measurements in patient with cold extremities.</li> <li>d. There is a significant difference in accuracy of BG measurements in patient with cold extremities.</li> <li>d. There is a significant difference in accuracy of BG measurements.</li> <li>d. There is a significant difference in accuracy of BG measurements in patients with and extermities.</li> <li>d. There is a significant difference in accuracy of BG measurements.</li> <li>d. There is a significant difference in accuracy of BG measurements.</li> <li>d. There is a significant difference in accuracy of BG measurements.</li> <li>d. Capillary POCT and CCLT</li> <li>d. Aternal POCT is contect in accuracy of BG measurements.</li> <li></li></ul>	b. Pulse	d.	Temperate	ure			study rec	study recommend?						
<ul> <li>a. Write of the boliowing patients were excluded from the study?</li> <li>b. Patients with hematoric greater than 70%.</li> <li>c. All of the above</li> <li>d. None of the above</li> <li>d. None of the above</li> <li>d. Anone of the above</li> <li>d. According to Clarke Error Grid Analysis, which of the following zones indicates the highest level of agreement between capillary POCT is more accurate in patients with cold extremities.</li> <li>a. Zone A c. Zone C</li> <li>d. Zone B d. Zone D</li> <li>c. Capillary POCT and acterial DOCT</li> <li>b. Capillary POCT and peripheral perfusion?</li> <li>a. Capillary POCT and peripheral POCT</li> <li>b. Capillary POCT and CCLIT</li> <li>c. Capillary POCT and CCLIT</li> <li>c. Capillary POCT and CCLIT</li> <li>d. Arterial POCT</li> <li>b. Capillary POCT and CCLIT</li> <li>c. Capillary POCT and CCLIT</li> <li>Test ID: Al32253 Contact hours: L0: pharma 0.0 Form expires: September 1. 2016. Test Answers: Mark only one box for your answer to each question.</li> <li>1. a 2. a 3. a 4. b 5. b 6. b b b b b b b b b b b b b b b b b</li></ul>	■ XA71.1.1.	. C 41 C 11			1 . 1 6	1	a. Check E	a. Check BG by CCLT.						
<ul> <li>b. Patients with hematocrit greater than 70%</li> <li>c. All of the above</li> <li>d. None of the above</li> <li>d. None of the above</li> <li>d. According to Clarke Error Grid Analysis, which of the following and arterial Blood glucose using POCT or CCLT?</li> <li>a. Zone A</li> <li>d. Zone B</li> <li>d. Zone C</li> <li>a. Capillary POCT and Cutt</li> <li>Test ID: All22S3 Contact hours: 10; pharma 0.0 Form expires: September 1, 2016. Test Answers: Mark only one box for your answer to each question.</li> <li>1. Da</li> <li>c. Capillary POCT and Cutt</li> <li>Test ID: All22S3 Contact hours: 10; pharma 0.0 Form expires: September 1, 2016. Test Answers: Mark only one box for your answer to each question.</li> <li>1. Da</li> <li>2. Da</li> <li>3. Da</li> <li>4. Da</li> <li>b</li> <li>b</li> <li>b</li> <li>c</li> <li>c</li> <li>c</li> <li>c</li> <li>d</li> <li>d<td>a Patients</td><td>with hematoc</td><td>rit less the</td><td>an 20%</td><td>lea from th</td><td>le study?</td><td>D. Check P</td><td colspan="6">D. Check BG via arterial CCL1.</td></li></ul>	a Patients	with hematoc	rit less the	an 20%	lea from th	le study?	D. Check P	D. Check BG via arterial CCL1.						
c. All of the above d. None of the above 6. According to Clarke Error Grid Analysis, which of the following methods of clarke is particular to an accurate in patients with cold extremities. a. A tretrial POCT is more accurate in patients with warm extremities. b. Zone B d. Zone A c. Zone C b. Zone B d. Zone A d. Zone A c. Zone C b. Zone B d. Zone A d. Zone A d. Zone A d. Zone B d. Zone A d. Zone B d. Zone C b. Capillary POCT and arterial POCT c. Capillary POCT and cretaril POCT d. Arterial POCT and cretaril POCT d. Arterial POCT and cretaril POCT and CCLT Test ID: Al32253 Contact hours: 1.0; pharma 0.0 Form expires: September 1, 2016. Test Answers: Mark only one box for your answer to each question. 1.1 a 2. a 3. a 4. a b<	b. Patients	with hematoc	rit greater	than 70%			d. Analyze	d. Analyze peripheral perfusion.						
d. None of the above       12. According to the study, what is the relationship between arterial poor is not accuracy of phoral perfusion?         6. According to Clarke Error Grid Analysis, which of the following zones indicates the highest level of agreement between capillary and arterial blood glucose using POCT or CCLI?       a. Arterial POCT is more accurate in patients with varm extremities.         b. Zone A       c. Zone C       b. Arterial POCT add cripheral perfusion?         c. Capillary POCT and peripheral perfusion       c. Capillary POCT and criptane perfusion       c. Capillary POCT and criptane perfusion?         c. Capillary POCT and peripheral perfusion       c. Capillary POCT and peripheral perfusion?       c. Capillary POCT and peripheral perfusion?         c. Capillary POCT and peripheral perfusion       c. Capillary POCT and peripheral perfusion?       c. Capillary POCT and peripheral perfusion?         c. Capillary POCT and peripheral perfusion?       c. Capillary POCT and peripheral perfusion?       c. Capillary POCT and peripheral perfusion?         c. Capillary POCT and peripheral perfusion?       c. Capillary POCT and peripheral perfusion?       c. Capillary POCT and Peripheral perfusion?         d. Arterial POCT and peripheral perfusion?       c. Capillary POCT and peripheral perfusion?       c. Capillary POCT and peripheral perfusion?         d. Capillary POCT and peripheral perfusion?       c. Capillary POCT and Peripheral perfusion?       c. Capillary POCT and Peripheral perfusion?         d. Capillary POCT and peripheral perfusion? <td>c. All of the</td> <td>e above</td> <td>e</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>	c. All of the	e above	e											
6. According to Clarke Error Grid Analysis, which of the following anot indicates the highest level of agreement between capillary and arterial blood glucose using POCT or CCLT? a. Zone A c. Zone C b. Zone B d. Zone D 7. Which of the following methods of checking blood glucose have an acceptable level of agreement in patients with 3 or fewer vasopressors? a. Capillary POCT and CCLT 7. Which of the following methods of checking blood glucose have an acceptable level of agreement in patients with 3 or fewer vasopressors? a. Capillary POCT and peripheral perfusion c. Capillary POCT and CCLT Test ID: A132253 Contact hours: 10: pharma 0.0 Form expires: September 1, 2016. Test Answers: Mark only one box for your answer to each question. 1. 1. 1.a. 2. 1.a. 3. 1.a. 4. 1.a. 5. 1.a. 6. 1.a. 7. 1.a. 8. 1.a. 9. 1.a. 10. 1.a. 12. 1.a. 1.a. 12. 1.a. 1.b. 1.b. b.	d. None of	the above					12. Accor	ding to the	study, what	is the relation	nship betwee	n arterial		
and arterial blood glucose using POCT or CCLT? a. Zone A c. Zone C b. Arterial POCT is more accurate in patients with varm extremities. b. Arterial POCT is more accurate in patients with varm extremities. c. Zone B d. Zone D c. Zone C b. Arterial POCT is more accurate in patients with varm extremities. c. There is no significant difference in accuracy of BG measurements in patients with vare extremities. c. Control and ercipheral perfusion c. Capillary POCT and dreintal POCT b. Capillary POCT and dreintal POCT b. Capillary POCT and dreintal POCT c. Capillary POCT and dreintal POCT b. Capillary POCT and dreintal POCT c. Capillary POCT and CCLT d. Arterial POCT and CCLT Test ID: A132253 Contact hours: 10; pharma 0.0 Form expires: September 1, 2016. Test Answers: Mark only one box for your answer to each question. 1. <b>a</b> 2. <b>a</b> 3. <b>a</b> 4. <b>a</b> 5. <b>a</b> 6. <b>a</b> 7. <b>a</b> 8. <b>a</b> 9. <b>a</b> 10. <b>a</b> 11. <b>b</b> 12. <b>b b b b b b b b b b</b>	6 Accordi	ing to Clarke	Frror Gr	id Analysis w	hich of the	following	POCT BG	POCT is mo	ents and per	ripheral perfu	usion? cold extremiti			
and arterial blood glucose using POCT or CCLT?       a. Zone A       c. Zone C         a. Zone A       c. Zone C         b. Zone B       d. Zone D         7. Which of the following methods of checking blood glucose have an acceptable level of agreement in patients with 3 or fewer vasopressors?       a. Capillary POCT and retrial POCT         b. Capillary POCT and certification of the following methods of checking blood glucose have an acceptable level of agreement in patients with 3 or fewer vasopressors?       a. Capillary POCT and certification of certifica	zones indi	icates the high	phest leve	l of agreement	between c	apillarv	b. Arterial	POCT is mo	re accurate i	n patients with	warm extrem	ities.		
a. Zone A c. Zone C d. Zone D patients with cold extremities as compared with those with warm extremities as compared with those with and extermities as compared with those with warm extremities as compared with those with warm extremities as compared with those with warm extremites as that as compared with those with warm extremites as the as compared with those with warm extremites as compared with those with warm extremites as a compared with those with and extermites as the as the as those the perfusion excent as provide of commany express september 1, 2016. Test Answers: Mark only one box for y	and arteri	ial blood glu	, cose usin	g POCT or CC	LT?	1 7	c. There is	no significar	nt difference	in accuracy of	BG measurem	ents in		
b. Zone B       d. Zone D       d. I here is a significant difference in accuracy of BC measurements in patients with sof exercise as compared with those with warm extremities.         7. Which of the following methods of checking blood glucose have an acceptable level of agreement in patients with 3 or fewer vasopressors?       a. Capillary POCT and peripheral perfusion         c. Capillary POCT and peripheral perfusion       c. Capillary POCT and peripheral perfusion       c. Capillary POCT and CCLT         Test ID: A132253 Contact hours: 1.0; pharma 0.0 Form expires: September 1, 2016. Test Answers: Mark only one box for your answer to each question.       1. La 2. a 3. a 4. a 5. a 6. a 7. a 8. a 9. a 10. a 11. a 12. a b b b b b b b b b b b b b b b b b b	a. Zone A	c. 1	Zone C				patients	with cold ext	remities as c	ompared with t	hose with warr	n extremities.		
7. Which of the following methods of checking blood glucose have an acceptable level of agreement in patients with 3 or fewer vasopressors?       a. Capillary POCT and arterial POCT         b. Capillary POCT and cCLT       d. Arterial POCT and CCLT         Test ID: A132253 Contact hours: 1.0; pharma 0.0 Form expires: September 1, 2016. Test Answers: Mark only one box for your answer to each question.         1a       2a       3a       4a       5a       6a       7a       8a       9a       10a       11a       12a         1a       2a       3a       4a       5a       6a       7a       8a       9a       10a       11a       12a         1a       2a       3a       4a       5a       6a       7a       8a       9a       10a       11a       12a         1a       2a       3a       4a       5a       6a       7a       8a       9a       10a       11a       12a         1a       2a       3a       4a       5a       6a       7a       8a       9a       10a       11a       12a         1a       2a       3a       4a       5a       0a       10a	b. Zone B	d.	Zone D				d. There is	s a significant	difference ir	1 accuracy of BO	ith warm ovtr	its in patients		
Test ID: A132253 Contact hours: 1.0; pharma 0.0 Form expires: September 1, 2016. Test Answers: Mark only one box for your answer to each question.         1. a       2. a       3. a       4. a       5. a       6. a       7. a       8. a       9. a       10. a       11. a       12. a         b	7. Which o acceptable a. Capillary b. Capillary c. Capillary d. Arterial	<b>of the following</b> <b>e level of agre</b> by POCT and and by POCT and C POCT and C POCT and C	<b>ng metho ement in</b> rterial PO eripheral CLT CLT	<b>ds of checking patients with 3</b> CT perfusion	blood gluco or fewer va	ose have an sopressors	?							
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Fee: AACN members, \$0; nonmembers, \$10 Passing score: 9 correct (75%) Category: CERP A Test writer: Myra Torres, RN-BC, MSN, PCCN         AMERICAN ASSOCIATION of CRITICAL-CARE NURSES       Program evaluation (0) ective 1 was met )       Name	⊔d	⊔d	⊔d	⊔d	⊔d	⊔d	⊔d	⊔d	⊔d	⊔d	⊔d	⊔d		
AMERICAN ASSOCIATION OCRITICAL-CARE NURSES       Program evaluation Yes       Name         Objective 1 was met       Address         Objective 2 was met       City         Objective 3 was met       City         Objective 3 was met       Content was relevant to my nursing practice       City         Nume       AACN Customer ID#         Content was relevant to my nursing practice       Phone         Name       Country         AACN, 101 Columbia, Aliso Viejo, CA 92656.       medium         The American Association of Critical-Care Nurses is accredited as a provider of continuing nursing by the State Boards of Nursing of Alabama (#ABNP062), California (#01036), and Louisiana (#ABN12).	Fee: AACN r	nembers, \$0; r	onmembe	rs, \$10 Passing	score: 9 corre	ct (75%) Cat	egory: CERP A T	Test writer: My	<b>/ra</b> Torres, RN	I-BC, MSN, PCCN				
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Ø CRITICAL-CARE NURSES       Objective 1 was met       Image: Construction of construction of completion of completion of completion of completion, access to your test results, and certificate for passing scores.         For faster processing, take this CNE test online at www.ajcconline.org ("CNE Articles in This Issue") or mail this entire page to: AACN, 101 Columbia, Aliso Viejo, CA 92656.       Objective 1 was met       Image: Construction of completion of completion of completion, access to your test results, and certificate for passing scores.         The American Association of Critical-Care Nurses is accredited as a provider of continuing education in nursing by the State Boards of Nursing of Alabama (#ABNP0062), California (#01036), and Louisiana (#ABN12).       City	A	ASSOCIAT	ION			Yes No	Address							
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