

**Title:**

Impact of Overnight In-House Critical Care Resource Intensivist on Multidisciplinary Resident Education in the ICU Setting

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**Background:**

Critical care is a core component of both inpatient care and resident education in multiple specialties. At this institution, resident supervision was previously provided by an in-house acute care surgeon who also maintained other clinical responsibilities. In effort to provide enhanced attending-level resources and supervision specifically to overnight ICU residents, the critical care resource intensivist (CCRI) program was incorporated, wherein a dedicated ICU attending is present overnight. A previous study was performed to determine the perceptions of general surgery residents on the impact of the CCRI on education and patient care. The goal of this study is to expand this inquiry to multiple other resident specialties in the critical care setting, as well as to compare resident experiences preceding versus after implementation of the CCRI model.

**Methods:**

The Qualtrics survey platform was utilized to send anonymous surveys to residents within the specialties of anesthesiology (AN), emergency medicine (EM), internal medicine (IM), and general surgery (GS). Demographic information elicited included post-graduate training year (PGY), specialty, and chronological relationship to implementation of CCRI. 4-point Likert Scale and free text questions were included.

**Results:**

Of 138 total residents (16 AN, 46 EM, 51 IM, 25 GS), 82 completed the survey (59.4%). Respondent stratification included 31 PGY-1 (38%), 22 PGY-2 (27%), 17 PGY-3 (21%), 6 PGY-4 (7%), 6 PGY-5 (7%); 11 AN (14%), 18 EM (22%), 29 IM (35%), 24 GS (29%); 7 (9%) only before CCRI, 26 (32%) before and after, and 48 (59%) only after implementation. Composites of strongly agree/agree on positive perception of attending availability (95%), improved patient care (98%), education (87%), and procedural skill (78%) and disagree/strongly disagree on perception of CCRI limiting autonomy (79%) or detracting from education (83%) were noted.

**Conclusions:**

The CCRI model was implemented to enhance both educational and clinical support of residents in the ICU overnight; however, consideration is given to the perceived impact on resident education and autonomy. Across multiple disciplines and post-graduate training years, residents have indicated a favorable perceived impact of the CCRI on education, clinical support, and procedural skill with no significant impairment to autonomy.

# Impact of Critical Care Resource Intensivist (CCRI) on Multispecialty Resident Education

Daniel Weigle, DO\*; Christopher Izzo, DO; Camille Meschia, MD; Jeanette Zhang, MD; Marie Crandall, MD, MPH; David Skarupa, MD\*\*; and the CCRI Research Group

## BACKGROUND

- Critical care (CC) is a core component of inpatient care and resident education across multiple specialties.
- At our institution, no faculty was in the hospital with a primary responsibility for the ICUs at night
- Resident supervision in the ICUs relied on out of the ICU resources from anesthesia, emergency medicine, and acute care surgery.
- These physicians had primary responsibility for OB and the OR, an overcrowded ED, and trauma and emergency general surgery patients
- This model resulted in sparse resident supervision and inadequate access to attending-level support.
- A multidisciplinary team of critical care resource intensivists (CCRI) was implemented to provide enhanced attending-level resources and supervision to ICU residents overnight.
- A previous study was conducted to determine the perceived impact of the CCRI on education and patient care among general surgery residents and showed positive results.<sup>1</sup>
- The current study is aimed at expanding this inquiry to include residents from other specialties that rotate in the ICUs, and to compare resident experiences before and after the implementation of the CCRI model.

## METHODS

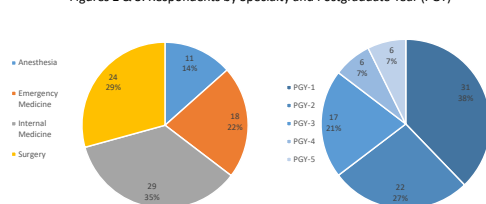
- An anonymous survey was sent to residents in the specialties of anesthesiology (AN), emergency medicine (EM), internal medicine (IM), and general surgery (GS) via the Qualtrics platform, using both 4-point Likert Scale and free text questions.
- Demographic information included post-graduate training year (PGY), specialty, and chronological relationship to implementation of CCRI.

## RESULTS

Table 1. Survey Responses

	Strongly Agree	Agree	Disagree	Strongly Disagree	Total
Overnight ICU call provides a good educational experience during residency training	59 (72%)	18 (22%)	5 (6%)	0 (0%)	82
On nights without overnight CCRI attending coverage, when I needed assistance there was an attending immediately available to assist me at the bedside	11 (15%)	18 (25%)	32 (45%)	11 (15%)	72
On nights when there is CCRI attending coverage, when I need assistance, there is an attending immediately available to assist me at the bedside	55 (70%)	20 (25%)	4 (5%)	0 (0%)	79
I feel comfortable asking for assistance from the CCRI attending	46 (57%)	31 (38%)	4 (5%)	0 (0%)	81
Implementation of CCRI system is associated with better patient care	45 (55%)	35 (43%)	2 (2%)	0 (0%)	82
Implementation of CCRI system has positively impacted residents' education	36 (45%)	34 (42%)	10 (12%)	1 (1%)	81
Implementation of CCRI system has improved residents' procedural skills	28 (34%)	36 (44%)	16 (20%)	2 (2%)	82
Implementation of CCRI system has improved residents' supervision overnight	51 (62%)	27 (33%)	3 (4%)	1 (1%)	82
Implementation of CCRI system has limited residents' autonomy and decision-making abilities	5 (6%)	12 (15%)	46 (56%)	19 (23%)	82
Implementation of CCRI system has detracted from resident to resident education	4 (5%)	10 (12%)	48 (59%)	20 (24%)	82

Figures 2 & 3. Respondents by Specialty and Postgraduate Year (PGY)



- 82 out of 138 residents across all specialties, completed the survey with a 59.4% response rate.
- Distributions of specialty and PGY are shown in **Figures 2 and 3.**
  - 7 (9%) only before CCRI, 26 (32%) before and after, and 48 (59%) only after implementation
- Composite results of strongly agree/agree reflect a positive perception of attending availability (95%), improved patient care (98%), education (87%), and procedural skill (78%) **Figure 1.**
- Composite results of disagree/strongly disagree reflect a negative perception of CCRI limiting autonomy (79%) or detracting from education (83%) **Figure 1.**

Figure 1. Survey Responses

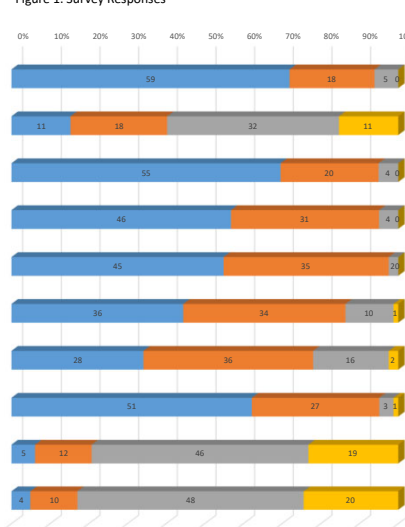
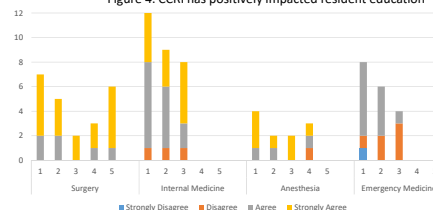


Figure 4. CCRI has positively impacted resident education



## CONCLUSIONS

- Overall, the results of this study demonstrate that residents from multiple traditional academic departments perceive the CCRI model as beneficial, both in terms of clinical support and educational edification versus the prior model of attending coverage without a dedicated fellowship trained intensivist for the ICUs.
- While cumulatively demonstrating positive perception of the CCRI role, some variation in resident opinion existed between specialties, with the most positive perceptions from GS, AN and IM residents **Figure 4.**
- This study, taken together with the prior study conducted with general surgery residents, points to a potentially improved system of care within the context of graduate medical education in CC.

## REFERENCES

- <sup>1</sup> Zhang, Jeanette et al, "Impact of Overnight In-house Critical Care Resource Intensivist on General Surgery Education." Jacksonville, FL, 2022.
- <sup>2</sup> Rehder KJ, et al. Perceptions of 24/7 in-house intensivist coverage on pediatric housestaff education. Pediatrics. 2014;133(1):88-95.

## CCRI RESEARCH GROUP

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