


ORIGINAL RESEARCH

A case-study of the experiences of junior medical officers in the emergency departments of a metropolitan hospital and rural hospital

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Abstract

Objective: Increased exposure to post-graduate rural medical training is associated with increased likelihood of future rural practice. Training rotations in rural emergency departments provide a possible avenue for such exposure, but have been under-investigated. This study aimed to compare junior medical officers' emergency department experiences in a metropolitan and a rural hospital to inform rural health workforce initiatives.

Design: Mixed-method case-study design.

Setting: Two 10-week periods in the respective emergency departments.

Participants: Four junior medical officers at the rural site and 22 junior medical officers at the metropolitan hospital.

Main outcome measures: Caseloads extracted from electronic medical records and training experience.

Results: Data were collected over 142 days. The average number of patients seen per day, per junior medical officer, was significantly higher at the rural hospital emergency department (7.2 patients per day) in comparison with the metropolitan hospital (4.3 patients per day). Junior medical officers at the rural hospital saw relatively more lower acuity patients. The seven junior medical officers who were interviewed provided consistently positive responses regarding their training experiences in both locations. This was particularly evident in the rural hospital and was attributed to one-on-one supervision.

Conclusions: Most junior medical officers agreed that their expectations for support and learning opportunities were met and/or exceeded. However, junior medical officers reported feeling more supported at the rural hospital due to direct contact and communication with senior medical officers. Placement in a smaller hospital emergency department did not disadvantage the junior medical officers' training in this case-study and provided a positive rural training experience. These findings support workforce policies which encourage rural hospital emergency department training.

KEYWORDS

Australia, emergency department, junior doctors, medical education, medical workforce, rural health

1 | INTRODUCTION

The reduced access to doctors in rural and remote Australia^{1,2} contribute to our nation's significant health inequities.^{2,3} Research evidence suggests that increased exposure to post-graduate rural medical training experiences are associated with increased likelihood of future rural practice.⁴⁻⁶ In addition, it has been reported that junior doctors exposed to rural general practice placements benefited from improved communication skills; professionalism; and autonomy in clinical decision-making.⁷ Given the potential benefits of rural-based training for medical workforce quality and distribution, the Australian government has implemented a number of initiatives. For example the Australian Government's "Pre-vocational General Practice Placements Program" (PGPPP) aimed to encourage junior medical officers (JMOs) to consider a career in general practice, including experience in rural GP run rural hospitals.⁸ Funding for the PGPPP ceased 31 December 2014 and was replaced by the Rural Junior Doctor Training Innovation Fund for rural primary care rotations for rural-based Postgraduate Year 1 (PGY1) JMOs in December 2015.⁹ Australian studies from teaching hospitals report that JMOs have variable access to patients during their hospital ward-based rotations and spend a substantial amount of time completing administrative tasks rather than in direct patient care.^{10,11} JMOs in metropolitan hospitals spend relatively more time in direct clinical care during emergency department (ED) rotations, although concerns have been expressed regarding timely access to senior advice and educational activities as JMO numbers increase.¹² It is possible that there is a potential for more direct clinical and supervisory contact in smaller rural facilities, making training rotations in rural hospital EDs an attractive option for JMOs. To the knowledge of the authors, no research has compared training experience across metropolitan and rural ED locations in Australia. Within the Local Health District (LHD) studied, JMOs spent one rotation (approximately 10 weeks) in the ED of a hospital in a metropolitan city and had the additional option of a PGPPP rotation (approximately 10 weeks) in a rural GP practice, which serviced a rural hospital. This provided an opportunity to compare the caseloads and training experiences of JMOs in different ED environments within one LHD with the aim of informing health workforce initiatives.

2 | METHODS

A mixed-methods case-study design was adopted. The ED caseloads for JMOs working in each hospital were estimated during two 10-week periods: 30 January-13 April 2014 and 30 June-7 September 2014. The time periods were chosen to reflect summer and winter caseloads. The

What is already known on this subject:

- There is a relative under-supply of doctors in rural Australia.
- There is evidence that increasing length of post-graduate rural medical training is associated with increased likelihood of future rural practice.
- Teaching hospital emergency department (ED) rotations for junior medical officers (JMOs) provide more direct clinical exposure than ward rotations.
- The learning experience provided by rural hospital ED rotations for JMOs in comparison with teaching hospital ED rotations is under-researched.
- It is important to understand this experience as a component of positive rural training options for JMOs.

What this study adds:

- We compared the learning experiences of JMOs in a metropolitan hospital ED and rural hospital ED using a mixed-methods case-study design.
- The learning experience in the rural ED was positive and complemented the experience in the metropolitan hospital ED.
- In the rural ED, JMOs saw a relatively higher number of cases but of lower acuity.
- Junior medical officers valued the close team environment and supervision in the rural ED.
- The case-study provides support for including well-supervised ED rural rotations in rural medical workforce initiatives.

metropolitan hospital is a major referral and teaching hospital with more than 500 beds, situated in a Modified Monash Model (MMM) Class 1 area.¹³ The rural hospital provides emergency, general medical and minor surgical services and ambulatory care. The hospital is situated in a town more than 200 km from Sydney (MMM 4),¹³ with a population of 1448.¹⁴ De-identified aggregate unit record data was collected for all ED presentations seen by a JMO, at both participating hospitals, for the specified time periods. Data collected included: site; date and time; patient age; patient's sex; triage level; and diagnosis. Logistic and linear mixed effects regression models were used for statistical analyses. As only one triage category 1 encounter was recorded for the period, this category was excluded from analyses. R version 3.3.1 (The R Foundation for Statistical Computing, Vienna, Austria, 2016) was used for statistical analyses. JMOs who had completed their ED hospital rotations or PGPPP placements at either or both of the hospitals were invited to participate in the semi-structured telephone interviews.

	Metropolitan hospital (n = 4403)	Rural hospital (n = 843)
Male	2031 (46.1%)	459 (54.4%)**
Female	2372 (53.9%)	384 (45.6%)**
Mean age (y)	52.1 (SE 0.4)	46.0 (SE 0.9)**
Mean number of patients seen per day per junior medical officer in emergency department	4.3 (SE 0.1)	7.2 (SE 0.3)**

Abbreviation: SE, standard error.

** $P < 0.001$.

TABLE 1 Case-load description

Patients seen by JMO for each triage category by facility 1 = most urgent 5 = least urgent	Metropolitan hospital (n = 4403)	Rural hospital (n = 843)
Category 1	—	—
Category 2	6.4 (SE 0.8)	10.5 (SE 2.2)
Category 3	97.2 (SE 5.4)	62.5 (SE 4.3)*
Category 4	91.5 (SE 4.7)	119.7 (SE 9.4)*
Category 5	4.9 (SE 0.6)	18.0 (SE 2.9)**

Abbreviation: SE, standard error.

* $P < 0.05$; ** $P < 0.001$.

TABLE 2 Comparison of mean number of patients seen per junior medical officer (JMO) in each facility by triage category

The interview guide included questions regarding patient caseload, supervision, confidence and most valued experiences. All interviews were audio recorded, de-identified and transcribed verbatim. The transcripts were analysed using a pragmatic template analysis approach.¹⁵ Three researchers independently read and became familiar with a subset of transcripts, then developed a coding template designed to capture data that could directly contextualise or extend the quantitative data set in this mixed-methods study. The template was applied to all transcripts and a descriptive approach was used to develop thematic categories focused on comparing settings, clinical experiences and supervision of the JMOs.

2.1 | Ethics approval

Ethics approval was gained from the University of Wollongong and Illawarra Shoalhaven Local Health District Human Research Ethics Committee (HE14/314).

3 | RESULTS

Data were collected over 142 days for four PGY1 JMOs at the rural site (843 patient encounters) and 22 PGY1 JMOs at the metropolitan hospital (4403 patient encounters). The average age of patients was significantly lower at the rural

site (46 years) in comparison with the metropolitan hospital (52 years) and a greater proportion of male patients were seen at the rural site (54%), in comparison with the metropolitan hospital (46%). The average number of patients seen per day, per JMO, was significantly higher at the rural hospital ED (7.2 patients per day), in comparison with the metropolitan hospital (4.3 patients per day; Table 1).

There were a relatively small number of triage categories 2 and 5 patient encounters for JMOs at both hospitals. JMOs at the metropolitan hospital saw significantly more triage category 3 patients than their rural counterparts and significantly fewer triage categories 4 and 5 cases (lowest acuity). There were no significant differences in the mean number of triage category 2 patients seen between facilities over the study period (Table 2).

Pain, including abdominal pain, was the most common presentation seen by JMOs at the metropolitan hospital. By contrast, lacerations and urinary tract infections were the most commonly seen presentations among JMOs in the rural hospital (Table 3).

Seven JMOs agreed to participate in interviews (25% response rate) which took approximately half-an-hour to complete. Of these, six had worked at both facilities and one participant had worked only at the metropolitan hospital. Four themes were developed and are reported below: benefits from experiencing both settings; supported by supervision; comparing organisational complexity; and access to increased acuity.

TABLE 3 Ranked five most common presentations seen by junior medical officers in emergency department

Discharge diagnosis	Metropolitan Hospital (n = 4403)		Rural Hospital (n = 844)	
	Men (n = 2013)	Women (n = 2372)	Men (n = 460)	Women (n = 384)
General pain, other than abdominal, chest or back	1	2	4	2
Chest pain	2	4	—	5
Fractures	3	3	3	3
Injury	4	—	2	—
Cellulitis	5	—	5	—
Abdominal pain	—	1	—	—
Falls	—	5	—	—
Lacerations	—	—	1	4
Urinary tract infections	—	—	—	1

3.1 | Benefits from experiencing both settings

Overall, the JMOs in this study reported positive experiences of their time in both hospitals' EDs: "I started in [rural hospital] and then [the metropolitan hospital]; it was very different and really good to experience both back to back." (JMO 7) It was generally agreed that there were differences between the two EDs, mediated by their size, accessibility to a range of experiences and the type of supervision provided. The majority of the JMOs identified benefits and drawbacks of both settings: "In [rural hospital], I got to see and do a lot more because it's just you and the senior GP or registrar there. The difference is at [the metropolitan hospital] you've got a lot more tests you can do to finalise a diagnosis whereas in [rural hospital] you are relying on your clinical history and examination skills, so it's really good for a junior doctor in that way. [The metropolitan hospital] is great though because there are more senior people around and you can talk to all the different registrars of whatever specialty." (JMO 5) While the differences between the two sites were clearly articulated, most JMOs still stressed that valuable learning took place in both settings: "I learnt equally as much on both rotations - just very different." (JMO 7)

3.2 | Supported by supervision

Despite the JMOs varied experiences, the level of supervision in both settings was perceived to be excellent. Participants repeatedly emphasised that they were closely supervised in both departments and felt they had access to expert assistance at all times. "Every single patient that I saw in both places, I was completely supervised. I was always fully supervised regardless of where I was." (JMO 3) Although the JMOs agreed that supervision was good in both settings, the accessibility and one-on-one

organisation of supervision at the rural hospital appeared to facilitate relationship building in a way that was not replicated at the metropolitan hospital: "It's different in that it's usually only you and one other doctor and two or three nursing staff so you really feel very involved in the process and you actually really feel like you're making a difference." (JMO 4)

3.3 | Comparing organisational complexity

All participants who had interned at both the rural and metropolitan hospitals (n = 6) felt that they saw more patients at the rural hospital than at the large hospital. "In [the metropolitan hospital] I would see anywhere between three and six (patients per day). In [rural hospital] I'd see anywhere between 10 and 15 [patients]." (JMO 3) The JMOs felt the increased caseload at the rural ED was due to contextual factors associated with that facility: the lower acuity and faster patient turnover; less time spent waiting to consult with senior doctors; fewer JMOs competing for clinical exposure; and longer shifts. In the metropolitan hospital, the size and organisational complexity of the unit acted to slow down the processes associated with patient turnover: "In [the metropolitan hospital] it takes a long time to talk to a supervisor because they might be caught in a resus or doing something else... Whereas in [rural hospital] I found it was happening a lot faster because it was just the two of you." (JMO 2)

3.4 | Access to increased acuity

While only a small number of critically ill patients were seen overall, the JMOs frequently reported that they saw more categories 1 and 2 patients at the rural hospital than at the metropolitan hospital, despite the patient numbers recorded

in Table 2. "In [rural hospital] I was involved in all of them. For category 1, I was always there for the entire time - just observing. Whereas in [the metropolitan hospital], I wasn't involved in any cat 2 or 1 pretty much. That's all for the registrars or residents or above." (JMO 7) The majority of JMOs believed that they had access to a broader range of patient acuity and triage categories at the rural hospital: "[The rural hospital] was the complete range of patients so I saw lots of patients who didn't need any treatment at all, right through to patients who had a triage category of one and had either died or were dying at the time. But it's very unusual for the intern to see a patient who is severely ill at [the metropolitan hospital] because the registrars usually see those patients." (JMO 1)

4 | DISCUSSION

In our case-study, the mixed-methods data constructed a consistent picture of complementary, valuable learning experiences in the ED of each facility. Consistent with their perceptions related at interview, the JMOs working at the rural ED saw a greater number of patients per day, predominantly those with lower triage priority. The quantitative data demonstrated that no category 1 patients were seen by JMOs at the rural hospital, but this differed from participants' recollections. This might be explained by the fact that senior staff were in charge of categories 1 and 2 cases and were recorded as such in hospital records. Therefore, a JMO could have observed or worked alongside a senior colleague without appearing as the responsible clinician in the electronic records that were reviewed in this study. It appears that the one-on-one supervision at the rural hospital, as well as the smaller size and lack of hierarchical organisation facilitated the perception that there was more contact with categories 1 and 2 patients. The JMOs repeatedly stated that in the rural ED they worked closely with a small team, built positive relationships with their supervisors and gained confidence from this experience. This was reinforced quantitatively by higher numbers of patient encounters and procedures such as laceration repair. These findings were consistent with those from previous investigations of rural GP placements for JMOs⁷ and medical students.¹⁶ Most of the participants found that their experiences in both hospitals were valuable and that they received high-quality supervision and ongoing opportunities for learning at both sites. Previous research has demonstrated concerns regarding the ratio of administrative to clinical tasks for JMOs in hospital wards in Australia^{10,11} and internationally,¹⁷ with better clinical exposure in EDs.¹² Our data add to those findings by indicating complementary benefits from rural ED rotations arising from being responsible for a higher caseload of lower acuity cases as part of a small team.

It should be noted that this is a case-study within one geographical region and concerning a limited cohort of participants. The effect of self-selection by participants for the PGPPP rotation should also be considered in interpreting the findings. The nature of the medical records also precluded ascertaining if a JMO had been involved in a supporting role in a case, where they were not listed as the responsible medical officer. Thus, the reader will need to apply caution, and consider contextual differences carefully, in transferring the findings from this research to other sites.

Our findings indicated that ED rotations for JMOs in both the metropolitan and rural hospital provided valuable and complementary learning experiences. Placement in a smaller hospital ED did not disadvantage the JMOs, training in this case-study and provided a positive rural training experience. These findings support workforce policies which encourage well-supervised rural hospital ED training. Future research should be directed towards increasing our understanding of the effects of rural training on the development of specific clinical competencies, for example through use of other data sources including procedural logbooks, in addition to training experiences and career choices.⁷

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CONFLICT OF INTEREST

At the time this study was undertaken: Sharon Flynn was CEO, and Andrew Bonney and Brett Thomson paid GP supervisors, for CoastCityCountry GP Training; Brett Thomson supervised PGPPP JMOs at Milton-Ulladulla Hospital; and Tom Carrigan was the Illawarra - Shoalhaven District Director of Emergency Medicine.

AUTHORS CONTRIBUTION

Andrew Bonney involved in design, analysis, drafting/revising and approval of the manuscript. Judy Mullan, Athena Hammond and Pippa Burns involved in analysis, drafting/

revising and approval of the manuscript. Georgia Yeo involved in data acquisition, analysis, drafting/revising and approval of the manuscript. Brett Thomson and Sharon Flynn involved in inception, design, drafting/revising and approval of the manuscript. Tom Carrigan involved in design, drafting/revising and approval of the manuscript.

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