

# Gender differences in Australian general practice trainees performing procedures related to women's reproductive health

## *A cross-sectional analysis*

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### Background and objectives

Gender differences may exist in the performance of women's reproductive procedures. The aim of this study was to investigate the prevalence and association of general practice registrars' performance of women's procedures with trainees' gender, rurality of practice and in-consultation seeking of information or assistance.

### Method

This was a cross-sectional analysis of a cohort study of registrars' consultations in 2010-17. Registrars recorded 60 consecutive consultations during each six-month training term. The outcome was performance of a procedure related to women's reproductive health.

### Results

Of 24,333 procedures performed in 332,700 encounters, 15,634 were on female patients and 6025 of those included procedures relating to women's reproductive health; 5002 were Pap smears (20.6%). Only 235 (4.7%) Pap smears were performed by male trainees. Performing women's procedures was significantly associated with trainees' gender, with an adjusted odds ratio of 4.80 (95% confidence interval: 4.10, 5.61).

### Discussion

Our findings suggest that a gender difference exists in general practice trainees' frequency of performing women's procedures. Male trainees require more opportunities and support from their preceptors, clinical settings and training programs to perform these procedures.

**OFFICE-BASED PROCEDURAL SKILLS** are an important component of general practice. The acquisition of high-quality procedural skills by the next generation of general practitioners (GPs) depends on opportunities for general practice trainees to perform these procedures. In recent years, a number of institutions and organisations have developed core procedural skills lists for general practice trainees,<sup>1-3</sup> including a list developed by Sylvester et al (via a Delphi process) for Australian general practice trainees to be used as a resource for general practice procedures training curricula.<sup>4</sup>

These lists include procedures related to women's reproductive health; general practice trainees are expected to have gained experience in performing these procedures prior to entering independent practice. However, there is limited knowledge of the extent to which general practice trainees obtain experience in performing these procedures and if male general practice trainees have the same opportunity to perform female procedures as female trainees.

Previous research suggests male undergraduate medical students are disadvantaged in acquisition of practical examination skills in obstetrics and gynaecology.<sup>5-8</sup> Consequently, male GPs report significantly less comfort and lower skill levels when performing breast examinations and Pap smears.<sup>9</sup> Patients of male physicians have been found to have lower rates of breast and cervical cancer screening, compared with patients of female physicians in both urban and rural centres.<sup>10</sup> Therefore, despite studying the same curriculum, gender differences may exist in medical trainees' experience in learning procedures related to women's reproductive health.<sup>11</sup>

The aim of this study was to document the prevalence and associations of general practice trainees' performance of procedures related to women's reproductive health. Of particular interest were associations between frequency of performance of these procedures and trainees' gender, rurality of practice and in-consultation seeking of information or assistance.

### Method

We performed a cross-sectional analysis of data from the longitudinal Registrar Clinical Encounters in Training (ReCEnT) study.<sup>12</sup> ReCEnT is an ongoing multicentre cohort study of general practice trainees' in-consultation clinical and educational experiences. Participants

were general practice trainees enrolled (2010–17) with five of Australia's 17 GP regional training providers (RTPs) across five of Australia's six states, and (from 2016) with three of Australia's nine regional training organisations in three states (stemming from a major restructure of Australian general practice training in late 2015).

In ReCEnT, general practice trainees undertake data collection once in each of three six-month training terms (or per 12-month term for part-time registrars) as an integral part of their educational program.<sup>13</sup> Informed consent is obtained for general practice trainees' de-identified data to be used for research purposes. Initial data collection includes general practice trainees' demographic data and characteristics of the practice in which they are working. Data are recorded by each general practice trainee each training term. General practice trainees also record detailed data of 60 consecutive clinical consultations per term via a paper-based encounter form. Data collection is performed approximately midway through the term. As data collection is intended to reflect 'normal' general practice activity, consultations in a specialised clinic – for example, a vaccination clinic – were excluded. Only office-based consultations (not home visits, nursing home visits or hospital-based visits) were recorded. The in-consultation data encompassed four broad areas:

- patient demographics
- diagnoses/problems managed
- investigations/management (including referral and follow-up)
- educational training aspects (whether the registrar sought in-consultation advice or information from their clinical supervisor or from other sources, or generated learning goals).

### Outcome factor

The outcome factor was performance of a procedure related to women's reproductive health. This was defined by a list of procedures ReCEnT had adopted from the core list developed by Sylvester et al<sup>4</sup> and comprises Pap smears, high vaginal swabs (HVS), insertion and removal of Implanon, insertion and removal of an intrauterine

device, insertion of hormone implant by trochar or cannula, aspiration of a breast cyst, and diaphragm fitting and insertion. Sensitivity analysis, excluding Pap smears and HVS, was also performed.

### Independent variables

Independent variables recorded were related to patient (age, Aboriginal or Torres Strait Islander status, non-English speaking background, new to the practice/new to the trainee), trainee (age, gender, part-time/full-time workload, training term, Australian graduate/international medical graduate, previous training in the practice), practice (rurality, practice size, socioeconomic status, billing, RTP) and consultation (whether the trainee sought in-consultation advice, assistance or information related to the procedure from their supervisor or other physicians in the practice; whether the consultation related to a new problem; number of problems; duration of consultation). Practice postcode was used to define the Australian Standard Geographical Classification-Remoteness Area classification (degree of rurality) and the Socioeconomic Index for Areas, Index of Relative Socio-Economic Disadvantage of the practice location.<sup>14</sup>

### Statistical methods

The unit of analysis was the individual problem/diagnosis rather than the trainee consultation. Proportion of problems/diagnoses for which a procedure related to women's reproductive health was performed was calculated with 95% confidence intervals (CI). Only female patients were included in this analysis.

The majority of procedures related to women's reproductive health were Pap smears and HVS performed by female trainees; therefore, we performed a sensitivity analysis excluding these two procedures to examine our hypothesis in the other procedures related to women's reproductive health. Primary analysis included all problems/diagnoses; sensitivity analysis excluded all problems/diagnoses where Pap smear or HVS were performed. To test associations of a problem/diagnosis involving performance of a procedure related to women's reproductive health, simple and

multiple logistic regression were used within a generalised estimating equation framework to account for the repeated measures of patients on trainees. No adjustment was made to also account for repeated measures of trainees on practice as previous analyses in this dataset have consistently shown this does not have an effect. All variables with a *P* value <0.2 and relevant effect size in the univariate analysis were included in the multiple regression models. Variables that had a small effect size (odds ratio [OR] >0.9 and <1.1) and were no longer significant in the multivariate model (*P* >0.2) were removed from the final model as long as removal of the variable did not change the resultant model (a change of at least 10% to the OR).

All analyses were conducted using Stata statistical software (version 14.0) and SAS (V9.4), and *P* values <0.05 were considered statistically significant.

### Ethics approval

The ReCEnT project has approval from the University of Newcastle Human Research Ethics Committee (reference H-2009-0323).

### Results

A total of 1659 general practice trainees contributed 3676 rounds of data collection, including 332,700 problems/diagnoses, of which 207,760 (62.5%) problems/diagnoses were with female patients. Table 1 shows trainee and practice demographics.

Of 24,333 procedures performed in all encounters, 15,634 were on females, and 6025 of those were procedures related to women's reproductive health (24.8%; 95% CI: 24.4, 25.3 of all procedures and 38.5%; 95% CI: 37.8, 39.3 of all procedures in women). There were 5002 Pap smears, which equated to 20.6% of all procedures. Excluding Pap smears and HVS, there were 493 procedures related to women's reproductive health, equating to 2.0% (95% CI: 1.8, 2.2) of all procedures. The list of procedures related to women's reproductive health is shown in Table 2.

Only 235 (4.7%) Pap smears were performed by male trainees, whereas

4767 (95.3%) were performed by females trainees. The same trend was observed for HVS: 28 (5.3%) were performed by male trainees, whereas 502 (94.7%) were performed by female trainees.

### Associations of problems/diagnoses involving procedures related to women's reproductive health being performed

The characteristics of the trainees performing a procedure related to women's reproductive health are presented in Appendix 1 (available online only). Results from the multivariable model are presented in Table 3. Performing procedures related to women's reproductive health was

significantly associated with trainees' gender (adjusted odds ratio [AOR] for females: 4.80; 95% CI: 4.10, 5.61). Performing procedures related to women's reproductive health was also positively associated with the problem/diagnosis being new (AOR: 2.05; 95% CI: 1.82, 2.31) and with the patient being new to the trainee (AOR 1.20; 95% CI: 1.10, 1.30), but negatively associated with the patient being new to the practice (AOR: 0.78; 95% CI: 0.67, 0.91). Performing these procedures was associated with less seeking of in-consultation information, advice or assistance compared with other problems/diagnoses (AOR: 0.28; 95% CI: 0.24, 0.32).

### Associations of problems/diagnoses involving procedures related to women's reproductive health (excluding Pap smears and HVS) being performed

The characteristics of the trainees performing a procedure related to women's reproductive health (excluding Pap smears and HVS) are presented in Appendix 2 (available online only). Table 4 shows the results from the multivariable model. Performing procedures related to women's reproductive health (excluding Pap smears and HVS) was significantly associated with general practice trainees' gender (AOR for female: 1.48; 95% CI: 1.10, 2.00) and the trainee being in Term 3 (ie a more experienced trainee; AOR: 2.19; 95% CI: 1.55, 3.08). Performing procedures related to women's reproductive health was also associated with the problem/diagnosis being a new problem/diagnosis (AOR: 4.74; 95% CI: 3.39, 6.62); however, it was negatively associated with the patient being new to the practice (AOR: 0.24; 95% CI: 0.14, 0.42) or new to the trainee (AOR: 0.39; 95% CI: 0.30, 0.52).

**Table 1. Characteristics of registrars and practices**

Registrars and registrar-round characteristics		n (%)
<b>Registrar characteristics (n = 1659)</b>		
Gender	Male	596 (35.9)
	Female	1063 (64.1)
Qualified as a doctor in Australia	Yes	1358 (82.5)
<b>Registrar-round characteristics (n = 3676)</b>		
Age (years)	Mean ± SD	32.4 ± 6.2
Registrar training term	Term 1	1552 (42.2)
	Term 2	1177 (32.0)
	Term 3	947 (25.8)
Registrar worked at the practice previously	Yes	884 (24.4)
Registrar works full time	Yes	2776 (77.6)
<b>Practice characteristics (n = 3077)</b>		
Practice routinely bulk bills*	Yes	728 (21.1)
Number of full-time equivalent GPs working at the practice	1-5	1248 (35.0)
	6+	2,322 (65.0)
Rurality of practice	Major city	2166 (59.0)
	Inner regional	944 (25.7)
	Outer regional or remote	563 (15.3)
SEIFA†	Mean ± SD	5.6 ± 2.9

\*Bulk bills means no financial cost to the patient

†Socioeconomic Index for Areas (SEIFA): Relative Index of Disadvantage for the practice

## Discussion

In this study, we found that one-fifth of all procedures performed by general practice trainees were Pap smears, which were predominantly done by female trainees. Male trainees performed <5% of Pap smears and HVS. Even when the ratio of female to male trainees (16:9) is considered, these findings suggest that male trainees have very limited opportunities to learn and practice procedures relating to women's reproductive health. This may result in disadvantage for some female patients, especially in rural areas where there may not be adequate access to female physicians for cervical cancer screening. Given the clinical consequences of suboptimal cervical cancer screening,<sup>15</sup> this may be a significant health access issue.

Pap smears comprised 28% of all procedures performed by established Australian GPs in 2015-16.<sup>16</sup> This is comparable to our findings that Pap smears accounted for 20% of all

procedures performed by general practice trainees. Although we do not know if more Pap smears are performed by female than by male GPs in Australia, previous studies have found patients of male physicians have a lower rate of breast and cervical cancer screening.<sup>10</sup>

We found that performing procedures related to women's reproductive health, including Pap smears, was significantly associated with the patient being new to the trainee. An interpretation is that female patients may be selecting female over male trainees to perform Pap smears, despite not having seen them previously in the practice. However, when we excluded the Pap smears and HVS from the analysis, the effect size of the association with female trainees' gender was smaller. In addition, performing procedures other than Pap smears and HVS was associated with trainees being more experienced and with patients not being new to the trainees. This may reflect non-Pap procedures being less 'routine' than Pap smears and being more likely to be performed by trainees who had been involved in the assessment and management at prior consultation

of the problem/diagnosis, necessitating the procedures.

Previous studies have shown that female patients are less likely to consent to male medical students performing intimate (eg breast, pelvic) examinations,<sup>5</sup> and patients have a preference for GPs of a particular gender for intimate procedures.<sup>5,17</sup> Although we were not able to explore the role of the preceptors or the level of support from staff in our study, these two factors have been shown in the literature to contribute as potential factors in the high number of women's procedures being done by female trainees.<sup>6,8</sup>

Strengths of this study include the large number of consultations recorded. The high response rate and inclusion of data from five Australian states across all rurality classifications, from major city to very remote areas, suggest excellent generalisability of these findings to other training programs.

A potential limitation of the study is bias inherent in busy clinicians recording in-consultation data. As procedures are discrete and important elements in any consultation, however, we feel this is unlikely to be a substantive source of bias in this analysis. Another limitation is that we cannot measure the role of supervisors or practice staff to assess the opportunities for male trainees to perform procedures related to women's reproductive health.

## Implications for general practice

Our findings suggest that gender differences exists in the performance of procedures related to women's reproductive health by general practice trainees. Male trainees perform fewer procedures related to women's reproductive health and, therefore, have less opportunity to practise during their training. In addition, the recently introduced changes in the interval of cervical cancer screening (from two to five years) and the option for self-collected human papillomavirus testing will further decrease trainees' opportunities to perform cervical cancer screening. Trainees, especially male trainees, will therefore require more opportunities and support from their preceptors to

gain experience with certain procedures. There is a need to increase awareness of this issue among training programs, and educators must be attuned to potential gender differences in gender-specific procedural experiences to ensure that all trainees, regardless of gender, are offered opportunities for participation. Clinical settings that host trainees may also need to consider methods of encouraging patients to accept trainees' participation regardless of their gender.

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**Table 2. Frequency of women's reproductive health procedures**

Procedures	Frequency (%)
Pap smear	5002 (83.02)
High vaginal swab	530 (8.80)
Insertion of Implanon rod	257 (4.27)
Removal of Implanon rod	164 (2.72)
Removal of intrauterine device	40 (0.66)
Insertion of intrauterine device	24 (0.40)
Aspirate breast cyst	3 (0.05)
Insertion of hormone implant by trochar	3 (0.05)
Bartholin cyst marsupialisation	1 (0.02)
Diaphragm fitting and insertion	1 (0.02)
<b>Total</b>	<b>6025</b>

**Table 3. Associations with a women's reproductive health procedure being performed\***

Variable	Class	Univariate		Adjusted	
		OR (95% CI)	P	OR (95% CI)	P
<b>Patient variables</b>					
Patient age group	0–18	0.12 (0.10, 0.14)	<0.001	0.23 (0.19, 0.28)	<0.001
Referent: 19–34	35–64	0.78 (0.74, 0.83)	<0.001	0.92 (0.85, 0.98)	0.018
	≥65	0.16 (0.14, 0.19)	<0.001	0.26 (0.22, 0.30)	<0.001
Non-English speaking background	Yes	1.14 (1.01, 1.28)	0.033	1.07 (0.93, 1.24)	0.320
Patient/practice status	New to practice	1.62 (1.42, 1.84)	<0.001	0.78 (0.67, 0.91)	0.002
Referent: existing patient	New to registrar	1.56 (1.45, 1.67)	<0.001	1.20 (1.10, 1.30)	<0.001
<b>Registrar variables</b>					
Registrar gender	Female	6.49 (5.67, 7.42)	<0.001	4.80 (4.10, 5.61)	<0.001
Registrar age		0.99 (0.98, 1.00)	0.059	1.01 (1.00, 1.01)	0.140
<b>Practice variables</b>					
Practice size	Small	0.94 (0.86, 1.02)	0.149	0.98 (0.89, 1.07)	0.650
<b>Consultation variables</b>					
New problem seen	Yes	3.32 (2.97, 3.71)	<0.001	2.05 (1.82, 2.31)	<0.001
Sought help any source	Yes	0.36 (0.31, 0.40)	<0.001	0.28 (0.24, 0.32)	<0.001
Imaging ordered	Yes	0.42 (0.35, 0.49)	<0.001	0.34 (0.28, 0.41)	<0.001
Pathology ordered	Yes	34.5 (31.3, 38.0)	<0.001	32.6 (29.0, 36.7)	<0.001
Learning goals generated	Yes	0.41 (0.36, 0.47)	<0.001	0.49 (0.43, 0.56)	<0.001
Follow-up ordered	Yes	1.06 (0.98, 1.15)	0.150	0.54 (0.49, 0.59)	<0.001
Referral ordered	Yes	0.15 (0.12, 0.18)	<0.001	0.28 (0.23, 0.35)	<0.001
Consultation duration		1.04 (1.03, 1.04)	<0.001	1.04 (1.04, 1.05)	<0.001
Number of problems		1.21 (1.18, 1.25)	<0.001	0.85 (0.81, 0.89)	<0.001

\*Pap smears and high vaginal swabs were included in the analysis  
CI, confidence intervals; OR, odds ratio

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**Table 4. Associations with a women's reproductive health procedure being performed\***

Variable	Class	Univariate		Adjusted	
		OR (95% CI)	P	OR (95% CI)	P
<b>Patient variables</b>					
Patient age group	0–18	0.39 (0.30, 0.52)	<0.001	0.28 (0.20, 0.38)	<0.001
Referent: 19–34	35–64	0.27 (0.21, 0.34)	<0.001	0.25 (0.19, 0.33)	<0.001
	≥65	0.01 (0.00, 0.04)	<0.001	0.01 (0.00, 0.04)	<0.001
Patient/practice status	New to practice	0.56 (0.35, 0.89)	0.013	0.24 (0.14, 0.42)	<0.001
Referent: existing patient	New to registrar	0.52 (0.42, 0.65)	<0.001	0.39 (0.30, 0.52)	<0.001
<b>Registrar variables</b>					
Registrar gender	Female	1.85 (1.41, 2.44)	<0.001	1.48 (1.10, 2.00)	0.010
Term	Term 2	1.51 (1.18, 1.95)	0.001	1.41 (0.98, 2.03)	0.063
Referent: Term 1	Term 3	1.95 (1.48, 2.57)	<0.001	2.19 (1.55, 3.08)	<0.001
Registrar FT or PT	Part time	1.23 (0.96, 1.58)	0.010	1.06 (0.80, 1.41)	0.680
Worked at practice previously	Yes	1.58 (1.26, 1.99)	<0.001	1.18 (0.85, 1.63)	0.330
<b>Practice variables</b>					
Rurality	Inner regional	1.38 (1.08, 1.76)	0.011	1.18 (0.81, 1.71)	0.390
Referent major city	Outer regional/remote	1.76 (1.34, 2.31)	<0.001	1.32 (0.85, 2.04)	0.220
RTP	RTP 2	1.54 (1.05, 2.24)	0.026	1.57 (0.99, 2.48)	0.057
Referent: RTP 1	RTP 3	1.98 (1.42, 2.76)	<0.001	1.89 (1.23, 2.90)	0.004
	RTP 4	1.03 (0.76, 1.39)	0.850	1.15 (0.78, 1.71)	0.470
	RTP 5	2.37 (1.41, 3.98)	0.001	2.42 (1.20, 4.89)	0.014
	RTP 6	0.50 (0.23, 1.06)	0.072	0.82 (0.33, 2.01)	0.660
<b>Consultation variables</b>					
New problem seen	Yes	4.35 (3.24, 5.84)	<0.001	4.74 (3.39, 6.62)	<0.001
Imaging ordered	Yes	0.21 (0.10, 0.43)	<0.001	0.23 (0.11, 0.48)	<0.001
Pathology ordered	Yes	0.40 (0.28, 0.57)	<0.001	0.26 (0.17, 0.41)	<0.001
Follow-up ordered	Yes	0.75 (0.61, 0.92)	0.006	0.62 (0.48, 0.79)	<0.001

\*Pap smears and high vaginal swabs were excluded from the analysis

CI, confidence intervals; FT, full time; OR, odds ratio; PT, part time; RTP, regional training provider

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