Title: Australian general practice registrars and their experience with postpartum consultations: a cross sectional analysis of prevalence and associations

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Australian general practice registrars and their experience with postpartum consultations: a cross sectional analysis of prevalence and associations

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ABSTRACT:

Background: In Australia, general practitioners (GPs) are recognised as an essential source of postpartum care. However, there remains a paucity of research pertaining to this, and in particular, to that of GP trainees (in Australia, termed “registrars”). Previous post-graduate experience in obstetrics and gynaecology (O&G) is not a pre-requisite for GP training and thus it is imperative that vocational training provides adequate exposure to postpartum consultations.

Aim: To investigate the prevalence and associations of Australian general practitioner registrars’ (trainees’) experience in postpartum care.

Materials & Methods: A cross-sectional study employing data from the Registrar Clinical Encounters in Training (ReCEnT) project. ReCEnT is an ongoing cohort study where GP registrars’ record 60 consecutive consultations mid-way through each training term. The outcome variable was postpartum problem/diagnosis (compared to all other problems/diagnoses). The independent variables included registrar, practice, patient, consultation, clinical and educational factors. Analyses employed univariate and multivariable regression.

Results: Analysis included 2234 registrars (response rate 96.1%), 289,594 consultations, and 453,786 problems/diagnoses. Postpartum care (897) comprised 0.2% (95% CI: 0.19-0.21) of all problems/diagnoses in 0.3% (95% CI: 0.27-0.31) of all consultations. Significant multivariable associations included registrar’s gender (female) and obtainment of post-graduate O&G qualifications. Postpartum consultations were longer and resulted in more learning goals being generated.

Discussion: An overall low prevalence was established. Both male registrars, and those without pre-existing O&G qualifications, may have particularly limited experience. These findings should inform educational policy and practice regarding postpartum care experience in general practice training.

Introduction:

In Australia, general practitioners (GPs) provide a broad spectrum of care relating to antenatal care, pregnancy and the postpartum period¹. Postpartum care has been described as the “orphan”, or “poor sister”, of care to mothers and their babies, as it attracts less attention, less funding and less research². The majority of Australian women give birth in hospital environments and the average length of stay is between 2-4 days³. The modern emphasis on

“early discharge” highlights the need for comprehensive community-based postpartum follow-up.

Primary care is recognised as an essential source of postpartum care, with one Queensland study finding that 90% of Australian women see their GP within three months postpartum, regardless of whether their antenatal care was midwifery, GP or specialist led⁴. However, there remains a paucity of research pertaining to Australian GPs’ experience in postpartum care. There is also a specific lack of research on the experience of early-career GPs, including GPs in vocational training programs (in Australia, termed “registrars”). This vocational training is practice-based, with the majority of learning occurring in-practice⁵. As post-graduate experience in obstetrics and gynaecology (O&G) is not a prerequisite for training in the Royal College of Australian General Practitioners (RACGP)⁶, it is possible that some registrars may have little or no practical experience in postpartum care prior to entering their training. While the small proportion of registrars enrolled in the Australian College of Rural and Remote Medicine (ACRRM) are expected to complete substantive O&G training either prior to or during their fellowship this, again, is not a condition for training commencement. It therefore remains imperative that GP registrars receive adequate exposure to postpartum consultations during their Australian General Practice Training (AGPT) program, irrespective of the college of which they are enrolled.

Australian GPs are required to have skills to provide postpartum care regardless of the context in which they work¹. The World Health Organisation recommends a review of both mother and newborn at day 3, between days 7-10, and then again at approximately 6 weeks postpartum⁷. In Australia it is recommended that the timing of the postpartum visit be individualised to each women’s needs, however, in practice, the majority of postpartum check-ups are undertaken at 6 weeks⁸. It is recognised that both maternal and infant morbidity is increased in the first twelve months postpartum³. Pregnancy and family planning consultations account for 2.3% of GP consultations, with prenatal and postnatal checks together making up 0.6% of all total GP encounters⁹. The prevalence of all postpartum consultations, including routine checks, problem encounters and follow-up for GPs is not known.

RACGP registrars spend a minimum of 18-months of their clinical GP experience learning within an apprenticeship-like model of practice⁶, whereas ACRRM registrars may spend as little as 6 months in this setting. In this model registrars have considerable clinical independence but have recourse to advice and assistance from experienced supervisors⁵. They are expected to gain experience in postpartum care through consulting with patients

within this model. The Royal Australian College of General Practitioner's (RACGP's) curriculum expectations related to postpartum care include screening for depression, supporting breastfeeding, and detecting and managing postpartum complications and conditions of the mother and newborn¹. These curriculum expectations are mirrored in ACRRM's Primary Curriculum¹⁰. Learning objectives in relation to postpartum care are supported by the RACGP's Guidelines for preventative activities in general practice. However, these guidelines have been criticised as having a limited focus, and not providing a comprehensive approach to the mother-infant dyad¹¹. International guidelines also lack satisfactory clinical direction¹¹. In order for registrars to become knowledgeable and confident primary care specialists, the RACGP mandates training programs to provide "an appropriate number and variety of patients and case mix to ensure maximum training opportunities"⁶. This will include adequate postpartum care exposure.

The aim of this study was to establish the prevalence of GP registrars' postpartum consultations and the associations with practice, registrar, patient, and consultation factors.

Methods:

Setting: Australia General Practice Training (AGPT) program

AGPT involves three to four years of full-time equivalent practice, with a minimum of three 6-month terms (for RACGP registrars) in general practice. AGPT has been delivered in geographically-defined regions across Australia by Regional Training Providers (RTPs: 2001-2015) and Regional Training Organisations (RTOs: from 2016). The AGPT includes registrars from both Australian training colleges, the RACGP and ACRRM.

Setting: ReCEnT

This was a cross-sectional study employing data from the Registrar Clinical Encounters in Training (ReCEnT) project. ReCEnT is an ongoing cohort study of GP registrars' in-consultation clinical and educational experiences¹². Data has been collected across five of Australia's 17 RTPs (2010-2015) and three of nine RTOs (2016-2018). This analysis included data from 17 data collection rounds from 2010-2018.

ReCEnT is an integrated aspect of the registrars' training organisations' educational program, and registrars may optionally provide written consent for their data to be used for research purposes¹³. GP registrars provide information pertaining to their personal and

practice demographics. At approximately half-way through each GP term registrars record data of 60 consecutive office-based consultations. Sixty consultations equates to an average registrar working week.

Outcome variable

The outcome variable was a problem/diagnosis recorded by the registrar pertaining to postpartum care. Diagnoses or Problems in ReCEnT are coded according to the International Primary Care Classification (ICPC-2)¹⁴. See Appendix for complete list of inclusions of “postpartum diagnoses/problems”. The authors recognise that some groups view the mother and infant dyad as a single unit during the first three months of extra-uterine life¹⁵, however, this study focussed solely on maternal consultations.

Independent variables

The independent variables included registrar, practice, patient, consultation, clinical, and educational factors.

Registrar variables included; age, gender, training term, full-time or part-time status, country of primary medical degree, whether the registrar had worked at that practice previously, and obtainment of post-graduate qualifications in O&G (e.g. Certificate of Women’s Health, Diploma of Obstetrics).

Practice variables included; practice size, rurality status (postcode was used to determine the Australian Standard Geographical Classification Remoteness Area – ASGC-RA), socio-economic status (using the Socioeconomic Index of Area Index of Relative Socio-Economic Disadvantage), billing policy (whether wholly “bulk-billed”; i.e. at no cost to patient and covered wholly by the national public insurer, or not), and “Region” (RTP/RTO-based classification).

Patient variables; age, Aboriginal or Torres Strait Islander status, non-English speaking background (NESB), if the patient was new to the practice, and if the patient was new to the registrar.

Consultation variables; consultation duration, number of problems managed, whether problem was new, and if assistance was sought (e.g. supervisors, or specialist input, books or electronic resources).

Consultation outcome variables; referrals made, pathology or imaging ordered, follow-up requested, medication prescribed, or if learning goals were generated.

Ethical approval

The ReCEnT project has approval from the University of Newcastle Human Research Ethics Committee, Reference H-2009-0323.

Statistical Analysis

Statistical analysis was at the level of problem/diagnosis. The proportion of problems/diagnoses that were postpartum care was calculated with 95% CIs, adjusted for repeated measures within registrars. Statistical analyses used STATA 14.0 and SAS V9.4. Predictors were considered statistically significant if the p-value < 0.05.

For descriptive statistics, frequencies were used for categorical variables and the mean +/- standard deviation for continuous variables. Categorical variables were compared using Chi-squared tests (or Fisher's exact, as appropriate) and continuous variables were compared using t-tests.

Associations with "postpartum diagnoses/problems" were tested with sequential logistic regression models (see below) within the generalised estimating equations (GEE) framework to account for repeated measures within registrars. An exchangeable correlation structure was assumed.

Univariate analyses were conducted on each covariate, with covariates with a p-value < 0.20 considered for inclusion in the multiple regression model. All significant covariates were then fitted, and model reduction was assessed. If covariates were no longer significant (p<0.2) in the multivariable model then they were tested for removal. If the removal did not change the resultant model substantively (defined as a change in odds ratio of >10%) then it was removed from the final model. Analysis was carried out using STATA 14.0 and SAS V9.4.

In order to examine different aspects of our research question, three regression models were built.

To examine the question of associations of a registrar encountering a postpartum care problem/diagnosis patient, practice and registrar independent variables were entered in an initial logistic regression model.

To examine the question of how consultation content related to postpartum diagnoses/problems differs from that of other diagnoses/problems, the above variables were entered in a second model along with the "consultation variables".

To examine the question of whether actions arising from postpartum care problems/diagnoses differ from those arising from other problems/diagnoses, all variables

entered in the previous two models were entered in a third model along with “consultation outcome variables”.

The rationale for this sequential approach is that whether a patient presents with a postpartum problem/diagnosis will be influenced by patient, registrar, and practice factors, but evaluation of these influences may be distorted by inclusion in the multivariable model of factors operating once the consultation is progressing. Similarly, consideration of consultation content related to postpartum care may be distorted by the inclusion in this model of actions arising from the consultation.

Results:

The analysis included 2234 participating registrars, 4875 registrar-rounds (response rate was 96.1%), 289,594 consultations, and 453,786 problems/diagnoses. See Table 1 for participant registrar and practice demographics.

Postpartum problems/diagnoses (897) comprised 0.2%, [95% CI: 0.19-0.21] of all problems/diagnoses in 0.3% [95% CI: 0.27-0.31] of all consultations. See Table 2 for the most common postpartum problems/diagnoses. The characteristics associated with postpartum consultations and the univariate and multivariable logistic regression analyses are presented in Tables 3 and 4.

Significant multivariable associations of a problem/diagnosis being postpartum care included registrar's gender (female) and obtainment of post-graduate O&G qualifications. Patients were significantly more likely to be Aboriginal or Torres Strait Islander or NESB. Consultations containing postpartum care were longer in duration and involved a lower number of problems/diagnoses. Postpartum problems/diagnoses resulted in more learning goals being generated than non-postpartum care problems/diagnoses.

Discussion:

Main findings and comparison with previous literature

This was the first study to investigate Australian GP registrar exposure to postpartum care. Although there is no literature to enable direct comparisons with the prevalence of established Australian GPs' postpartum experience, the prevalence of consultations involving a postpartum problem/diagnosis appears quite modest – 0.2% of all problems/diagnoses seen.

On average, a postpartum problem/diagnosis is seen approximately every 5-6 weeks, which equates to approximately 14 occasions during a registrar's 18 months of core general practice training.

The strong association with registrar female gender is consistent with other findings from the ReCENT study relating to antenatal problems/diagnoses (Pappalardo et al, under review) and menopause-related diagnoses¹⁶. It is also consistent with the association of postpartum care and female gender in Australian established GPs¹⁷. Gender concordance is a recognised phenomenon in general practice and we have also previously established high prevalence of gender concordance of GP registrars and their patients¹⁸. Associations with gender concordance for GP registrars in our previous analysis included patient female gender, and reproductive/contraceptive/genital problems¹⁸.

The association of postpartum care with Aboriginal or Torres Strait Islander and NESB background was independent of socioeconomic status and rurality. It is possible that these patient groups' over-representation reflects less access to private obstetrics services. This has been demonstrated for South Australian Aboriginal and Torres Strait Islander women¹⁹ and Victorian NESB women²⁰. Aboriginal and Torres Strait Islander women are known to have higher rates of serious medical conditions in pregnancy, as well as pregnancy-induced diabetes, hypertension and poor infant outcomes¹⁹. This medical burden has not been correlated with higher engagement in GP primary care services in the postpartum period¹⁹ and therefore seems an unlikely explanation for the significant findings in our study.

Consultations including a postpartum problem/diagnosis were longer (mean duration of consultations 23 minutes versus 19 minutes) and had less additional problems managed. The duration of maternal postpartum consultations has been described as "longer than expected" by surveyed GPs with greater than one-quarter taking more than 25 minutes¹⁷. A contributing factor in the literature is opportunistic infant consults, which increase consultation times¹⁷. However, in our study registrars recorded one patient per encounter. The significant association with a reduced "number of problems" seen per consult, likely points to patients being seen for their initial, routine postpartum/postnatal check-up. The single-problem consult may also reflect the cultural expectation held by Australian GPs that all postpartum women should be seen in general practice whether or not they have physical or emotional problems¹⁷.

Strengths/Limitations

Strengths include the large number of consultations, high response rate²¹ and comprehensive geographic coverage (five of Australia's six states, and all classifications of rurality from major city to very remote). Thus, the findings have good generalisability to Australian GP vocational training and are likely to have generalisability to other apprenticeship-like practice-based GP training programs²².

A limitation is that, as the analyses are cross-sectional, association only (not causality) can be inferred. A further limitation is that the postpartum interval (time from delivery) cannot be ascertained from our data. Registrars' exposure could not be characterised as early versus late postpartum exposure.

Implications for education and future research

As noted, registrars' exposure to postpartum care seems limited. Furthermore, as there are strong associations with some registrar demographics, a conclusion is that some registrars will see considerably less postpartum presentations – notably male registrars (univariate OR for females 3.64), and those without post-graduate O&G qualifications (OR 2.07 for those with qualifications). Such O&G qualifications are not a pre-requisite for GP training and are only held by 7.3% of registrars in our study. This finding may suggest practice-level facilitation of GP registrars with an existing interest in women's health being preferentially scheduled patients who fit their existing interests/expertise. There was also an association of exposure with later training terms, again suggesting that registrars' experience may influence postpartum consultation scheduling.

Registrars were more likely to generate learning goals from the postpartum problem/diagnosis. However, there was no association with in-consultation information or assistance-seeking. This may suggest that although "check-up" consultations may be formulaic in their approach, and not require real-time resources, registrars still perceive learning needs and attribute educational value to these encounters. This is probably due to the overall low exposure to postpartum problems/diagnoses.

These findings (of overall prevalence, registrar demographic associations, and learning needs), taken together, have implications for GP training. They suggest likely deficits in training experience in postpartum care for many registrars (including male registrars) and that mechanisms at the practice level to facilitate postpartum care experience across the entire population of registrars is required.

Further research could assess GP registrar attitudes towards postpartum care, patient acceptability of male registrars, and the overall impact of prior learning and gender on postpartum care.

Conclusion

This was the first study to describe the exposure of Australian GP registrars to postpartum care. We established what is likely an overall low prevalence and that male registrars and those without pre-existing O&G expertise may have particularly limited experience before proceeding to independent post Fellowship practice. These findings should inform future learning interventions to increase opportunities in GP registrar training.

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Appendix:

Appendix 1. List of ICPC-2 Codes Included

W14	CONTRACEPTION FEMALE, OTHER	1	W			
7854	Contraception;postpartum	postpartum contraception	W14	20	A	
W17	POSTPARTUM BLEEDING	1	W			
4259	Bleeding;postpartum	postpartum bleeding	W17	1	A	
4786	Haemorrhage;postpartum	postpartum haemorrhage	W17	2	A	
4788	Haemorrhage;puerperal	puerperal haemorrhage	W17	3	A	
W18	POSTPARTUM SYMPTOM/COMPLAINT, OTHER	1	W			
490	Pain;postpartum	postpartum pain	W18	1	A	
		postpartum symptom or				
2195	Sympt/complaint;postpartum	complaint	W18	2	A	
2202	Complaint(s);postpartum	n/a	W18	3	I	W18002
W19	BREAST/LACTATION SYMPTOM/COMPLAINT	1	W			
3755	Unable (to);breastfeed	unable to breastfeed	W19	1	A	
4269	Blocked;milk duct	blocked milk duct	W19	2	A	
439	Pain;breast;lactating	breast pain while lactating	W19	3	A	

1382	Problem;breast feeding	breast feeding problem	W19	4	A	
		symptom or complaint of				
2070	Sympt/complaint;lactation	lactation	W19	5	A	
2092	Complaint(s);lactation	n/a	W19	6	I	W19005
5519	Weaning	weaning	W19	7	A	
5521	Galactorrhoea;lactation	galactorrhoea (lactation)	W19	8	A	
		requests suppression of				
5522	Lactation suppression;requests	lactation	W19	9	A	
5523	Disorder;lactation	lactation disorder	W19	10	A	
5649	Lactation;suppressed	suppressed lactation	W19	11	A	
5824	Lactation;failed	failed lactation	W19	12	A	
W20	Deleted, included with W19					
628	Problem;postpartum;breast	n/a	W20	1	I	W19013
1534	Engorged breast	n/a	W20	2	I	W19014
1533	Engorged breast;postpartum	n/a	W20	3	I	W19015
	MEDICAL EXAMIN/HEALTH EVAL PARTIAL					
W31	PREGNANCY		2	W		
4664	Exam;postnatal	postnatal examination	W31	1	A	
579	Check up;postnatal	postnatal check-up	W31	2	A	
594	Postnatal care	postnatal care	W31	3	A	
1993	Exam;postpartum	postpartum examination	W31	5	A	

5991	Check up;postpartum	postpartum check-up	W31	8	A	
REPAIR/FIX-SUTURE/CAST/PROSTH DEVICE						
W54	PREGNANCY		3	W		
841	Repair;episiotomy	episiotomy repair	W54	10	A	
3344	Repair;reproductive	repair (reproductive system)	W54	13	A	
3371	Fixate;reproductive	fixate (reproductive system)	W54	14	A	
5267	Repair;postpartum;perineal	postpartum perineal repair	W54	15	A	
5351	Repair;postpartum;vaginal	postpartum vaginal repair	W54	16	A	
5352	Repair;postpartum;anal	postpartum anal repair	W54	17	A	
5353	Repair;tear;first degree	repair of first degree tear	W54	18	A	
5354	Repair;tear;second degree	repair of second degree tear	W54	19	A	
5355	Repair;tear;third degree	repair of third degree tear	W54	20	A	
9626	Repair;tear;fourth degree	repair of fourth degree tear	W54	22	A	
THERAPEUTIC COUNSELLING/LISTENING						
W58	PREGNANCY		3	W		
5406	Counselling;genetic;postnatal	n/a	W58	10	I	A98002
REFERRAL TO OTHER PRIMARY HEALTH						
W66	PROVIDER PREGNANC		6	W		
9732	Referral;lactation support	referral for lactation support	W66	5	A	
W68	OTHER REFERRAL NEC PREGNANCY		6	W		
9711	Referral;postnatal support	referral for postnatal	W68	4	A	

		support			
W70	PUERPERAL INFECTION/SEPSIS		8	W	
677	Sepsis;puerperal	puerperal sepsis	W70	1	A
5789	Endometritis;puerperal	puerperal endometritis	W70	2	A
6334	Infection;puerperal	puerperal infection	W70	3	A
W90	UNCOMPLICATED LABOUR/DELIVERY, LIVEBIRTH		12	W	
		normal vaginal delivery of a			
4055	Delivery;normal vag;liveborn	liveborn	W90	1	A
W91	UNCOMPLICATED LABOUR/DELIVERY, STILLBIRTH		12	W	
		normal vaginal delivery of a			
279	Delivery;normal vag;stillbirth	stillborn	W91	2	A
		traumatic delivery of			
4067	Delivery;traumatic;liveborn(s)	liveborn(s)	W92	1	A
W92	COMPLICATED LABOUR/DELIVERY, LIVEBIRTH		12	W	
		traumatic delivery of			
4067	Delivery;traumatic;liveborn(s)	liveborn(s)	W92	1	A
9416	Tear;obstetric;first degree	first degree obstetric tear	W92	31	A
9417	Tear;obstetric;second degree	second degree obstetric tear	W92	32	A
9418	Tear;obstetric;third degree	third degree obstetric tear	W92	33	A
9625	Tear;obstetric;fourth degree	fourth degree obstetric tear	W92	34	A

2763	Retained placenta;liveborn(s)	retained placenta (liveborn)	W92	22	A	
90	Laceration;perineum (obstet)	obstetric perineal laceration	W92	8	A	
W93	COMPLICATED LABOUR/DELIVERY, STILLBIRTH	12	W			
2760	Retained placenta;stillbirth	retained placenta (stillbirth)	W93	12	A	
67	Mastitis;puerperalis	mastitis puerperalis	W94	1	A	
6343	Abscess;breast;puerperal	puerperal breast abscess	W94	2	A	
W94	PUERPERAL MASTITIS	12	W			
67	Mastitis;puerperalis	mastitis puerperalis	W94	1	A	
6343	Abscess;breast;puerperal	puerperal breast abscess	W94	2	A	
	BREAST DISORDER IN PREGNANCY/PUERPERIUM,					
W95	OTHER	12	W			
3999	Cracked;nipple;puerperal	puerperal cracked nipple	W95	1	A	
1495	Disorder;postpartum;breast	postpartum breast disorder	W95	5	A	
W96	COMPLICATIONS OF PUERPERIUM, OTHER	12	W			
1434	Complication;postnatal	postnatal complication	W96	1	A	
P71	ORGANIC PSYCHOSIS, OTHER	12	P			
701	Psychosis;puerperal	n/a	P71	3	I	P98008
678	Psychosis;postpartum	n/a	P71	4	I	P98009
P76	DEPRESSIVE DISORDER	12	P			
4053	Depression;postnatal	postnatal depression	P76	2	A	
699	Depression;puerperal	puerperal depression	P76	9	A	

P98 PSYCHOSIS NOS, OTHER		12 P		
6602	Psychosis;puerperal	puerperal psychosis	P98	8 A
6603	Psychosis;postpartum	postpartum psychosis	P98	9 A

Postpartum Appendix**Appendix 1. List of ICPC-2 Codes Included**

W14	CONTRACEPTION FEMALE, OTHER	1	W			
7854	Contraception;postpartum	postpartum contraception	W14	20	A	
W17	POSTPARTUM BLEEDING	1	W			
4259	Bleeding;postpartum	postpartum bleeding	W17	1	A	
4786	Haemorrhage;postpartum	postpartum haemorrhage	W17	2	A	
4788	Haemorrhage;puerperal	puerperal haemorrhage	W17	3	A	
W18	POSTPARTUM SYMPTOM/COMPLAINT, OTHER	1	W			
490	Pain;postpartum	postpartum pain	W18	1	A	
		postpartum symptom or				
2195	Sympt/complaint;postpartum	complaint	W18	2	A	
2202	Complaint(s);postpartum	n/a	W18	3	I	W18002
W19	BREAST/LACTATION SYMPTOM/COMPLAINT	1	W			
3755	Unable (to);breastfeed	unable to breastfeed	W19	1	A	
4269	Blocked;milk duct	blocked milk duct	W19	2	A	
439	Pain;breast;lactating	breast pain while lactating	W19	3	A	
1382	Problem;breast feeding	breast feeding problem	W19	4	A	
2070	Sympt/complaint;lactation	symptom or complaint of	W19	5	A	

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		lactation				
2092	Complaint(s);lactation	n/a	W19	6	I	W19005
5519	Weaning	weaning	W19	7	A	
5521	Galactorrhoea;lactation	galactorrhoea (lactation)	W19	8	A	
		requests suppression of				
5522	Lactation suppression;requests	lactation	W19	9	A	
5523	Disorder;lactation	lactation disorder	W19	10	A	
5649	Lactation;suppressed	suppressed lactation	W19	11	A	
5824	Lactation;failed	failed lactation	W19	12	A	
W20	Deleted, included with W19					
628	Problem;postpartum;breast	n/a	W20	1	I	W19013
1534	Engorged breast	n/a	W20	2	I	W19014
1533	Engorged breast;postpartum	n/a	W20	3	I	W19015
	MEDICAL EXAMIN/HEALTH EVAL PARTIAL					
W31	PREGNANCY		2	W		
4664	Exam;postnatal	postnatal examination	W31	1	A	
579	Check up;postnatal	postnatal check-up	W31	2	A	
594	Postnatal care	postnatal care	W31	3	A	
1993	Exam;postpartum	postpartum examination	W31	5	A	
5991	Check up;postpartum	postpartum check-up	W31	8	A	
W54	REPAIR/FIX-SUTURE/CAST/PROSTH DEVICE		3	W		

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PREGNANCY					
841	Repair;episiotomy	episiotomy repair	W54	10	A
3344	Repair;reproductive	repair (reproductive system)	W54	13	A
3371	Fixate;reproductive	fixate (reproductive system)	W54	14	A
5267	Repair;postpartum;perineal	postpartum perineal repair	W54	15	A
5351	Repair;postpartum;vaginal	postpartum vaginal repair	W54	16	A
5352	Repair;postpartum;anal	postpartum anal repair	W54	17	A
5353	Repair;tear;first degree	repair of first degree tear	W54	18	A
5354	Repair;tear;second degree	repair of second degree tear	W54	19	A
5355	Repair;tear;third degree	repair of third degree tear	W54	20	A
9626	Repair;tear;fourth degree	repair of fourth degree tear	W54	22	A
THERAPEUTIC COUNSELLING/LISTENING					
W58	PREGNANCY		3	W	
5406	Counselling;genetic;postnatal	n/a	W58	10	I A98002
REFERRAL TO OTHER PRIMARY HEALTH					
W66	PROVIDER PREGNANC		6	W	
9732	Referral;lactation support	referral for lactation support	W66	5	A
W68	OTHER REFERRAL NEC PREGNANCY		6	W	
9711	Referral;postnatal support	referral for postnatal support	W68	4	A
W70	PUERPERAL INFECTION/SEPSIS		8	W	

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677	Sepsis;puerperal	puerperal sepsis	W70	1	A
5789	Endometritis;puerperal	puerperal endometritis	W70	2	A
6334	Infection;puerperal	puerperal infection	W70	3	A
W90	UNCOMPLICATED LABOUR/DELIVERY, LIVEBIRTH		12	W	
		normal vaginal delivery of a			
4055	Delivery;normal vag;liveborn	liveborn	W90	1	A
W91	UNCOMPLICATED LABOUR/DELIVERY, STILLBIRTH		12	W	
		normal vaginal delivery of a			
279	Delivery;normal vag;stillbirth	stillborn	W91	2	A
		traumatic delivery of			
4067	Delivery;traumatic;liveborn(s)	liveborn(s)	W92	1	A
W92	COMPLICATED LABOUR/DELIVERY, LIVEBIRTH		12	W	
		traumatic delivery of			
4067	Delivery;traumatic;liveborn(s)	liveborn(s)	W92	1	A
9416	Tear;obstetric;first degree	first degree obstetric tear	W92	31	A
9417	Tear;obstetric;second degree	second degree obstetric tear	W92	32	A
9418	Tear;obstetric;third degree	third degree obstetric tear	W92	33	A
9625	Tear;obstetric;fourth degree	fourth degree obstetric tear	W92	34	A
2763	Retained placenta;liveborn(s)	retained placenta (liveborn)	W92	22	A
90	Laceration;perineum (obstet)	obstetric perineal laceration	W92	8	A

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W93	COMPLICATED LABOUR/DELIVERY, STILLBIRTH	12	W		
2760	Retained placenta;stillbirth	retained placenta (stillbirth)	W93	12	A
67	Mastitis;puerperalis	mastitis puerperalis	W94	1	A
6343	Abscess;breast;puerperal	puerperal breast abscess	W94	2	A
W94	PUERPERAL MASTITIS	12	W		
67	Mastitis;puerperalis	mastitis puerperalis	W94	1	A
6343	Abscess;breast;puerperal	puerperal breast abscess	W94	2	A
	BREAST DISORDER IN PREGNANCY/PUERPERIUM,				
W95	OTHER	12	W		
3999	Cracked;nipple;puerperal	puerperal cracked nipple	W95	1	A
1495	Disorder;postpartum;breast	postpartum breast disorder	W95	5	A
W96	COMPLICATIONS OF PUERPERIUM, OTHER	12	W		
1434	Complication;postnatal	postnatal complication	W96	1	A
P71	ORGANIC PSYCHOSIS, OTHER	12	P		
701	Psychosis;puerperal	n/a	P71	3	I P98008
678	Psychosis;postpartum	n/a	P71	4	I P98009
P76	DEPRESSIVE DISORDER	12	P		
4053	Depression;postnatal	postnatal depression	P76	2	A
699	Depression;puerperal	puerperal depression	P76	9	A
P98	PSYCHOSIS NOS, OTHER	12	P		
6602	Psychosis;puerperal	puerperal psychosis	P98	8	A

6603	Psychosis;postpartum	postpartum psychosis	P98	9	A
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Tables**i. Table 1: Demographics of participating registrars and their practices**

Registrar characteristics (n=2234)		n (%)
Registrar gender	Male	839 (37.6)
	Female	1395 (62.4)
Qualified as doctor in Australia	Yes	1813 (81.6)
	No	408 (18.4)
Enrolled College	RACGP	2079 (97)
	ACRRM	34 (2)
	Both	25 (1)
Have post-graduate qualification in obstetrics and gynaecology	Yes	162 (7.3)
Registrar-round characteristics (n=4875)		
Registrar works full-time	Yes	1059 (22.4)
	No	3665 (77.6)
Age (years)	Mean $\pm$ SD	32.4 $\pm$ 6.2
Term	Term 1	2108 (43.2)
	Term 2	1545 (31.7)
	Term 3	1222 (25.1)
Registrar worked at practice previously	Yes	1072 (22.3)
	No	3739 (77.7)
Practice routinely bulk bills	Yes	1214 (25.2)
	No	3604 (74.8)
No. GPs working at the practice	1-4	1762 (37.4))
	5-10+	2950 (62.6)
Rurality	Major city (1)	2958 (60.8)

Registrar characteristics (n=2234)	n (%)
Inner regional (2)	1232 (25.3)
Outer regional remote (3-5)	679 (14.0)
SEIFA [†] index	Mean $\pm$ SD 5.5 $\pm$ 2.8

[†]Socioeconomic Index for Area Index of Relative Disadvantage

Postpartum Tables**ii. Table 2: Frequency of most common postpartum problems/diagnoses**

Postpartum Problem (n=897)	Frequency	Percent
Routine Check up	456	50.83
Mental health	199	22.18
Breast problem/Lactation	161	17.95
Placental/Bleeding	31	3.45
Postpartum symptom/problem	18	2.01
Contraception	11	1.23
Perineal trauma	11	1.23

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Postpartum Tables**iii. Table 3: Factors associated with postpartum problems/diagnoses – univariate analysis**

Factor group	Variable	Class	No	Yes	p
Patient factors	Patient age group	0-19	85607 (19%)	35 (4%)	<0.001
		20-29	63388 (14%)	358 (41%)	
		30-39	59792 (13%)	438 (50%)	
		40+	237062 (53%)	42 (5%)	
	Aboriginal or Torres Strait Islander	No	416368 (98%)	810 (96%)	<0.001
		Yes	7245 (2%)	32 (4%)	
	NESB [‡]	No	390888 (92%)	752 (89%)	0.0049
		Yes	35770 (8%)	94 (11%)	
	Patient/practice status	Existing patient	186531 (42%)	393 (45%)	<0.001
		New to registrar	223808 (51%)	380 (43%)	
		New to practice	32271 (7%)	105 (12%)	
Registrar factors	Registrar gender	Male	161495 (36%)	120 (13%)	<0.001
		Female	291394 (64%)	777 (87%)	
	Registrar FT or PT	Part-time	100619 (23%)	251 (29%)	0.0011
		Full-time	338781 (77%)	619 (71%)	
	Term	Term 1	199278 (44%)	332 (37%)	0.0011
		Term 2	141422 (31%)	316 (35%)	

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Factor group	Variable	Class	No	Yes	p
Practice factors	Worked at practice previously	Term 3	112189 (25%)	249 (28%)	0.0041
		No	345994 (77%)	643 (73%)	
	Qualified as doctor in Australia	Yes	101029 (23%)	241 (27%)	0.11
		No	76788 (17%)	129 (14%)	
	Post-graduate Obstetric/ gynaecology qualifications	Yes	373721 (83%)	763 (86%)	<0.001
		No	417987 (92%)	765 (85%)	
	Registrar age	mean (SD)	32 (6)	32 (6)	0.11
	Practice size	Small (<6 GPs)	166296 (38%)	295 (34%)	0.08
		Large (6+ GPs)	271986 (62%)	564 (66%)	
	Practice routinely bulk bills	No	335594 (75%)	660 (74%)	0.58
		Yes	112414 (25%)	226 (26%)	
	Rurality	Major city	273175 (60%)	544 (61%)	0.04
		Inner regional	114794 (25%)	251 (28%)	
		Outer regional/ remote/ very remote	64470 (14%)	102 (11%)	
	Region	Region 1	112807 (25%)	252 (28%)	0.15
		Region 2	36129 (8%)	67 (7%)	
		Region 3	55136 (12%)	127 (14%)	
		Region 4	168656 (37%)	314 (35%)	

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Factor group	Variable	Class	No	Yes	p
Consultation factors		Region 5	10390 (2%)	22 (2%)	
		Region 6	55377 (12%)	85 (9%)	
		Region 7	14394 (3%)	30 (3%)	
	SEIFA† index decile	mean (SD)	5 (3)	5 (3)	0.69
	New problem seen	No	183793 (44%)	222 (26%)	<0.001
		Yes	230592 (56%)	626 (74%)	
	Sought help any source	No	375496 (83%)	729 (81%)	0.16
		Yes	77393 (17%)	168 (19%)	
	Consultation duration (minutes)	mean (SD)	19 (10)	23 (10)	<0.001
	Number of problems	mean (SD)	2 (1)	2 (1)	<0.001
Consultation outcome factors	Imaging ordered	No	418097 (92%)	873 (97%)	<0.001
		Yes	34792 (8%)	24 (3%)	
	Pathology ordered	No	375672 (83%)	768 (86%)	0.02
		Yes	77217 (17%)	129 (14%)	
	Learning goals generated	No	352759 (82%)	629 (74%)	<0.001
		Yes	75438 (18%)	223 (26%)	
	Follow-up ordered	No	254562 (56%)	469 (52%)	0.02
		Yes	198327 (44%)	428 (48%)	
	Referral ordered	No	396932 (88%)	775 (86%)	0.34
		Yes	55957 (12%)	122 (14%)	

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Factor group	Variable	Class	No	Yes	p
	Medication prescribed	No	255516 (56%)	613 (68%)	<0.001
		Yes	197373 (44%)	284 (32%)	

†Socioeconomic Index for Area Index of Relative Disadvantage

‡ Non-English Speaking Background

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Postpartum Tables**iv. Table 4: Factors associated with postpartum problems/diagnoses – multivariable analysis**

Model	Factor group	Variable	Class	Univariate		Adjusted	
				OR (95% CI)	p	OR (95% CI)	p
Model i	Patient factors	Aboriginal or Torres Strait Islander	Yes	2.28 (1.50, 3.47)	<0.001	1.97 (1.27, 3.05)	0.002
		NESB†	Yes	1.41 (1.11, 1.80)	0.005	1.30 (1.01, 1.68)	0.04
		Patient age group	0-19	0.07 (0.05, 0.10)	<0.001	0.07 (0.05, 0.10)	<0.001
		Referent: 20-29	30-39	1.29 (1.11, 1.51)	<0.001	1.32 (1.12, 1.55)	<0.001
			40+	0.03 (0.02, 0.04)	<0.001	0.03 (0.02, 0.04)	<0.001
		Patient/practice status	New to practice	1.54 (1.22, 1.94)	<0.001	1.16 (0.91, 1.47)	0.24
		Referent: existing patient	New to registrar	0.82 (0.70, 0.95)	0.011	0.87 (0.74, 1.02)	0.09
	Registrar factors	Qualified as doctor in Australia	Yes	1.21 (0.96, 1.51)	0.11	1.28 (0.98, 1.67)	0.07
		Post-graduate O&G qualifications	Yes	2.07 (1.65, 2.59)	<0.001	1.64 (1.31, 2.06)	<0.001
		Registrar age		0.99 (0.98, 1.00)	0.11	1.00 (0.99, 1.02)	0.58
		Registrar gender	Female	3.64 (2.94, 4.51)	<0.001	2.91 (2.31, 3.67)	<0.001
		Term	Term 2	1.34 (1.13, 1.59)	0.001	1.27 (1.03, 1.55)	0.02

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Model	Factor group	Variable	Class	Univariate		Adjusted	
				OR (95% CI)	p	OR (95% CI)	p
	Practice factors	Referent: Term 1	Term 3	1.33 (1.11, 1.59)	0.002	1.28 (1.05, 1.57)	0.01
		Worked at practice previously	Yes	1.28 (1.08, 1.52)	0.004	1.20 (0.98, 1.46)	0.07
		Region	Region 2	0.81 (0.58, 1.14)	0.23	0.80 (0.56, 1.15)	0.23
		Referent: Region 1	Region 3	1.02 (0.80, 1.30)	0.85	0.97 (0.73, 1.28)	0.83
			Region 4	0.84 (0.69, 1.03)	0.09	0.77 (0.61, 0.97)	0.03
			Region 5	0.96 (0.59, 1.57)	0.87	0.79 (0.42, 1.50)	0.47
			Region 6	0.68 (0.50, 0.92)	0.01	0.51 (0.35, 0.73)	<0.001
			Region 7	0.94 (0.63, 1.41)	0.77	1.44 (0.93, 2.23)	0.10
		Rurality	Inner regional	1.08 (0.91, 1.29)	0.37	1.09 (0.85, 1.41)	0.50
	Consultation factors	Referent: Major City	Outer regional/ remote/very remote	0.77 (0.60, 0.99)	0.04	0.96 (0.70, 1.31)	0.78
		Consultation duration (minutes)		1.03 (1.02, 1.03)	<0.001	1.03 (1.03, 1.04)	<0.001
		New problem seen	Yes	2.27 (1.93, 2.67)	<0.001	2.01 (1.68, 2.40)	<0.001

GP registrar experience in postpartum care

Model	Factor group	Variable	Class	Univariate		Adjusted	
				OR (95% CI)	p	OR (95% CI)	p
		Number of problems		0.87 (0.81, 0.94)	<0.001	0.80 (0.73, 0.89)	<0.001
Model iii	Consultation outcome factors	Imaging ordered	Yes	0.32 (0.21, 0.50)	<0.001	0.24 (0.15, 0.38)	<0.001
		Learning goals generated	Yes	1.70 (1.44, 2.00)	<0.001	1.75 (1.43, 2.14)	<0.001
		Medication prescribed	Yes	0.60 (0.52, 0.70)	<0.001	0.59 (0.50, 0.70)	<0.001
		Pathology ordered	Yes	0.80 (0.66, 0.97)	0.02	0.46 (0.37, 0.58)	<0.001

† Non-English Speaking Background

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