Clinical Report '07

the women's
the royal women's hospital

The Research Report provides information about research undertaken at the Women's, opportunities for research training and how the research relates to clinical practice.

The Clinical Report provides information for peer hospitals and professional groups on clinical activities at the Women's and is written to encourage critical reflection, accountability and peer commentary on our clinical performance.

The Quality of Care Report provides information for the public about the quality and safety of clinical care, how we compare with other hospitals and how we seek to improve care.

Welcome to the Clinical Report

Welcome to the 2007 Clinical Report. The report describes the clinical activities of the Royal Women's Hospital, Melbourne, during the period 1999-2006.

A clinical report was last published by the Women's in 1998. It has been our aim for a couple of years now to bridge the gap between 1998 and 2006. The report builds on material in previous reports and adds perspectives to the changes that have occurred in clinical care over this time.

The Women's is Australia's largest specialist hospital dedicated to improving the health of women and newborn babies. Each year, we care for more than 200,000 women from 165 countries, who speak 60 different languages and follow 38 separate religious faiths. The Women's is a major teaching hospital with academic affiliations to the University of Melbourne and La Trobe University. It is a key state provider of training programs for obstetricians, gynaecologists, neonatologists, nurses, midwives and allied health professionals.

The Women's is committed to a holistic philosophy of health care and provides comprehensive services ranging from health promotion to clinical expertise and leadership in maternity care, gynaecology, cancer services, mental health and specialist care of newborn babies.

For 150 years, the Women's has led the advocacy and advancement of women's health care. Established in 1856 as 'The Melbourne Lying-In Hospital and Infirmary for Diseases of Women and Children', our hospital began as a place where 'under-privileged women' could give birth to their babies and receive medical attention and nursing. Today, our social model of care recognises that factors such as housing, income and stress affect women's ability to care for themselves and their families.

This Clinical Report is part of a suite of reports, including the Quality of Care Report which reports to our community on our quality of care, the Research Report and our Annual Report.

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Medical Advisor to the Chief Executive

Associate Professor Leslie Reti
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The Clinical Report was made possible by the efforts of numerous clinicians and other staff of the hospital, who provided data, commentary and review. The particular efforts of Health Information Services and the Clinical Practice Improvement Unit in providing data are acknowledged, along with others who provided data from locally maintained databases.

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Introduction to the Report

Purpose of the Report

The Clinical Report provides an opportunity to reflect on the clinical work of the hospital and to provide an account that allows for peer comment. It is an important component of clinical governance that the Women's gives a public account of its clinical performance and the opportunity for internal reflection and ongoing improvement in clinical practice.

Data Sources

The report contains figures, tables and commentary. The Clinical Report necessarily relies on the data available to it. The various data sources are listed below and fall into two categories, administrative data and purpose designed clinical databases. Data sources are indicated for each table. Administrative databases used are Victorian Admitted Episodes Dataset (VAED), Victorian Emergency Minimum Dataset (VEMD), Elective Surgery Information System (ESIS) and Victorian Ambulatory and Funding System (VACS). The VAED collects morbidity data using ICD10-AM as the clinical coding classification.

Clinical databases used include the ROBIN maternity database, the HASS theatre database, the Cartwright neonatal database, the OnDysplay dysplasia database and the GeMMA oncology database. Perinatal mortality data from 2004 is taken from the Perinatal Mortality database, which supports the work of the Perinatal Mortality Review Committee, and prior to 2004, the Victorian Perinatal Data Collection Unit.

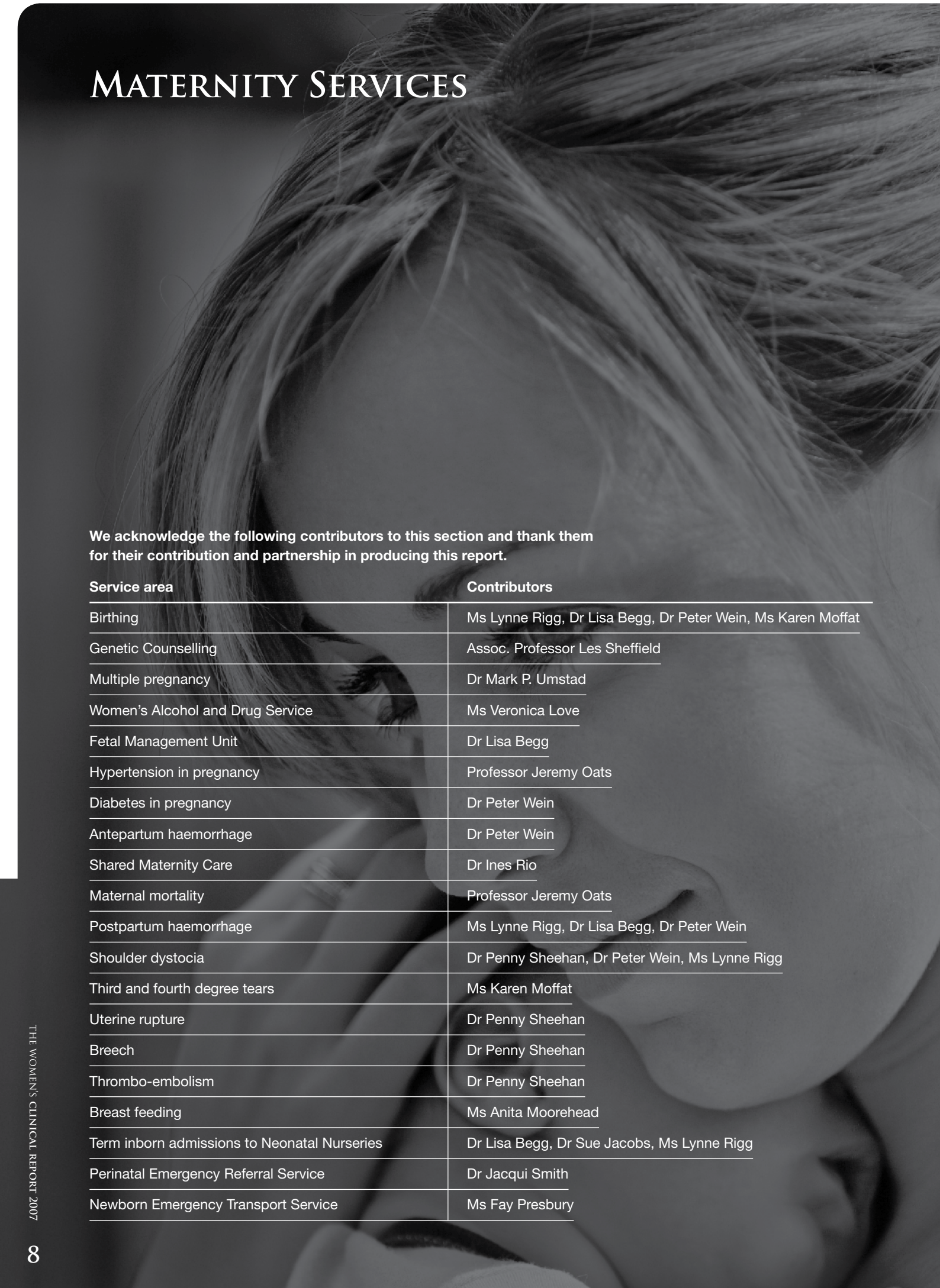
Data Quality

There are limitations in some of the datasets and data availability and these affect the data available for the report. The rule that datasets are as good as the information that goes into them applies. Some of the databases have higher standards of validation of the data and clinical detail. Data that is used for ongoing reflection on clinical practice tends to improve as there is more investment in ensuring that good data goes into the database. We have drawn from different databases according to their strengths. Most data is reported in calendar years.

There are standard differences between some of the databases, for example, between VAED and ROBIN. VAED codes on the day of discharge, whereas ROBIN codes on the day of birth. This means that annual totals of babies born and women giving birth will have small differences arising from when within the episode of care the data is recorded or coded. This will be apparent in different tables within the maternity chapter, depending whether their source is ROBIN or VAED. Where differences exist, we have sought to ensure that they can be explained and tables will indicate this, for example, anaesthetics data includes after hours patients from a collocated private hospital. In maternity, work has been done by the Clinical Practice Improvement Unit and Health Information Services to validate some of the morbidity data between the two datasets. Where there have been projects by the Clinical Practice Improvement Unit to improve maternity care, the data is more reliable.

Preparation of this report has highlighted the limitations of current data systems. The introduction of electronic data and record systems will be an important step in improving the quality of the data collected and available for analysis in later reports. Furthermore the practice of reviewing the output of current databases tends to improve the quality of clinical input.

Maternity Services



We acknowledge the following contributors to this section and thank them for their contribution and partnership in producing this report.

Service area	Contributors
Birthing	Ms Lynne Rigg, Dr Lisa Begg, Dr Peter Wein, Ms Karen Moffat
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Maternity Services

The eight years covered by this Clinical Report have posed a number of challenges for the providers and recipients of the maternity care provided by the Women's.

After the initial expected and predicted fall in the birth numbers from 1999 to 2002, the Women's in company with the other major providers of maternity services in Victoria and throughout Australia have experienced an unpredicted (20%) increase in the birth numbers over the past 5 years. This increase has been accompanied by a disproportionate increase in the complexity of the pregnancies. A number of factors including increasing maternal age, obesity, multiple pregnancies, medical conditions such as diabetes and the hypertensive disorders have contributed to the rise in complexity. The expectations of women and their families are also increasing and these factors all contribute to greater demands on the time and expertise of the health care team. It is reassuring that this demand has not been accompanied by a reduction in the quality of care and of the maternal and paediatric outcomes – a tribute to the dedication and skills of all the maternity services staff of the hospital.

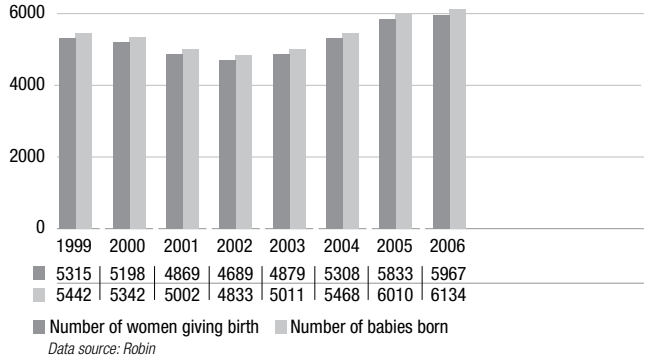
Most of the data presented has been derived from ROBIN, and where this is not available, from VAED. It should be noted that where the term 'deliveries' is used, this refers to women giving birth. Preparation of this report has highlighted the limitations of the current maternity data systems used in the hospital and the introduction of an electronic data and record system will bring major benefits not only in the quality of the data collected but even more importantly for the provision of high standards of care.

Professor Jeremy Oats, Clinical Director, Women's Services
Ms Tanya Farrell, Director, Maternity Services

Birthing

During the past five years, there has been a 20 per cent increase in demand for maternity services at the Women's.

Figure 1: Birthing summary (calendar years)



The figures below are financial year data (other data in this chapter are calendar year) and show year by year maternity demand increases over 10 years. The data up to 1998 includes Frances Perry House, which became a separate private hospital in March 1998. Current public maternity demand is at the level of the combined public and private births of the late 1990s.

Figure 2: Time series for total number of births and women giving birth (financial years)

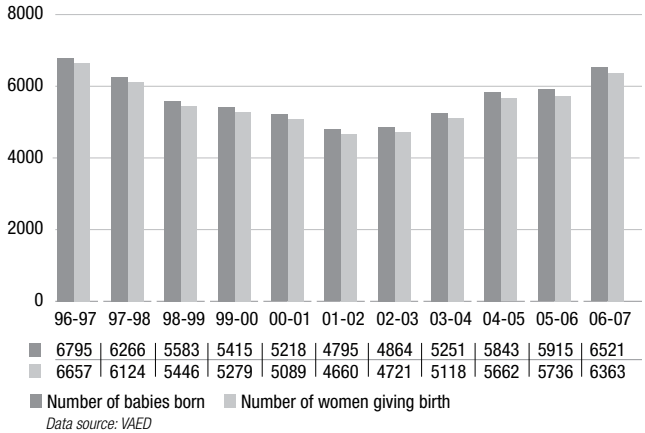


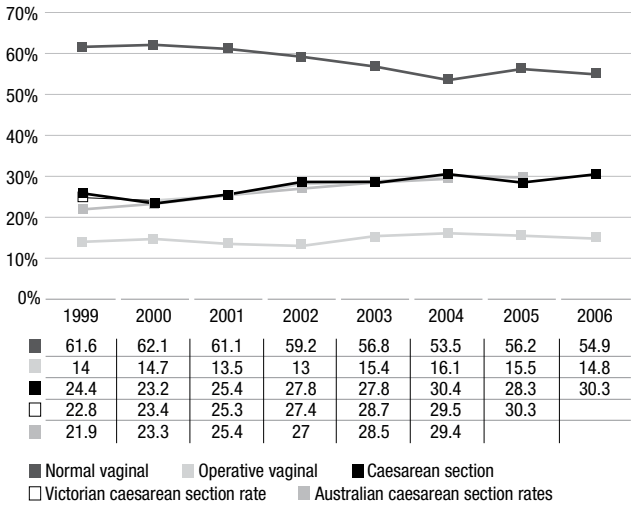
Table 1: Proportional changes and average per day 1996-2007 (financial years)

	1996-97	1997-98	1998-99	1999-00	2000-01	2001-02	2002-03	2003-04	2004-05	2005-06	2006-07
Proportional change Numbers of women giving birth		-8.01%	-11.07%	-3.07%	-3.60%	-8.43%	1.31%	8.41%	10.63%	1.31%	10.93%
Average no of women giving birth per day	18	17	15	14	14	13	13	14	16	16	17

Data source: VAED

Mode of birth

Figure 3: Mode of birth



Data source: Perinatal Data Collection Unit; National Perinatal Statistics Unit

The rate of normal vaginal births has decreased. The rate of caesarean section is 25 percent higher than in 1999, although it has remained steady overall. In 2006, 30.3% of women had a caesarean section. The increase in caesarean sections is almost entirely attributable to an increase in emergency procedures.

For operative vaginal birth, there has been a switch between the relative contributions of forceps and vacuum extraction, in line with international trends. The proportion of vaginal breech births has decreased since the publication of the Term Breech Trial[1].

Table 2: Mode of birth summary

	1999		2000		2001		2002		2003		2004		2005		2006	
	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%
Normal vaginal	3275	61.6	3226	62.1	2975	61.1	2776	59.2	2771	56.8	2841	53.5	3277	56.2	3277	54.9
Forceps	413	7.8	416	8.0	299.0	6.1	224	4.8	294	6.0	304	5.7	334	5.7	284	4.8
Vacuum extraction	256	4.8	283	5.4	302	6.2	337	7.2	390	8.0	499	9.4	531	9.1	540	9.0
Breech vaginal birth	74	1.4	65	1.3	55	1.1	49	1.0	67	1.4	49	0.9	40	0.7	60	1.0
Total operative vaginal	743	14.0	764	14.7	656	13.5	610	13.0	751	15.4	852	16.1	905	15.5	884	14.8
Emergency caesarean section	803	15.1	743	14.3	752	15.4	819	17.5	876	18.0	1054	19.9	1059	18.2	1199	20.1
Elective caesarean section	494	9.3	465	8.9	486	10.0	484	10.3	481	9.9	561	10.6	592	10.1	607	10.2
Total caesarean section	1297	24.4	1208	23.2	1238	25.4	1303	27.8	1357	27.8	1615	30.4	1651	28.3	1806	30.3

Data source: ROBIN

Table 3: State and National data for caesarean section (including private hospitals)

	1999	2000	2001	2002	2003	2004	2005	2006
Victorian caesarean section rate* (%)	22.8	23.4	25.3	27.4	28.7	29.5	30.3	NA
Australian caesarean section rate** (%)	21.9	23.3	25.4	27.0	28.5	29.4	NA	NA

Data source: Perinatal Data Collection Unit; National Perinatal Statistics Unit***

[1] *Hannah, M.A.; Hannah, W.J.; Hewson, S.A.; Hodnett, E.D.; Saigal, S.; Willan, A.R. (2000, October 21) Planned caesarean section versus planned vaginal birth for breech presentation at term: a randomized multicentre trial. The Lancet. Vol. 356. Issue 9239. pp. 1375-1383*

The Women's is responsible for approximately ten percent of the women giving birth in Victoria. As a tertiary referral centre with a higher risk profile, the caesarean section rate is similar to the state and national rates.

To understand the characteristics of women having caesarean births at the Women's we have applied the Robson Ten Group Classification System[2], which assists in the identification of the main contributors to the caesarean section rate. Through identification of the key groups of women who are having caesarean sections, we are able to focus our efforts to create practice change.

The analysis of this data demonstrates that if the caesarean section rates are to be reduced, the focus should be on the care of women in Groups 1, 2 and 5. As shown, most of the increase has been in emergency caesarean sections, so there is more to be gained in Groups 1 and 2. Group 2 comprises nulliparous women having labour induced. However, it may not be that induction of labour (IOL) by itself increases the risk of caesarean section. For example, the indication for the induction may be the underlying contributor to the caesarean section rather than the actual IOL itself. Most randomised studies of induction of labour compared with awaiting spontaneous labour do not show any difference in caesarean section rates with induction of labour.

Group 5 includes all women who have had one or more previous caesarean sections. This is a large group, and the group has a high caesarean section rate. An effective strategy for reducing the overall caesarean section rate at the hospital is to reduce both the size of this group (by increasing the number of women giving birth vaginally) and reduce the caesarean section rate for this group.

Table 4: Deliveries classified into the Robson Ten Group Classification System calendar year 2006

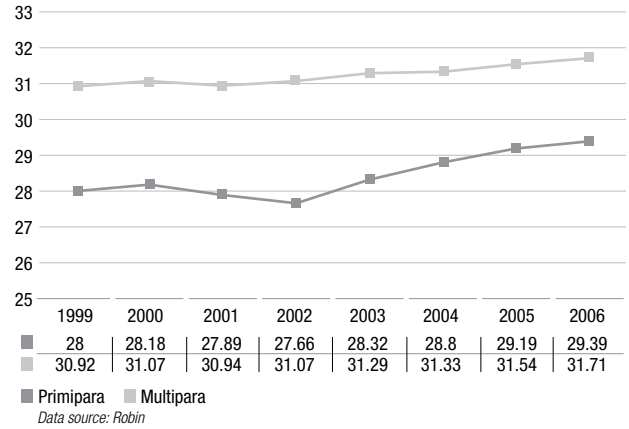
Group characteristics	No. of women in group (%) of all women	Normal vaginal (%) of women in each group	Operative vaginal (%) of women in each group	Elective C/S (%) of women in each group	Emergency C/S (%) of women in each group
1. Women who had no previous live births and no previous stillbirths, are having a singleton pregnancy with cephalic presentation, have a gestation of 37 wks or more, and enter labour spontaneously.	1598 (27%)	884 (55%)	435 (27%)	0	279 (17.5%)
2. Women who had no previous live births and no previous stillbirths, are having a singleton pregnancy with cephalic presentation, have a gestation of 37 wks or more, and do not enter labour spontaneously (or have no labour).	877 (15%)	269 (31%)	211 (24%)	63 (7%)	335 (38%)
3. Women who have previously had one or more live or still births (but no previous C/S), are having a singleton pregnancy with cephalic presentation, have a gestation of 37 wks or more, and enter labour spontaneously.	1501 (25%)	1348 (90%)	70 (5%)	0 (0%)	83 (5.5%)
4. Women who have previously had one or more live or still births (but no previous C/S), are having a singleton pregnancy with cephalic presentation, have a gestation of 37 wks or more, and do not enter labour spontaneously (or have no labour).	461 (8%)	374 (81%)	26 (6%)	25 (5%)	35 (8%)
5. Women who have had a previous C/S, and are having a singleton pregnancy with cephalic presentation with a gestation of 37 wks or more.	609 (10%)	102 (17%)	28 (5%)	343 (56%)	136 (22%)
6. Women who have had no previous live births and no previous stillbirths, and are having a singleton pregnancy with a breech presentation.	161 (3%)	0	27 (17%)	57 (35%)	77 (48%)
7. Women who have had one or more previous live or still births, and are having a singleton pregnancy with a breech presentation.	116 (2%)	0	30 (26%)	43 (37%)	43 (37%)
8. Women who are having a multiple pregnancy.	162 (3%)	31 (19%)	21 (13%)	49 (30%)	61 (38%)
9. Women who are having a baby with a presentation other than breech or cephalic (e.g. brow, shoulder, face).	17 (0.3%)	0	0	2 (12%)	15 (88%)
10. Women who are having a singleton pregnancy with a cephalic presentation, and a gestation less than 37 wks.	465 (8%)	269 (58%)	36 (8%)	23 (5%)	137 (29.5%)

Data source: ROBIN

[2] *Robson MS (2001) Can we reduce the caesarean section rate? Best Practice & Research Clinical Obstetrics and Gynaecology 15 (1): 179-194*

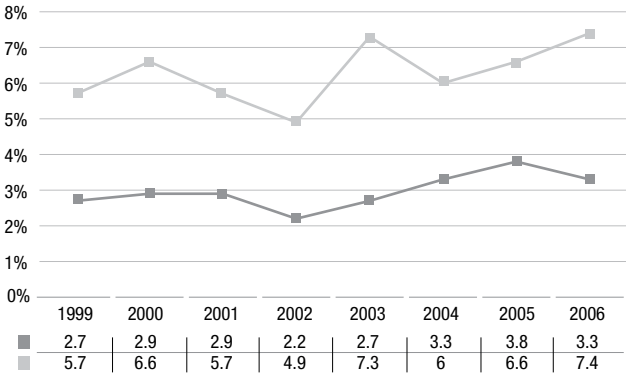
Mode of birth by age

Figure 4: Mean age by parity



Data source: Robin

Figure 5: Rate of primiparas and multiparas aged 40 years or more



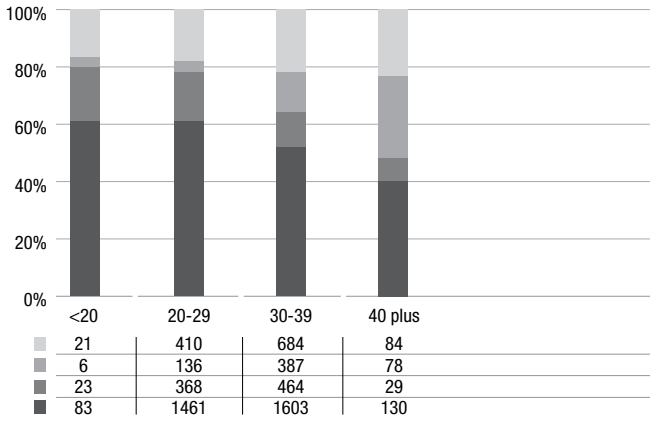
Data source: Robin

The mean age of both primiparas and multiparas has been increasing since 2002. As maternal age is an independent predictor of caesarean section, this partially accounts for the increase in caesarean sections.

There has been a steady increase in the proportion of women (who are aged 40 years and over) having babies. Aside from the impact on caesarean sections mentioned above, these women are more likely to have medical conditions such as diabetes and hypertension complicating pregnancy, as well as a higher risk of congenital abnormalities, perinatal and maternal mortality.

The Robson framework does not include age. Analysis by maternal age shows that the caesarean section rate increases with maternal age. Fifty percent (50%) of women in the 40 plus age group gave birth by caesarean section in 2006.

Figure 6: Mode of birth by maternal age 2006



Data source: Robin

Vaginal Birth after Caesarean Section (VBAC)

In 2006, 2996 multiparas gave birth at the Women's. Of these, 578 women had previously had one caesarean section. Vaginal Birth after Caesarean Section (VBAC) should be considered as an option for this cohort of women.

In 2006, 270 (47%) women who had one previous caesarean section had an elective caesarean section and 257 (44%) entered labour spontaneously and 132 of these (51%) gave birth vaginally. The remainder had repeat caesarean sections. This outcome aligns with data in both Victoria's Maternity Performance Indicator Report[3] and Women's Hospitals Australasia (WHA) Report[4].

Table 5: Mode of delivery of women with previous caesarean section in 2006

	n	%
Women with one previous caesarean section	578	
Normal vaginal deliveries (women giving birth)	118	20
Operative vaginal deliveries	33	6
Emergency caesarean section	157	27
Elective caesarean section	270	47
Total caesarean section	427	74

Data source: ROBIN

Table 6: Mode of delivery of women with previous caesarean section, who enter labour spontaneously in 2006

	n	%
Women with one previous caesarean section	578	
Women with 1 previous caesarean section who enter labour spontaneously	257	44
Normal vaginal deliveries	106	41
Operative vaginal deliveries	26	10
Emergency caesarean section	118	46
Elective caesarean section	7	3
Total caesarean section	125	49

[3] *Maternity Performance Indicator Report 2004-2005. 2006 Department of Human Services*
[4] *Buist R., Holt J., Nayyar R., Stetto J., Baghurst P., Antoniou G. Benchmarking Maternity Care 2000-2005. Women's Hospitals Australasia. 2007.*

The Maternity Performance Indicator Report[3] shows the rate of women who plan VBAC for the birth immediately following a primary caesarean section in Victoria's public hospitals ranges from 7.7 to 74.4%. In addition, the rate of VBAC among women who planned for VBAC in the birth immediately following a primary caesarean section in Victorian public hospitals in 2005 also ranges from 23.1 to 72.2%. The statewide public hospital average of eligible women attempting VBAC in 2005 was 28.1%, with 51.6% of these delivering vaginally.

The WHA Benchmarking Maternity Care Report[4] states that 60% of the women with one previous caesarean section underwent a caesarean without attempting labour. For women who attempted labour, vaginal rates for 2004-2005 vary from less than 40% to 100% with an average of 52%. The overall WHA VBAC rate for the period is 20-23%.

The Victorian and WHA reports comment on the variation in attempting VBAC and the opportunity for hospitals to improve consistency in clinical practice. Any attempt to increase the VBAC rates should be targeted around process for selection and participation in VBAC. In response to this, and to assist women to make informed choices about their birth options, the Women's has developed a number of changes to be implemented in June 2007. This includes the implementation of a new evidence-based CPG, new clinical assessment tools and a consumer decision-aid booklet.

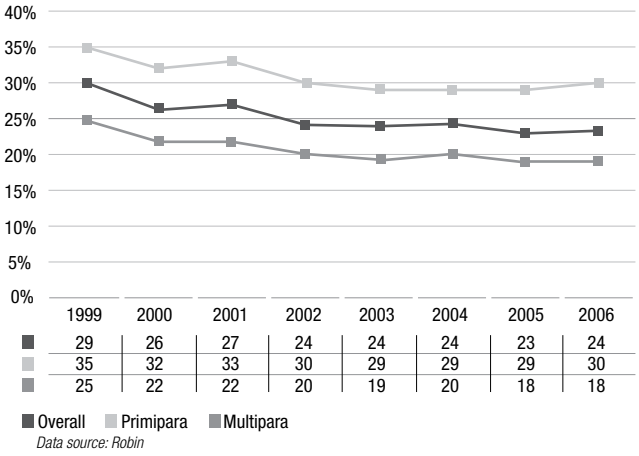
Induction of labour (IOL)

In 2006, 1429 (23.9%) of the 5967 women who delivered at the Women's had an IOL. During this time there has been a change of policy for IOL for uncomplicated post dates with the aim that IOL should not happen before 41 completed weeks of pregnancy.

The apparent higher caesarean section rate with the use of prostaglandin reflects the fact that this agent is used in women with less favourable features for IOL, especially lower Bishop Scores. However, the caesarean section rate may be influenced by the underlying indication for IOL, rather than the method used.

In 2004-2006 the percentage of inductions using prostaglandin was less than in previous years. This does not align with the perceived increase in prostaglandin use, and may indicate a quality data issue.

Figure 7: Induction of labour rates overall and by parity



Data source: Robin

Table 7: Method of Induction of Labour and caesarean section rate for each method

	1999	2000	2001	2002	2003	2004	2005	2006
IOLs with Prostaglandin +/- ARM +/- oxytocics	52%	53%	47%	44%	47%	42%	39%	41%
Caesarean sections with this method	26%	24%	25%	26%	32%	31%	32%	34%
IOLs with Oxytocics +/- ARM	37%	37%	41%	45%	40%	44%	50%	47%
Caesarean sections with this method	17%	19%	18%	19%	20%	24%	22%	25%
IOLs with ARM only	7%	6%	6%	5%	7%	8%	6%	6%
Caesarean sections with this method	14%	3%	10%	11%	10%	18%	15%	16%
IOLs Other (includes misoprostol)	4%	4%	6%	5%	7%	6%	5%	6%

Data source: ROBIN

Table 8: Indications for induction of labour

	1999	2000	2001	2002	2003	2004	2005	2006
Total number of inductions	1556	1375	1310	1134	1172	1296	1361	1429
Post dates %	28.5	27.4	30.2	24.3	26.1	23.8	23.4	26.7
Pre-labor rupture of membranes (including hindwater) %	9.2	12.8	12.4	16.3	16.4	20.8	22.9	21.8
Non-reassuring fetal status %	12.7	10.5	10.7	10.2	13.8	15.3	13.5	15.5
Hypertension/pre-eclampsia (mild + severe) %	14.4	11.7	13.7	13.2	12.1	11.3	10.9	7.6
Fetal abnormality %	4.4	5.1	5.5	5.6	6.1	5.2	6.3	6.4
Diabetes (gestational + pre-pregnant) %	5.7	6.4	5.0	5.1	3.3	4.1	5.8	7.2
Social reasons %	1.7	3.2	2.0	3.9	3.0	4.1	2.5	2.4
Maternal medical condition %	2.6	3.9	2.0	2.0	1.8	1.5	3.2	3.6
Poor obstetric history %	2.6	2.9	2.4	2.4	2.0	2.9	2.4	1.6
Antepartum haemorrhage %	1.7	1.2	1.5	2.5	1.5	3.6	2.8	2.7
Fetal death in utero %	1.5	2.0	1.2	1.5	1.5	1.8	1.9	1.5
Macrosomic baby %	2.5	2.3	1.9	1.7	0.8	1.3	0.6	0.4
Twins %	0.6	0.9	1.1	0.7	1.5	1.4	1.9	1.2
Other %	1.5	1.8	1.5	1.9	1.8	2.6	1.9	1.4
Not specified %	10.5	7.9	9.0	8.7	8.4	0.3	0.0	0.0

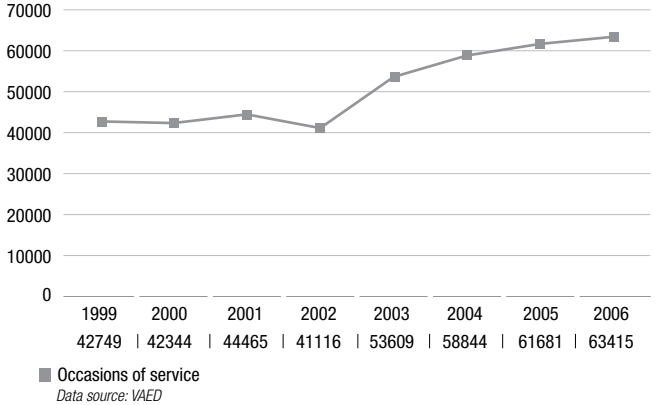
Data source: ROBIN

While postdates pregnancy remains the most common indication for induction of labour, there has been an increase in prelabour rupture of the membranes as an indicator. This could reflect changes in practice relating to neonatal GBS prevention. At the same time, the proportion of IOL for hypertensive disorders has almost halved possibly indicating the management of milder degrees of gestational hypertension has become more conservative. With the establishment of the Fetal Management Unit, there has been an increase in IOL for reasons of fetal anomaly, especially over the last 2 years.

Pregnancy care

Pregnancy care at the Women's is provided to approximately 6500 women who speak at least 60 different languages. Women attend antenatal clinics according to the schedule detailed in the Three Centre Antenatal Guidelines, developed and agreed to by the three major maternity centres in Melbourne - the Women's, Mercy Hospital and Monash Medical Centre.

Figure 8: Maternity antenatal occasions of service



Data source: VAED

The main non-English speaking countries where women were born are Vietnam, Lebanon, China, Turkey, India, Iraq and Somalia.

In addition to the principal antenatal clinics, many women coming to the Women's have special needs. We have established specific pregnancy and post natal services for these women. These include:

- Assessment clinic / Pregnancy booking clinic
- Diabetic clinic
- Fetal management and monitoring
- Multi-pregnancy clinic
- Pregnancy management
- Pregnancy loss clinic
- Preterm clinic
- Obstetric ultrasound
- Women's Alcohol and Drugs Service
- Women with Individual Needs (WIN)
- Thalassaemia
- Pre-admission clinics
- Well Women's Service
- Young Mums

Genetic Counselling Service

The genetic counselling service is a joint service between the Royal Women's Hospital and the Victorian Clinical Genetic Services (Genetic Health Services Victoria and VCGS Pathology). We provide genetic counselling to both inpatients and outpatients of the Women's, professional support through education and training, bereavement support and community education.

Table 9: Types of genetic service consultations

Year	Total consults	Maternal age	Teratogen	Genetics Screening	Maternal Serum	Thalass-aemia	Thal perusal	Fetal abnormalities	Test results
2002	3706	141	156	551	366	725	899	417	21
2003	4432	252	212	813	459	909	909	384	42
2004	3484	501	199	889	463	437	810	307	40
2005	3125	430	140	888	459	265	523	287	40
2006	2986	440	131	835	461	289	444	243	88

Data source: Victorian Clinical Genetic Services

In addition in 2006 there were 2940 phone contacts and 22 ward consultations.

Changes in practice over the period are:

- Anatomical fetal abnormalities were increasingly referred to Fetal Management Unit from 2000. The figures under fetal abnormalities above reflect the women seen by the geneticist in fetal management clinic.
- A representative from the pharmacy began to come to the teratology consults in 2004 and the term Genetic/ Teratology clinic was started.
- Women with iron deficiency were not seen anymore in the Thalassaemia clinic and were referred to their respective antenatal clinics.
- A genetic counselor became available to the pregnancy booking clinic.

The Women's Alcohol and Drug Service

The Women's Alcohol and Drug Service (WADS) is a multidisciplinary statewide service to provide professional support, education and training, research and pregnancy care for high risk women with complex drug and alcohol related issues. Clinical care is based on a harm minimisation approach. The service provides pregnancy care for about 60 women per year.

The majority of women list Australia as their country of birth. This is quite different from the overall cultural profile of women attending for services at the Women's. The main sources of referral are self referral and community health professionals and providers. Women are aged primarily between 20-30 years and the primary drugs used are heroin, methadone, cannabis and alcohol.

Following care as an inpatient and establishment on the methadone stabilisation program, the majority of women are linked with the community pharmacotherapy program.

The 2006 National Clinical Guidelines for the Management of Drug Use during Pregnancy, Birth and the Early Development of the Newborn identified that babies exposed to drugs in utero, other than opiates, such as alcohol, stimulants, sedatives, and some antidepressants can also have Neonatal Abstinence Syndrome (NAS) requiring treatment. This led to a change of definition of NAS. Subsequently, the major Melbourne maternity centres developed a standardised Clinical Practice Guideline (CPG) for Neonatal Abstinence Syndrome for babies.

In 2006, the Women's undertook a study to assess neonatal outcomes for pregnant women with a history of polypharmacy related to opioid substance abuse and buprenorphine. Preliminary findings indicate that babies born to women on polypharmacy are at risk of a range of co-morbidities including jaundice, prematurity, infection and low birth weight. More than half (55.5%) of babies involved in the study had more than one co-morbidity.

Multiple pregnancies

The Multiple Pregnancy Clinic was established in 1997 and was the first multiple pregnancy clinic in Australia. The Clinic provides access to expert obstetric and midwifery care, ultrasound services which are closely integrated with the clinic, as well as nutritional, physiotherapy and social support. The ability antenatally to meet women returning with their twins and triplets for a postnatal visit is a particularly popular aspect of the service. The close integration of ultrasound has led to optimum care of women with a multiple pregnancy, particularly those with complicated pregnancies.

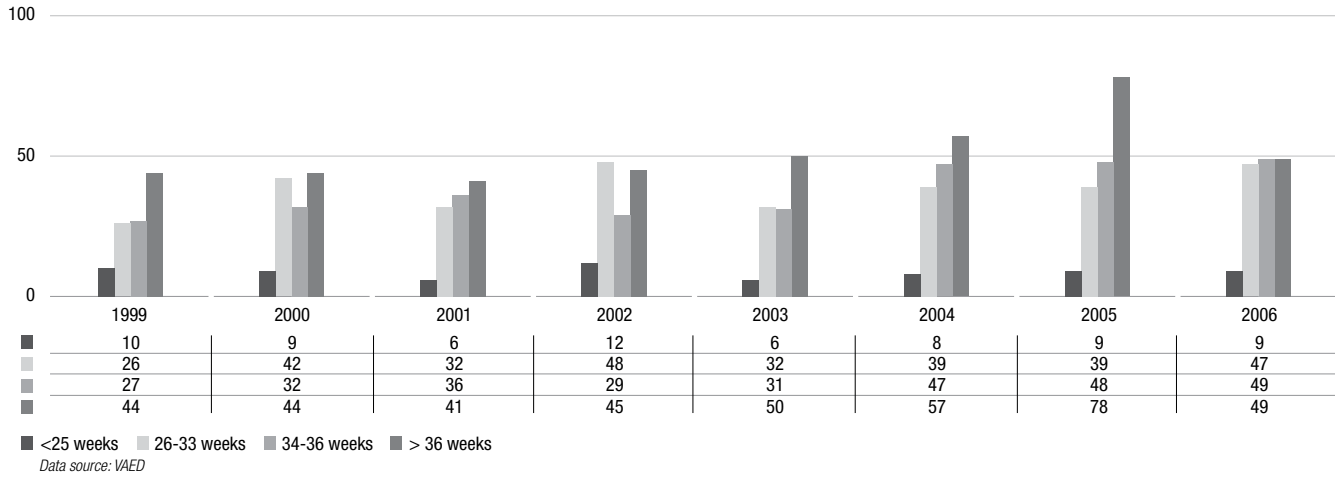
The hospital data confirms the steady increase in twin pregnancies over the last decade. The triplet pregnancy numbers are too small to comment meaningfully on any trends.

Table 10: Twin and triplet pregnancy summary

	1999	2000	2001	2002	2003	2004	2005	2006
Twin pregnancies	107	127	115	134	119	151	174	154
Rate of twins %	2.00	2.45	2.38	2.86	2.44	2.87	2.99	2.59
Triplet pregnancies	8	4	6	2	5	5	4	7
Rate of triplets %	0.15	0.08	0.12	0.04	0.10	0.09	0.07	0.12
Rate of multiple pregnancy %	2.15	2.53	2.50	2.91	2.55	2.96	3.06	2.71

Data source: VAED

Figure 9: Number of twin pregnancies by gestation at birth



Data source: VAED

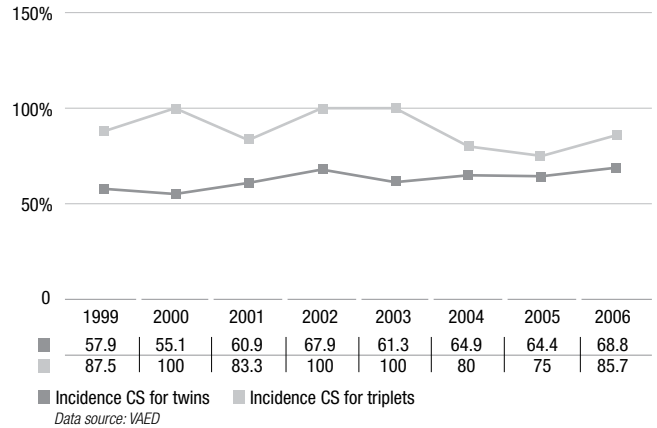
Table 11: Number of triplet pregnancies by gestation at birth

	1999	2000	2001	2002	2003	2004	2005	2006
<25 weeks	2	0	1	0	0	0	0	2
26-33 weeks	4	1	3	2	3	3	3	3
34-36 weeks	2	3	2	0	2	2	1	2
> 36 weeks	0	0	0	0	0	0	0	0

Data source: VAED

Caesarean section rates have steadily climbed for twin pregnancies and remain high for triplet pregnancies.

Figure 10: Incidence of CS for multiple pregnancy



Data source: VAED

Over the last five years, there has been the reduction in higher order multiple pregnancies as a result of reduction in the number of embryos transferred during IVF cycles, careful management of ovulation induction cycles and earlier use of IVF, with a more controlled outcome in the number of pregnancies.

The Multiple Pregnancy Clinic has been actively involved in the establishment of Mothers And Twin Children (MATCH). MATCH is an initiative of the Australian Twin Registry. It has aimed to recruit mothers and their twin children during pregnancy and record accurately prospective information about the method of conception, pregnancy complications and pregnancy and neonatal outcomes. DNA is collected from cord samples and stored for future research. The Multiple Pregnancy Clinic is also recruiting women for a major epigenetic study funded by the National Health and Medical Research Council.

The Multiple Pregnancy Clinic has been closely associated with the establishment of the Victorian Fetal Therapy Service. This allows more options for management, particularly of complicated multiple pregnancies. These will include cases of Twin-Twin Transfusion Syndrome, TRAP sequence, fetal growth restriction and discordant fetal anomalies.

Fetal Management Unit

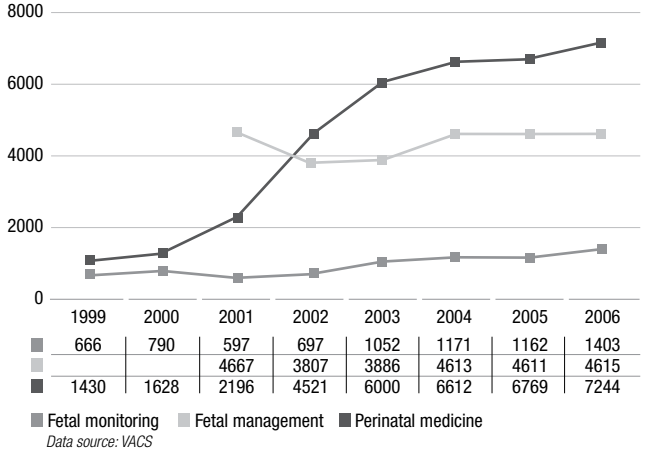
The Fetal Management Unit (FMU) has the principal role in the diagnosis and management of fetal abnormalities and fetal complications of pregnancy. The unit is a multidisciplinary team comprising maternal fetal medicine (MFM) sub specialists, specialist ultrasonologists, radiologists, specialist midwives, neonatologists, geneticists, genetic counselors, paediatric surgeons and social workers. The development of this team is one of our major innovations, providing unique expertise. There are 2 MFM subspecialist trainee positions as well as 2 COGU (Certificate of Obstetric and Gynaecology, ultrasound specialty). The team also has access to other specialist services such as paediatric plastic surgeons as required.

Referrals are received from within the hospital, broader metro Melbourne, rural Victoria, particular the North West and from interstate. Approx 8-10 new referrals are received each week. Most women are seen within 2 weeks.

Of all referrals, just under half of women seen go on to deliver at the Women's, just under half have a termination of pregnancy and the remainder are referred back to their parent hospital.

We receive more cardiac referrals because our proximity to the Royal Children's Hospital and its cardiac surgery program particularly for hypoplastic left heart syndrome.

Figure 11: Occasions of service in Fetal Management Unit outpatients



Data source: VACS

Hypertension in pregnancy

The hypertensive disorders of pregnancy remain a common and major contributor to obstetric morbidity. The safe management, particularly for those women who develop pre-eclampsia, necessitates induction of labour or for the more severe cases delivery by caesarean section. The data are suggestive that the trend towards caesarean section has increased over the past seven years.

Table 12: Hypertension in pregnancy coded at delivery episode

	1999	2000	2001	2002	2003	2004	2005	2006
Pre-existing hypertension complicating Pregnancy	48	27	22	10	32	22	29	22
Pre-existing hypertension with superimposed proteinuria	4	0	0	0	0	0	0	2
Gestational hypertension	217	224	267	238	244	255	229	213
Pre-eclampsia	102	79	102	86	102	98	93	85
Unspecified maternal hypertension	114	61	19	12	26	45	37	29
Total	485	391	410	346	404	420	388	351

Data source: VAED

Table 13: Mode of delivery in women with gestational hypertension and pre-eclampsia

	1999	2000	2001	2002	2003	2004	2005	2006
Normal Vaginal (no intervention)	118	132	148	124	119	134	86	84
Forceps	32	39	41	16	30	17	34	19
Vacuum	20	15	27	34	23	35	28	29
Caesarean Section	149	117	153	150	174	167	174	166
Rate of Caesarean Section Rate %	46.7	38.6	41.5	46.3	50.3	47.3	54.0	55.7
Total	319	303	369	324	346	353	322	298

Data source: VAED

Eclampsia

Eclampsia, the occurrence of a convulsion in association with pre-eclampsia, remains a rare but serious complication of pregnancy. Rates of eclampsia among women remain steady during the period under review.

Table 14: Numbers of women with eclampsia

1999	2000	2001	2002	2003	2004	2005	2006
3	1	2	5	5	4	3	0

Data source: ROBIN

Of the women treated at the Women's, some have been transferred following the episode of eclampsia and some have eclampsia during their care at the Women's. The majority of cases of eclampsia occur intrapartum or in the puerperium.

Diabetes in pregnancy

The Diabetes Unit provides an integrated multidisciplinary service for women with diabetes in pregnancy, including women with diabetes prior to pregnancy and those who develop gestational diabetes. An important part of this care is in preconception counselling. More recently, the unit has also undertaken the care of women with other endocrine disorders in pregnancy, largely thyroid disease, and is also providing ongoing gynaecological and endocrine care for women with Turner Syndrome.

Table 15: Occasions of outpatient service for women with diabetes in pregnancy

	1999	2000	2001	2002	2003	2004	2005	2006
Physicians	1741	1548	1397	1246	1349	1290	1199	1241
Obstetric Diabetes	1364	1605	1664	1484	1823	1663	1501	1941

Data source: VACS

Pre-pregnancy diabetes

The table below shows that while the rate of pre-pregnancy diabetes has remained constant over the period of this report, the relative contributions of Type 1 and Type 2 diabetes have changed so that now women with Type 2 diabetes comprise about 50% of women with pre-pregnancy diabetes. This is consistent with the increase in type 2 diabetes in the community, sometimes referred to as the epidemic of "diabesity".

Table 16: Pre-pregnancy diabetes summary

	1999	2000	2001	2002	2003	2004	2005	2006
Number of women giving birth	54	36	32	29	44	41	42	62
Type 1 (IDDM)	44	22	17	16	27	20	20	34
Type 2 (NIDDM)	10	14	13	12	16	20	22	25
Other and Unspecified	0	0	2	1	1	1	3	3
Incidence of pre-pregnancy diabetes for all women %	1.0	0.7	0.7	0.6	0.9	0.8	0.7	1.0
Incidence of Type 2 diabetes in this group %	18.5	38.9	40.6	41.4	36.4	48.8	52.4	40.3

Data source: VAED

In line with most protocols, we advocate induction of labour at about 39 weeks' gestation in these women, which accounts for the high rate of induction of labour. The caesarean section rate is also high at about 60%, half of which are elective.

Table 17: Mode of birth of women with pre-pregnancy diabetes

	1999	2000	2001	2002	2003	2004	2005	2006
Normal vaginal birth	18	11	10	8	15	10	11	17
Operative vaginal	3	4	4	3	1	0	1	9
Total vaginal births	21	15	14	11	17	10	12	26
Caesarean section	33	21	18	18	27	31	30	36
Caesarean section rate %	61.1	58.3	56.3	62.1	61.4	75.6	71.4	58.1
Induction	28	17	10	9	15	16	14	31
Induction rate %	51.9	47.2	31.3	31.0	34.1	39.0	33.3	50.0

Data source: VAED

Our outcomes are in keeping with international experience, with a perinatal mortality rate around 40/1,000. The feared complication of late stillbirth has not been entirely eliminated, with the stillbirth rate remaining at about 20-30/1,000. The rate of shoulder dystocia has shown a decline over the period of this report. For this report we were unable to show the incidence of congenital abnormality.

Table 18: Birth outcomes for babies born to women with pre-existing diabetes in pregnancy

	1999	2000	2001	2002	2003	2004	2005	2006
Total babies born	56	37	33	30	44	42	45	64
Stillborn	1	1	4	1	1	1	0	2
Neonatal Deaths	N/A	N/A	N/A	N/A	N/A	1	1	1
Perinatal Mortality Rate (per 1,000)						48	22	47

Data source: VAED

Gestational diabetes

The incidence of gestational diabetes declined in 2003/2004, but has now risen back to close to 5%, in line with most centres. It is not clear why there was this apparent fall – there is always the possibility of incomplete screening of women or coding issues. The data for insulin use in 1999 and 2000 were not recorded, but since then about 50% of women with gestational diabetes have required insulin to achieve normoglycaemia.

Table 19: Gestational diabetes summary

	1999	2000	2001	2002	2003	2004	2005	2006
Number of women with gestational diabetes giving birth	262	281	237	217	166	199	266	278
Incidence %	4.9	5.4	4.9	4.6	3.4	3.8	4.6	4.7
Women requiring insulin therapy	NA	NA	118	117	89	89	154	150
Rate of women requiring insulin therapy %	NA	NA	49.8	53.9	53.6	44.7	57.9	54.0

Data source: VAED

Our protocols call for induction of labour in these women at 38-39 weeks if there is suspicion of macrosomia, otherwise at not later than 41 weeks. This accounts for the higher induction rate. Whilst the caesarean section rate is higher that the overall hospital figure, this would be expected and is relatively stable.

Table 20: Mode of birth for women with gestational diabetes

	1999	2000	2001	2002	2003	2004	2005	2006
Normal Delivery	125	139	112	96	68	87	126	133
Instrumental	34	40	21	22	14	26	43	27
Caesarean Section	103	102	104	99	84	86	97	118
Caesarean Section Rate %	39.31	36.30	43.88	45.62	50.60	43.22	36.47	42.45
Induction	108	116	90	79	46	62	94	99
Induction Rate %	41.2	41.3	38.0	36.4	27.7	31.2	35.3	35.6

Data source: VAED

There were two neonatal deaths from 2004 to 2006 in women with gestational diabetes, one attributed to congenital abnormality and one to spontaneous preterm delivery. The perinatal mortality rate has remained in keeping with the general rate in the population, though the rate of shoulder dystocia is still higher than the rest of the hospital population. The ACHOIS study showed that identification and treatment of women with hyperglycaemia in pregnancy reduces adverse outcomes such as shoulder dystocia. The recently competed international HAPO study, should give us a better idea of which women really need the intensive monitoring the unit provides. We participated in the recently completed trial of metformin in women with gestational diabetes, which suggested that half of the women on insulin can be treated with metformin alone.

Table 21: Birth outcomes for babies born to women with gestational diabetes in pregnancy

	1999	2000	2001	2002	2003	2004	2005	2006
Total babies born	269	286	249	227	173	212	280	289
Stillborn	1	2	0	3	0	2	4	0
Neonatal deaths	N/A	N/A	N/A	N/A	N/A	1	0	1
Perinatal mortality rate (per 1,000)	N/A	N/A	N/A	N/A	N/A	14	14	3
Total sets of multiple births	7	4	14	9	8	14	12	11
Multiple birth rate %	2.7	1.4	5.9	4.1	4.8	7.0	4.5	4.0

Data source: VAED

Diabetes is a known risk factor for shoulder dystocia, due to the tendency for babies born to diabetic mothers to weigh more and as expected, the rate of shoulder dystocia among women with either gestational or pre-existing diabetes delivering vaginally is 4.9%, double the overall rate for the hospital. Previous studies have shown this to be independent of birth-weight. There may be a role for elective caesarean section in women with diabetes when the predicted birth weight is >4,000g, and definitely >4,500g. The American College of Obstetricians and Gynaecologists (ACOG) opinion is that caesarean section should also be offered to women without diabetes when the estimated fetal weight exceeds 5,000g.

Table 22: Rate of shoulder dystocia for ALL vaginal births in the diabetes unit, subdivided by birth-weight

	1999	2000	2001	2002	2003	2004	2005	2006
Number of women in the diabetes unit who delivered vaginally	160	179	86	114	90	100	177	181
Number with shoulder dystocia	7	10	7	3	6	4	6	10
Incidence of shoulder dystocia %	4.4	5.6	8.1	2.6	6.7	4.0	3.4	5.5
Birth-weight <3,500g	1	2	0	2	0	2	0	2
Birth-weight 3,500-3,999g	3	1	3	1	0	0	3	1
Birth-weight 4,000-4,499g	3	6	3	0	1	2	3	5
Birth-weight ≥4,500g	0	1	1	0	2	0	0	2

Data source: RWH ROBIN and VAED data

Antepartum haemorrhage (APH)

Table 23: Women with APH in the birth episode

	1999	2000	2001	2002	2003	2004	2005	2006
Proven abruption	41	39	47	44	40	57	59	64
Incidence of proven abruption %	0.77	0.75	0.97	0.94	0.82	1.07	1.01	1.07
Proven placenta praevia with haemorrhage	45	51	46	45	37	42	39	49
Incidence of proven placenta praevia with haemorrhage	0.85	0.98	0.94	0.96	0.76	0.79	0.67	0.82
APH unspecified	85	98	82	104	105	123	131	139
Incidence of APH unspecified	1.60	1.89	1.68	2.22	2.15	2.32	2.25	2.33
Total APH	171	188	175	193	182	222	229	252
Incidence of APH %	3.2	3.6	3.6	4.1	3.7	4.2	3.9	4.2

Data source: VAED

Table 24: Caesarean section rate for women with APH in birth episode

	1999	2000	2001	2002	2003	2004	2005	2006
Overall CS rate %	55.6	51.1	47.4	50.3	50.0	48.2	50.7	47.4
CS rate proven abruption in birth episode %	68.3	66.7	48.9	68.2	77.5	59.6	62.7	57.1
CS rate proven placenta praevia with haemorrhage in delivery episode %	91.1	84.3	91.3	88.9	91.9	92.9	92.3	93.9
CS rate APH unspecified in the birth episode %	29.4	27.6	22.0	26.0	24.8	26.8	32.8	27.3

Data source: VAED

Table 25: Birth outcome of babies born to women with APH (total)

	1999	2000	2001	2002	2003	2004	2005	2006
Live born	159	182	166	182	177	212	223	240
Neonatal deaths	na	na	na	na	na	8	6	11
Still born	13	6	10	13	5	10	9	12
Perinatal mortality per 1000 births	na	na	na	na	na	78.3	63	87.5

Data source: VAED/Perinatal database

Table 26: Delivery outcome with proven abruption in birth episode

	1999	2000	2001	2002	2003	2004	2005	2006
Live born	35	35	41	41	38	52	55	58
Neonatal deaths	na	na	na	na	na	5	1	8
Still born	6	4	6	3	2	5	5	6
Perinatal mortality per 1000 births	na	na	na	na	na	161.3	98.4	194.4

Data source: VAED

Table 27: Birth outcome of babies with proven placenta praevia in birth episode

	1999	2000	2001	2002	2003	2004	2005	2006
Live born	45	50	45	43	37	41	39	48
Neonatal deaths	na	na	na	na	na	2	0	1
Still born	0	1	1	2	0	1	0	1
Perinatal mortality per 1000 live births	na	na	na	na	na	68.2	0	40

Data source: VAED

Table 28: Birth outcome of babies with APH unspecified in birth episode

	1999	2000	2001	2002	2003	2004	2005	2006
Live born	79	97	80	98	102	119	129	134
Neonatal deaths	na	na	na	na	na	1	5	2
Still born	7	1	3	8	3	4	4	5
Perinatal mortality per 1000 live births	na	na	na	na	na	40.4	65.2	49.6

Data source: VAED

Antepartum haemorrhage (APH) remains a common and feared complication of pregnancy. It contributes substantially to perinatal mortality. Furthermore, three of the five maternal deaths in this clinical report were due to APH and its sequelae. These three cases involved preterm emergency deliveries, with coagulopathy being a common theme.

The frequency of APH has not changed over the period of this report, remaining at about 4%. The relative contribution of the two major identified causes, placental abruption and placenta praevia, has also remained constant, with each contributing about one quarter of the cases, with abruption being slightly more common. In one half of the cases of APH, no specific cause is identified, so this remains the largest single group. Previous caesarean section is known to be a risk factor for placenta praevia. However, despite the rising caesarean section rate, there has been no increase in placenta praevia, but a slight increase in abruption.

As expected the caesarean section rate was highest for placenta praevia, as only very mild grades can be delivered vaginally. Again as expected, the perinatal mortality rate was highest for placental abruption, and in fact higher for unspecified APH than placenta praevia. This probably reflects the fact that some of the unspecified APH are in fact abruptions.

The challenge in the management of these patients is appropriate timing of delivery, balancing the risk to the fetus of prematurity if delivered too soon against the risk of fetal death if left too long and the ongoing risk to the mother of remaining undelivered. Women with high-grade placenta praevia who have had an APH are traditionally managed with long-term hospitalization, often after being referred from rural and regional hospitals. The reason for hospitalization is the risk of sudden exsanguination – which is real, but very rare. It is possible that many of these women could be managed either as outpatients, or at least in close but non-hospital accommodation.

Shared Maternity Care

Shared Maternity Care is a model of maternity care offered at and supported by the Women's since the early 1990s. In this model of care, women undertake the majority of their antenatal visits in the community with a hospital accredited general practitioner or community midwife and have their baby at the hospital. It is a popular choice for healthy women with a normal pregnancy, with about 1500 women per year choosing shared care.

Six hundred and eighty-six general practitioners and obstetricians and 11 community midwives are accredited for shared care. The one set of accreditation criteria and process for general practitioners and obstetricians is now consistent amongst the four major maternity hospitals in our region – the Women's, Mercy Hospital for Women, Sunshine Hospital and the Northern Hospital, having been developed in consultation with professional bodies.

These accredited shared care general practitioners and community midwives (shared maternity care affiliates) are supported by the Women's to provide quality and evidence based care through clinical practice guidelines, website access to information, access to web based clinical results and information, regular continuing professional development sessions and the shared maternity care coordinator and general practice liaison officer.

An audit of 120 women in February 2006 found most women (82%) chose to undertake care with their regular GP or GP clinic, with 100% of women being very satisfied (85%) or satisfied (15%) with the care they received. Common reasons for their choice were less travel (69%), less waiting time (49%), trust in their GP (43%) and that their GP will see their baby after birth (43%). Twenty-six percent (26%) of the women mainly spoke a language other than English at home, with 25% requiring an interpreter.

The Ministerial Review of Birthing Services in Victoria, Having A Baby in Victoria, 1990, recommended the importance of programs being designed to meet the needs of women of non-English speaking backgrounds, Aboriginal women, young women, women with disabilities and women on low incomes". Anecdotally it has been suggested shared maternity care was not well taken up by women from a culturally and linguistically diverse (CALD) background. This audit demonstrates that shared maternity care is well supported by women from CALD backgrounds (43.2%), perhaps even more so than other modes of maternity care (37.3%, overall).

Regular audits have been undertaken over the past few years in order to improve service provision to shared care affiliates and women enrolled in shared care and to provide the basis of an ongoing approach to improving the quality of care. The major focus of the audits is communication between hospital and community providers of shared antenatal care. Although the audits show continuing improvement, in general, shared care practitioners are better at communicating key information to the hospital than vice versa. Constraints in the hospital's electronic information systems are a key barrier to improved communication.

Maternal mortality and morbidity

Maternal mortality 1999-2006

Table 29: Maternal deaths 1999-2006

	1999	2000	2001	2002	2003	2004	2005	2006	TOTAL
Direct	–	2	–	2	–	1	–		5
Indirect	–	–	–	–	–	–	–	1	1
Incidental	–	–	–	–	1	–	–	–	1
Late maternal deaths	–	–	–	–	–	–	–	–	–
TOTAL	–	2	–	2	1	1	–	1	7

Data source: Victorian Consultative Council on Obstetric and Paediatric Mortality and Morbidity

Each maternal death is subjected to a multi-disciplinary review both at the Women's and by the Maternal Mortality Committee of the Victorian Consultative Council on Obstetric and Paediatric Mortality and Morbidity and are included in their annual reports. Deaths are also reviewed by the Coroner.

Maternal deaths (defined as the death of a woman while pregnant or within 42 days of the termination of pregnancy) are classified in Australia as:

- Direct – if they result from obstetric complications of the pregnant state
- Indirect – if they result from a pre-existing disease or a disease that develops during pregnancy and which was not due to direct obstetric causes but was aggravated by the physiological effects of pregnancy
- Incidental – if they occur during pregnancy but where the pregnancy is unlikely to have contributed significantly to the death

Of the five direct maternal deaths, four women died from post partum haemorrhage, three of whom had amniotic fluid embolism, and one had an abruption with refusal of blood products. The cause of the fifth death was classified as undetermined – possibly a cardiac conduction disturbance. Two maternal deaths occurred at term, one of undetermined cause and one from haemorrhage associated with amniotic fluid embolism. Three of the five women delivered preterm and all three were associated with abruption. One of these three women had an abruption with placenta praevia. The indirect death and the incidental death were women who died after discharge from hospital and were both associated with combined drug toxicity, including use of heroin.

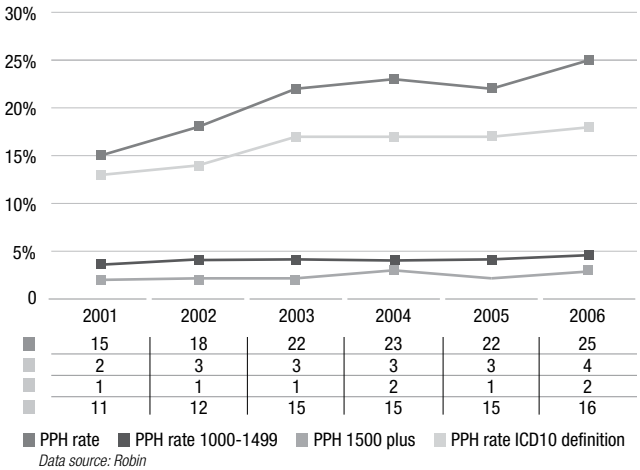
The Maternal Mortality Ratio (MMR) for the Women's for in-hospital maternal deaths was 16.64/100,000 women who gave birth. To enable this to be seen in context the MMR for Australia for the 2000-2002 triennium (which is the latest published report) was 11.1/100,000 women and the Victorian MMR for the same period was 9.2/100,000. The figure is acceptable, given the tertiary nature of the hospital and provision of specialist Women's Alcohol and Drugs Services.

Postpartum haemorrhage

In 2006, the postpartum haemorrhage (PPH) rate at the Women's (applying the WHA 500ml definition) was 25.5%. This rate has increased since 2001. This increase is consistent with national trends and partially reflects the increasing caesarean birth rate. Applying the ICD10-AM definition for PPH (≥ 750mL blood loss for caesarean births and ≥ 500mL for vaginal births) the PPH rate is 16%.

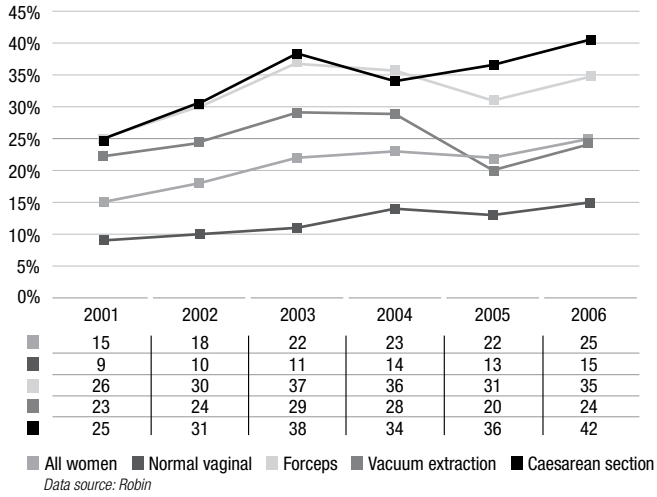
According to the WHA Benchmarking Maternity Care Report, the rate of blood loss ≥ 1500ml during vaginal birth for Australasian hospitals rose from 0.79% in 2000-2001 to 1.14% in 2004-2005.

Figure 12: PPH rates % overall by volumes



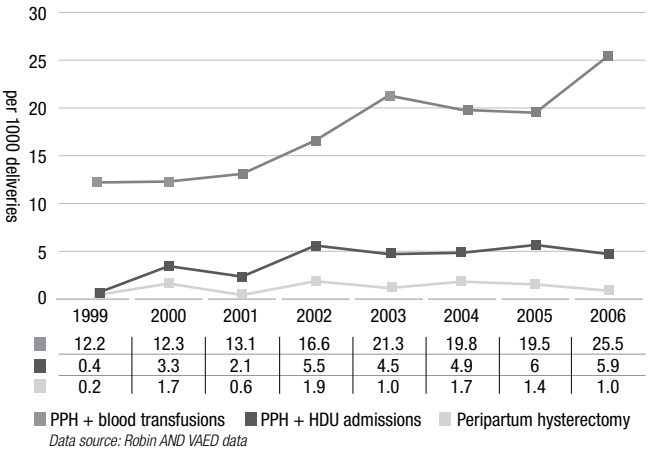
Data source: Robin

Figure 13: PPH (500 mls) rates by mode of delivery



Data source: Robin

Figure 14: Transfusion and high dependency care following PPH per 1000 women giving birth



Data source: Robin AND VAED data

The apparent increase in blood transfusion numbers in 2006 is not matched by an increase in admissions to the HDU or peripartum hysterectomies. In addition, there is no increase in PPH volumes of 1500ml or more. The reason for the apparent increase in 2006 is not clear at present and may reflect data issues. Data collection for blood transfusions prior to 2002 is not complete because of coding differences.

Since 2004, there have been a number of initiatives to address PPH, including early recognition and management, standardised responses, measurement of blood loss and support for women. An Estimated Blood Loss Enquiry (EBLE) has been initiated to address the accurate measurement of blood loss and recognition of PPH. Three other metropolitan maternity units have repeated the study at their facilities. Results from all maternity units concur with the published literature on this subject that blood loss is underestimated. Strategies have been implemented to improve recognition of blood loss that may lead to maternal morbidity.

Peripartum hysterectomy

The WHA Benchmarking Maternity Care Report identifies an increasing rate of peripartum hysterectomy (from 0.58 per thousand in 2000-01 to 0.93 per thousand in 2004-05).

Despite the increased rate of caesarean section at the Women's, there is no observed increase in peripartum hysterectomy associated with morbidly adherent placenta or previous caesarean section. During the period of this report, 2 new techniques for controlling severe PPH have been introduced, namely the B-Lynch suture and the Bakri catheter for uterine tamponade. The use of these techniques may have prevented some peripartum hysterectomies.

Table 30: Peripartum hysterectomy +/- postpartum haemorrhage

	1999	2000	2001	2002	2003	2004	2005	2006
Peripartum hysterectomy	1	9	3	9	5	9	8	6
Peripartum hysterectomy per 1000 deliveries	0.2	1.7	0.6	1.9	1.0	1.7	1.4	1.0
Peripartum hysterectomy + adherent placenta	N/A	N/A	N/A	N/A	1	1	4	2
Peripartum hysterectomy + adherent placenta per 1000 deliveries	N/A	N/A	N/A	N/A	0.2	0.2	0.7	0.3
Peripartum hysterectomy + previous c/section	1	3	2	3	2	3	4	1
Peripartum hysterectomy + previous c/section per 1000 deliveries	0.2	0.6	0.4	0.6	0.4	0.6	0.7	0.2

Data source: VAED

Shoulder dystocia

The overall rate of shoulder dystocia during the years of the review was 2.5% of women delivering vaginally. This remained stable over the years of the review.

Table 31: Rate of shoulder dystocia for ALL vaginal deliveries

	1999	2000	2001	2002	2003	2004	2005	2006
Rate of shoulder dystocia %	2.3	2.5	2.0	2.2	2.2	3.4	2.5	2.6

Data source: ROBIN and VAED

Of the total number of admissions to neonatal nurseries of term babies delivered vaginally, the overall proportion of babies with shoulder dystocia admitted was 15%. This has remained steady over the years.

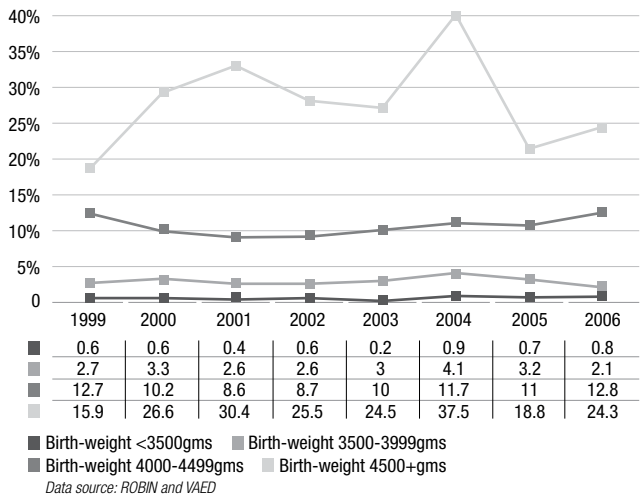
Table 32: Admission to Neonatal Nurseries of babies following shoulder dystocia

	1999	2000	2001	2002	2003	2004	2005	2006
Number admissions following shoulder dystocia	15	21	12	12	11	11	10	15
Rate of admissions following shoulder dystocia	16.0	21.0	16.2	16.2	14.5	8.7	9.4	13.8

Data source: ROBIN and VAED

On closer examination, it is clear that fetal weight is closely related to the incidence of shoulder dystocia. Birth weights over 4499g have a 25.5% chance of shoulder dystocia compared to 10.8% for birth weights between 4000 and 4499g. Audit of the records shows that reporting of shoulder dystocia is somewhat subjective. A thorough study would require detailed scrutiny of each record. The hospital has implemented an evidence-based CPG for the management of women with shoulder dystocia.

Figure 15: Rate of shoulder dystocia for all vaginal births in birth-weight bands



Data source: ROBIN and VAED

Uterine rupture

Table 33: Number of women with uterine rupture excluding ruptures related to extension of incision during caesarean section

1999	2000	2001	2002	2003	2004	2005	2006
3	4	0	8	3	0	1	0

Data source: ROBIN

Uterine rupture is a sporadic event and there appear to be no obvious trends in the data. The uterine rupture rate is probably somewhat dependent on the number of women attempting VBAC, as previous uterine scar is the most common cause. Lower rates of uterine rupture may reflect fewer women attempting VBAC.

Third and fourth degree tears

Because third and fourth degree tears can cause both short and long-term maternal morbidities, the identification of tears has improved along with audit of second stage. Women with significant perineal trauma are referred to Urogynaecology Service for ongoing assessment.

Table 34: Incidence of third and fourth degree tears

	1999	2000	2001	2002	2003	2004	2005	2006
3rd Degree Tear	91	67	63	91	65	66	101	138
Incidence %	2.3	1.7	1.7	2.7	1.9	1.8	2.4	3.3
4th Degree Tear	2	6	1	7	8	7	2	13
Incidence %	0.0	0.2	0.0	0.2	0.2	0.2	0.0	0.3

Data source: VAED

Breech

Table 35: Outcomes for breech versions

	1999	2000	2001	2002	2003	2004	2005	2006
Successful ECV	15	18	11	6	5	10	22	33
Failed ECV	10	27	5	11	7	18	32	28

Data source: VAED

Table 36: Birth outcomes for breech presentation (includes preterm births)

Robson Group characteristics	No. of women in group (%) of all women	Vaginal births (%)	Elective C/S (%)	Emergency C/S (%)
Women who have had no previous live births and no previous stillbirths, and are having a singleton pregnancy with a breech presentation.	161 (3%)	27 (17%)	57 (35%)	77 (48%)
Women who have had one or more previous live or still births, and are having a singleton pregnancy with a breech presentation.	116 (2%)	30 (26%)	43 (37%)	43 (37%)

Data source: ROBIN

Between 3-4% of all term pregnancies will remain in breech presentation and there is an association with increasing maternal age. Recent research indicates that it is safest for babies in a breech presentation to be born by caesarean section (CS). However, increasing caesarean section rates contribute to increased maternal morbidity and mortality. Research evidence supports turning breech babies using external cephalic version (ECV) beginning at 37 weeks gestation to significantly lower the CS rate and thus reduce adverse outcomes for women. Although ECV at this time is effective, the procedure is only successful somewhat less than half the time.

Since 2005, the Women's has participated in an international multicentre randomised controlled trial to investigate the success of early ECV. The pilot study showed a decrease of about 10% in the rate of non-cephalic presentation at birth with ECV performed before 36 weeks gestation. We have enrolled about 14 women in the trial which has a sample size of 1460. At the time of writing, recruitment is over two thirds complete.

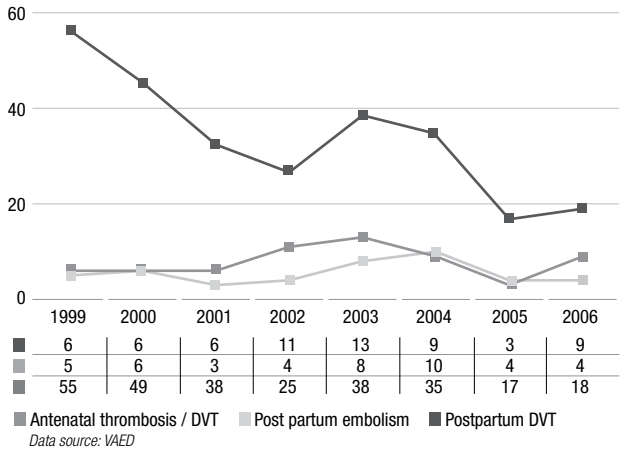
For nulliparous women with breech presentations who delivered vaginally, 74% delivered before viability and 82.5% gave birth prior to 37 weeks. Of the emergency caesarean sections, 52.5 % of the women delivered prior to 37 weeks.

Breech presentation is more common in preterm labour and vaginal breech delivery may be the most appropriate depending on the clinical situation.

Thrombo-embolism

A CPG for thrombo-prophylaxis post caesarean section was introduced late in 2004 to improve consistency of practice.

Figure 16: Number of thrombo-embolism events for admitted antenatal and postnatal women



Data source: VAED

Other morbidity

Table 37: Numbers of other birth episode morbidity

	1999	2000	2001	2002	2003	2004	2005	2006
Cord prolapse	11	23	16	17	20	21	24	11
Failed Instrumental birth								
Failed Forceps	24	24	15	14	11	18	22	19
Leading to CS	17	19	12	14	11	15	21	18
Leading to vacuum	4	2	1	0	0	3	1	1
Failed vacuum	96	89	54	31	88	144	107	100
Leading to CS	15	12	16	8	15	27	25	30

Data source: VAED

Re-admissions following discharge

Table 38: Numbers of re-admissions following birth

	1999	2000	2001	2002	2003	2004	2005	2006
Day admission for breast feeding support	52	39	54	409	1635	1386	1646	1525
Retained Products of Conception	48	41	37	29	38	37	25	18
Infection of obstetric wound including CS and episiotomy	19	11	14	23	13	18	32	30
Other post natal infections (inc. UTI, GTI, mastitis, prexia NOS)	39	29	40	31	29	35	41	48
Psychiatric re-admission	28	29	30	37	57	41	35	19

Data source: VAED

Victorian Maternity Services Indicators 2002-2006

The Women's performance on the clinical indicators is either better than or consistent with Victorian averages. Some women will have had antenatal corticosteroids prior to transfer. These indicators have been the basis of Victorian forums on caesarean section rates and vaginal birth after caesarean section. Interpreter provision and clinic waiting times are affected by the high maternity throughput and high level of demand for interpreters. The smoking indicators require smoking prompts to be asked twice prior to 19 weeks. However, many women will not have two hospital antenatal visits prior to 19 weeks.

Table 39: The Women's Maternity Service Performance Indicators

		2003-4	2004-5	2005-6	2005-6
Indicator		**RWH**	**RWH**	**RWH**	**VIC average**
MAT-1a	Rate of inductions in standard primiparae	21.50%	8.80%	6.80%	15.90%
MAT-1b	Rate of caesarean section in standard primiparae	23.70%	18.80%	14.70%	18.60%
MAT-1c	Rate of 3rd/4th degree perineal tears in standard primiparae giving birth vaginally	3.10%	2.90%	4.30%	4.70%
MAT-2	Term infants transferred/admitted to SCN/NICU for reasons other than birth defect	5.60%	6.10%	5.16%	9.90%
MAT-3	Rate of administration of antenatal corticosteroids to women delivered/transferred before 34 weeks	91.00%	89.00%	90%	92.30%
MAT-4a	Rate of women who plan for VBAC for the birth immediately following a primary caesarean section	37.20%	35.70%	40.60%	28.10%
MAT-4b	Rate of VBAC among women who planned for VBAC immediately following primary caesarean section	41.50%	50.00%	51.20%	51.60%
MAT-5	*GSPMR excluding all TOPs and deaths due to congenital malformations (five years pooled data)	84	88	87.4	100 (unity)
MAT-6	Rate of women referred to postnatal domiciliary care or Hospital-In-The-Home	88.00%	93.00%	94.40%	91.60%
MAT-7a	Rate of women offered appropriate interventions in relation to smoking (Ask/Assess/Advise/Assist)	77.20%	95.60%	96.90%	95.80%
MAT-7b	Rate of women offered appropriate interventions in relation to smoking (Ask again)	18.40%	18.10%	9.80%	70.00%
MAT-8	Number of WHO Ten steps to successful breastfeeding achieved	10/10	10/10	10/10	9/10
MAT-9	Rate of women who wait more than 30 minutes for hospital antenatal clinic services	34.00%	36.40%	31.40%	14.20%
MAT-10a	Rate of women assessed for interpreter requirements	99.70%	98.80%	98.90%	99.10%
MAT-10b	Rate of women (from MAT-10a) provided with appropriate interpreter services	60.00%	73.70%	79.40%	82.20%

Data source: Department of Human Services Maternity Services Indicator Reports **GSPMR mean Gestation standardized perinatal mortality ratio*

[5] *Maternity Services Indicator Report 2004-5; Department of Human Services. 2006*

Breast feeding

Current data does not provide meaningful breast feeding rates. The Breastfeeding Education and Support Service (BESS) offers a range of services to women as outpatients and inpatients. In 2005-06, BESS saw 711 women, of whom 488 were first time mothers and admitted 677 women as day admissions to support breast feeding. Seventy-one women had a baby in the neonatal nurseries. Most women who used BESS (488) were having their first baby and 161 women were multigravidas. The Women's has achieved accreditation as part of the World Health Organisation Baby Friendly Hospital Initiative (BFHI).

Babies born at term and admitted to the Neonatal Nurseries

Each year over 6000 babies are born at the Women's. Inborn term infants without birth defects are not normally expected to be admitted to Neonatal Intensive / Special Care (DHS Measuring Maternity Care, 2002: 32). Unplanned admission of term infants to the nurseries may indicate adverse events occurring during labour or immediate neonatal period, inappropriate use of resources or non-adherence to Neonatal Intensive / Special Care admission guidelines.

In 2006 there were 5314 term babies born at the Women's. Of these, 316 (6%) babies (without previously identified congenital abnormalities) were transferred to Neonatal Intensive/Special Care.

The four most common reasons for admissions in 2006 are suspected respiratory distress (including grunting), suspected sepsis, cardiorespiratory depression at birth and maternal diabetes.

Since October 2005 the Women's has collected data on a weekly basis regarding term inborn admissions to Neonatal Intensive/Special Care. This data is reviewed at a weekly multidisciplinary forum. In addition, a monthly critical review of all available neonatal and obstetric records related to these admissions by a neonatologist and obstetrician. The purpose of this review is to establish an accurate diagnosis for admission, whether any admissions are preventable and whether neonatal or obstetric practices could be improved. It is anticipated these reviews will impact prospectively on the optimum use of resources and lower the rate of any preventable clinical risk or adverse event.

Table 40: Mode of birth of term inborn admissions to neonatal nurseries (without known congenital abnormality) (2006)

Criteria	N	%
No. spontaneous vaginal births >36 weeks gestation	2991	
No. spontaneous vaginal births >36 weeks gestation admitted	122	4%
No. forceps births >36 weeks gestation	265	
No. forceps births >36 weeks gestation admitted	22	8%
No. vacuum extraction births >36 weeks gestation	526	
No. vacuum extraction births >36 weeks gestation admitted	36	7%
No. elective caesarean section births >36 weeks gestation	581	
elective caesarean section births >36 weeks gestation admitted	37	6%
No. emergency caesarean section births >36 weeks gestation	951	
No. emergency caesarean section births >36 weeks gestation admitted	99	10%

Data source: CLARA, patient record and Cartwright

Standard primipara

A woman who is 20 to 34 years of age, giving birth for the first time, who is free of obstetric and specific medical complications and pregnant with a singleton pregnancy at term (37^0 to 41^6 weeks gestation), with a non-small for gestational age (greater than the tenth percentile) infant and a cephalic presentation.

Perinatal Emergency Referral Service

Perinatal Emergency Referral Service (PERS) is a statewide service and commenced operation late in 2005 which has a coordinating role in arranging emergency perinatal transfers and accessing clinical advice about perinatal emergencies. Using sophisticated teleconference facilities, the service provides 24/7 access to consultant obstetric advice, and receives just over 1200 calls per annum from clinicians (midwives, GP-obstetricians, junior medical staff and obstetricians) in both public and private maternity services across the state. The majority of calls are in relation to preterm pregnancy complications, but referrals are also received arising from hypertensive complications, antepartum and postpartum bleeding and maternal medical problems.

Around 80% of calls lead to a decision to transfer the mother between hospitals, and although we are not a retrieval service, we assist that process by negotiating on behalf of the referring clinician with the potential receiving hospitals, and securing allocation of a bed. Most of the remaining calls are for 'advice only', but in a small number it becomes clear that delivery of an at-risk neonate is imminent and safe transfer cannot be effected. We then liaise with the Newborn Emergency Transport Service retrieval team to support the clinician on-site.

The PERS website (www.pers.org.au) is a rich source of clinical information, especially for smaller and more isolated units, and includes a set of guidelines (agreed between the three Melbourne tertiary units) for management of the commoner obstetric emergencies. There are also links into the Women's clinical practice guidelines, and a variety of other clinical and educational resources.

Newborn Emergency Transport Service

Newborn Emergency Transport Service (NETS) key objective is to provide safe, effective and efficient clinical services for critically ill babies. This mission underpins all NETS services – emergency and non-emergency clinical activities, education, information and communications technology, and statewide system planning and monitoring activities.

NETS now co-exists with the Perinatal Emergency Transport Service (PERS) in a relationship that is expected to lead to improved clinical services for the high risk pregnant woman and the fetus who may require in utero transfer.

Total patient transfers have increased from 2136 in 02/03 to 2301 in 05/06 with a peak of 2371 in 04/05. Demand for both emergency and non-emergency transfers increased by 9% and 8% respectively. The provision of a helicopter for NETS retrievals in 03/04 has provided enhanced flexibility and responsiveness. Together with the Metropolitan Ambulance Service, NETS have developed two purpose-modified emergency ambulances to ensure the transfer process is both safer and more effective for patients and staff. The Return Transport Service is now available seven days per week.

Clinical improvements

- End tidal CO2 monitoring for intubated babies is now routine.
- Inhaled nitric oxide therapy is now available for use during retrievals in-transport tidal volume monitoring system is now available for all babies requiring respiratory support.
- An in-transport phototherapy unit was introduced in 2005.
- The percentage of retrievals where the doctor is directly employed by NETS increased from 10% in 2000 to 78% in 2006.
- NETS consultants are present during retrievals of most babies weighing<1000g who are born outside a tertiary centre.
- All retrievals are reviewed by NETS senior medical and nursing staff.

Perinatal Mortality Report

We acknowledge the following contributors to this section and thank them for their contribution and partnership in producing this report.

Perinatal Review	**Contributors**
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Perinatal Mortality Report

All perinatal deaths are reviewed by the multidisciplinary Perinatal Mortality Review Committee, which was re-established in its new format in 2003. The Committee reports to the Women's Quality and Safety Committee.

All perinatal deaths of inborn infants are reviewed, as per the Australian standard definition, i.e. infants from gestations of twenty weeks or more, or if the gestation is uncertain, of birthweight 400g or more, who are either stillborn or who die in the first twenty eight days of life. Deaths are classified according to guidelines of the Perinatal Society of Australia and New Zealand (PSANZ). The Committee considers in each case opportunity for improvements in care and documents the quality assurance measures implemented in order to reduce the risk of recurrence of any identified practice deficiency.

Perinatal deaths

Table 1: Perinatal deaths and mortality rates

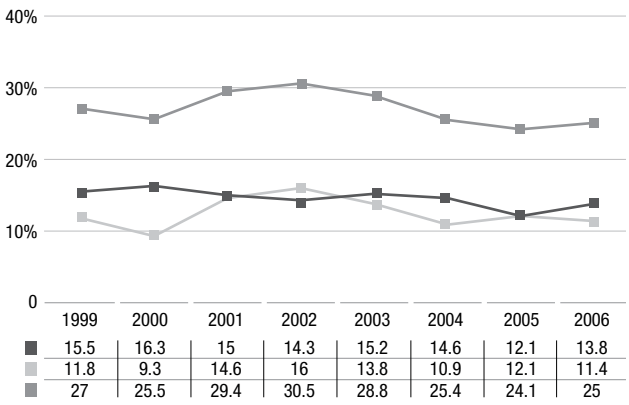
	1999	2000	2001	2002	2003	2004	2005	2006
					Number			
Livebirths	5,349	5,245	4,919	4,758	4,929	5,390	5,932	5,984
Total births	5,433	5,332	4,994	4,827	5,005	5,470	6,005	6,068
Stillbirths	84	87	75	69	76	80	73	84
Neonatal deaths	63	49	72	76	68	59	72	68
Perinatal deaths	147	136	147	145	144	139	145	152
					Rates per 1,000 births *			
Stillbirth rate	15.5	16.3	15.0	14.3	15.2	14.6	12.1	13.8
Neonatal mortality rate	11.8	9.3	14.6	16.0	13.8	10.9	12.1	11.4
Perinatal mortality rate	27.0	25.5	29.4	30.5	28.8	25.4	24.1	25.0

Data source: RWH 1999-2003 Consultative Council on Obstetric & Paediatric Mortality & Morbidity (CCOPMM); RWH 2004-2006 RWH Perinatal Review Committee

** Stillbirth and perinatal death rates were calculated using total births (livebirths and stillbirths) as the denominator*
Neonatal death rates were calculated using total live births as the denominator

Note Frances Perry Hospital (co-located private hospital) births and deaths were included in RWH data for 1999 and 2000 (source VPDCU)

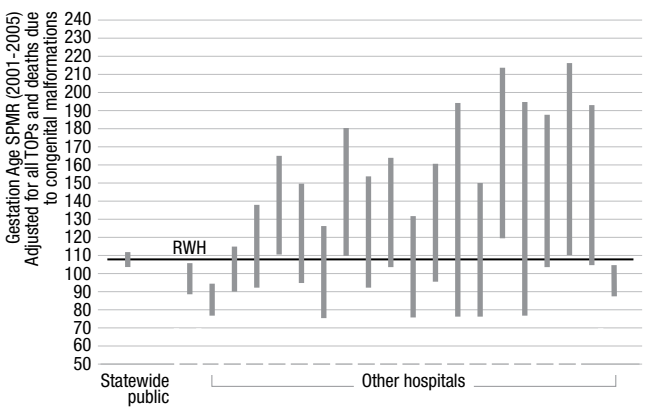
Figure 1: Perinatal mortality rates



Data source: RWH 1999-2003 Consultative Council on Obstetric & Paediatric Mortality & Morbidity (CCOPMM); RWH 2004-2006 RWH Perinatal Mortality Review Commitee

Crude perinatal mortality rates in the context of a tertiary referral institution are of limited utility as indicators of quality of care, in particular because of the impact of high rates of referrals of preterm infants and those with antenatally diagnosed anomalies. For this reason, adjusted rates (i.e. adjusted for gestational age and for congenital malformations) are presented below. The Women's can be seen to have an overall lower rate than the state average, reflecting relatively low rates of stillbirth and neonatal death at the Women's.

Figure 2: Gestation standardised perinatal mortality ratios Victorian Hospitals 2001-2005



Data source: DHS Victorian Maternity Services Performance Indicators Report March 2007

Perinatal deaths by PSANZ PDC and type

The following tables represent two different time periods, in order to identify any significant changes in proportions which may have arisen from changing referral patterns, particularly with respect to congenital malformations and spontaneous preterm birth. The hospital started using its own perinatal mortality database in 2004.

The increase in the category 'specific perinatal conditions' is as a result of increasing referrals of monochorionic multiple pregnancies, with the deaths being ascribed to twin/twin transfusion syndrome. Otherwise there has been little proportional change in the categories contributing to perinatal deaths.

Table 2: Perinatal deaths, 1999-2003, by cause (PSANZ PDC major categories) and type

	Type of perinatal death								
	Stillbirths (Fetal death)			Neonatal death			Total		
	n	%	Rate [b]	n	%	Rate [b]	n	%	Rate [b]
Congenital abnormality [a]	179	45.8	7.0	158	48.2	6.3	337	46.9	13.2
Infection	9	2.3	0.4	5	1.5	0.2	14	1.9	0.5
Hypertension	13	3.3	0.5	8	2.4	0.3	21	2.9	0.8
Antepartum haemorrhage	22	5.6	0.9	16	4.9	0.6	38	5.3	1.5
Maternal conditions	20	5.1	0.8	5	1.5	0.2	25	3.5	1.0
Specific perinatal conditions	29	7.4	1.1	20	6.1	0.8	49	6.8	1.9
Hypoxic peripartum death	4	1.0	0.2	5	1.5	0.2	9	1.3	0.4
Fetal growth restriction (FGR)	27	6.9	1.1	1	0.3	<0.1	28	3.9	1.1
Spontaneous preterm	37	9.5	1.4	103	31.4	4.1	140	19.5	5.4
Unexplained antepartum death	51	13.0	2.0	–	–	–	51	7.1	2.0
No obstetric antecedent	–	–	–	7	2.1	0.3	7	1.0	0.3
Total	391	100.0	15.3	328	100.0	13.0	719	100.0	28.1

Data source: RWH 1999-2003 Consultative Council on Obstetric & Paediatric Mortality & Morbidity (CCOPMM)
[a] Congenital abnormality includes terminations ≥20 wks
[b] Stillbirth and perinatal death rates were calculated using all births (livebirths and stillbirths). Neonatal death rates were calculated using all live births

Table 3: Perinatal deaths, 2004-2006, by cause (PSANZ PDC major categories) and type

	Type of perinatal death								
	Stillbirths (Fetal death)			Neonatal death			Total		
	n	%	Rate b	n	%	Rate b	n	%	Rate b
Congenital abnormality [a]	97	41.1	5.5	109	54.5	6.2	206	47.2	11.7
Infection	11	4.7	0.6	4	2	0.2	15	3.4	0.8
Hypertension	9	3.8	0.5	7	3.5	0.5	16	3.7	0.9
Antepartum haemorrhage	19	8.1	1.1	7	3.5	0.5	26	6.0	1.5
Maternal conditions	4	1.7	0.2	2	1	0.1	6	1.4	0.3
Specific perinatal conditions	24	10.2	1.4	20	10	1.2	44	10.1	2.5
Hypoxic peripartum death	4	1.3	0.2	1	1	0.2	5	1.1	0.3
Fetal growth restriction (FGR)	17	7.2	1	3	1.5	0.2	20	4.6	1.1
Spontaneous preterm	32	13.6	1.8	44	22	2.4	76	17.4	4.3
Unexplained antepartum death	20	8.5	1.1	–	–	–	20	4.6	1.1
No obstetric antecedent	–	–	–	2	1	0.1	2	0.5	0.1
Total	237	100.0	13.4	199	100	11.5	436	100.0	24.6

Data source: RWH perinatal mortality database
[a] Congenital abnormality includes terminations ≥20 wks
[b] Stillbirth and perinatal death rates were calculated using all births (livebirths and stillbirths). Neonatal death rates were calculated using all live births

Perinatal deaths by PSANZ PDC and gestational age

Table 4: Perinatal deaths, 1999-2003, by cause (PSANZ PDC) and gestational age

	Gestational age									
	20-27 weeks		28-31 weeks		32-36 weeks		37+ weeks		Total	
	n	%	n	%	n	%	n	%	n	%
Congenital abnormality [a]	248	48.3	16	34.0	33	48.5	40	44.0	337	46.9
Infection	12	2.3	–	–	–	–	2	2.2	14	1.9
Hypertension	15	2.9	2	4.3	1	1.5	3	3.3	21	2.9
Antepartum haemorrhage	28	5.5	2	4.3	7	10.3	1	1.1	38	5.3
Maternal conditions	17	3.3	2	4.3	2	2.9	4	4.4	25	3.5
Specific perinatal conditions	32	6.2	7	14.9	5	7.3	5	5.5	49	6.8
Hypoxic peripartum death	–	–	1	2.1	2	2.9	6	6.6	9	1.3
Fetal growth restriction	13	2.5	3	6.4	7	10.3	5	5.5	28	3.9
Spontaneous preterm	132	25.7	7	14.9	1	1.5	–	–	140	19.5
Unexplained antepartum death	16	3.1	7	14.9	10	14.7	18	19.8	51	7.1
No obstetric antecedent	–	–	–	–	–	–	7	7.7	7	1.0
Total	513	100.0	47	100.0	68	100.0	91	100.0	719	100.0

Data source: RWH 1999-2003 Consultative Council on Obstetric & Paediatric Mortality & Morbidity (CCOPMM)
[a] Congenital abnormality includes terminations ≥20 wks

Table 5: Perinatal deaths, 2004-2006, by cause (PSANZ PDC) and gestational age

	Gestational age									
	20-27 weeks		28-31 weeks		32-36 weeks		37+ weeks		Total	
	n	%	n	%	n	%	n	%	n	%
Congenital abnormality [a]	159	50.3	10	33.3	24	46.2	13	34.2	206	47.2
Infection	9	2.8	2	6.7	3	5.8	1	2.6	15	3.4
Hypertension	11	3.5	2	6.7	2	3.8	1	2.6	16	3.7
Antepartum haemorrhage	20	6.3	1	3.3	5	9.6	–	–	26	6.0
Maternal conditions	5	1.6	-	–	1	1.9	–	–	6	1.4
Specific perinatal conditions	28	8.9	6	20.0	7	13.5	3	7.9	44	10.1
Hypoxic peripartum death	–	–	–	–	1	3.8	4	7.9	5	1.1
Fetal growth restriction	9	2.8	1	3.3	5	9.6	5	13.2	20	4.6
Spontaneous preterm	70	22.2	6	20.0	–	–	–	–	76	17.4
Unexplained antepartum death	5	1.6	2	6.7	3	5.8	10	26.3	20	4.6
No obstetric antecedent	–	–	–	–	–	–	2	5.3	2	0.5
Total	316	100	30	100	51	100	39	100.0	436	100

Data source: RWH perinatal mortality database
[a] Congenital abnormality includes terminations ≥20 wks

These two tables enable an assessment of the impact on perinatal mortality in a referral institution, as a result of infants being born prior to term. Approximately 90 % of perinatal deaths at the Women's occur in the approximately 15% of infants born preterm. This of course applies equally to morbidity. It also reflects the focus of the workload of perinatal staff on preterm birth, for obstetricians, midwives, neonatologists, neonatal nurses and trainees, anaesthetists, physicians, pathologists, bereavement counsellors and other allied health professionals and trainees, as a result of The Women's being a referral centre for care for this very vulnerable population.

Stillbirths by PSANZ PDC and gestational age

The following four tables present the same data and classifications but in the separate moieties of stillbirth and neonatal death. Because the numbers in individual categories are small, caution should apply in interpreting any apparent differences.

Table 6: Stillbirths, 1999-2003, by cause (PSANZ PDC) and gestational age

	Gestational age									
	20-27 weeks		28-31 weeks		32-36 weeks		37+ weeks		Total	
	n	%	n	%	n	%	n	%	n	%
Congenital abnormality [a]	154	55.0	9	31.0	9	22.5	7	16.7	179	45.8
Infection	7	2.5	–	–	–	–	2	2.3	9	2.3
Hypertension	10	3.6	1	3.4	1	2.5	1	3.3	13	3.3
Antepartum haemorrhage	15	5.4	1	3.4	5	12.5	1	5.6	22	5.6
Maternal conditions	13	4.6	2	6.9	2	5.0	3	5.1	20	5.1
Specific perinatal conditions	17	6.1	4	13.8	5	12.5	3	7.4	29	7.4
Hypoxic peripartum death	–	–	1	3.4	1	2.5	2	1.0	4	1.0
Fetal growth restriction	13	4.6	2	6.9	7	17.5	5	6.9	27	6.9
Spontaneous preterm	35	12.5	2	6.9	–	–	–	9.5	37	9.5
Unexplained antepartum death	16	5.7	7	24.1	10	25.0	18	13.0	51	13.0
No obstetric antecedent	–	–	–	–	–	–	–	–	–	–
Total	280	100.0	29	100.0	40	100.0	42	100.0	391	100.0

Data source: RWH 1999-2003 Consultative Council on Obstetric & Paediatric Mortality & Morbidity (CCOPMM)
[a] Congenital abnormality includes terminations ≥20 weeks

Table 7: Stillbirths, 2004-2006, by cause (PSANZ PDC) and gestational age

	Gestational age									
	20-27 weeks		28-31 weeks		32-36 weeks		37+ weeks		Total	
	n	%	n	%	n	%	n	%	n	%
Congenital abnormality [a]	83	50.0	6	33.3	6	21.4	2	8.3	97	41.1
Infection	5	3.0	2	11.1	3	10.7	1	4.2	11	4.7
Hypertension	6	3.6	1	5.6	1	3.6	1	4.2	9	3.8
Antepartum haemorrhage	14	8.4	–	–	5	17.9	–	–	19	8.1
Maternal conditions	3	1.8	–	–	1	3.6	–	–	4	1.7
Specific perinatal conditions	14	8.4	4	22.2	3	10.7	3	12.5	24	10.2
Hypoxic peripartum death	–	–	–	–	1	3.6	3	8.3	4	1.7
Fetal growth restriction	6	3.6	1	5.6	5	17.9	5	20.8	17	7.2
Spontaneous preterm	30	18.1	2	11.1	–	–	–	–	32	13.6
Unexplained antepartum death	5	3.0	2	11.1	3	10.7	10	41.7	20	8.5
No obstetric antecedent	–	–	–	–	–	–	–	–	–	–
Total	166	100	18	100	28	100.0	25	100	237	100

Data source: RWH perinatal mortality database
[a] Congenital abnormality includes terminations ≥20 weeks

Neonatal deaths by PSANZ PDC and gestational age

Table 8: Neonatal deaths, 1999-2003, by cause (PSANZ PDC) and gestational age

	Gestational age									
	20-27 weeks		28-31 weeks		32-36 weeks		37+ weeks		Total	
	n	%	n	%	n	%	n	%	n	%
Congenital abnormality [a]	94	40.3	7	38.9	24	85.7	33	67.4	158	48.2
Infection	5	2.1	–	–	–	–	–	–	5	1.5
Hypertension	5	2.1	1	5.5	–	–	2	4.1	8	2.4
Antepartum haemorrhage	13	5.6	1	5.5	2	8.3	–	–	16	4.9
Maternal conditions	4	1.7	–	–	–	–	1	2.0	5	1.5
Specific perinatal conditions	15	6.4	3	16.7	–	–	2	4.1	20	6.1
Hypoxic peripartum death	–	–	–	–	1	3.6	4	8.2	5	1.5
Fetal growth restriction	–	–	1	5.5	-	-	–	–	1	0.3
Spontaneous preterm	97	41.6	5	27.8	1	3.6	–	–	103	31.4
Unexplained antepartum death	–	–	–	–	–	–	–	–	–	–
No obstetric antecedent	–	–	–	–	–	–	7	14.3	7	2.1
Total	233	100.0	18	100.0	28	100.0	49	100.0	328	100.0

Data source: RWH 1999-2003 Consultative Council on Obstetric & Paediatric Mortality & Morbidity (CCOPMM)
[a] Congenital abnormality includes terminations ≥20 wks

Table 9: Neonatal deaths, 2004-2006, by cause (PSANZ PDC) and gestational age

	Gestational age									
	20-27 weeks		28-31 weeks		32-36 weeks		37+ weeks		Total	
	n	%	n	%	n	%	n	%	n	%
Congenital abnormality [a]	75	50.6	4	31.0	19	76.0	11	78.6	109	54.5
Infection	4	2.7	–	–	–	–	–	–	4	2.0
Hypertension	5	3.3	1	7.6	1	4.0	–	–	7	3.5
Antepartum haemorrhage	6	4.0	1	7.6	–	–	–	–	7	3.5
Maternal conditions	2	1.4	–	–	–	–	–	–	2	1.0
Specific perinatal conditions	14	9.5	2	15.3	4	16.0	–	–	20	10.0
Hypoxic peripartum death	–	–	–	–	0	–	1	7.1	1	0.5
Fetal growth restriction	2	1.4	1	7.6	–	–	–	–	3	1.5
Spontaneous preterm	40	27.0	4	31.0	–	–	–	–	44	22.0
Unexplained antepartum death	–	–	–	–	–	–	–	–	–	–
No obstetric antecedent	–	–	–	–	–	–	2	14.3	2	1.0
Total	148	100.0	13	100.0	24	100.0	14	100	199	100.0

Data source: RWH perinatal mortality database
[a] Congenital abnormality includes terminations ≥20 wks

Perinatal autopsy

Table 10: Perinatal autopsy rates 2004-2006

	2004			2005			2006		
	Fetal	Neonatal	Total	Fetal	Neonatal	Total	Fetal	Neonatal	Total
Yes	42	29	71	46	22	68	41	21	62
Total	80	59	139	72	73	145	84	68	152
Autopsy rate %	52.5	49.2		63.9	30.1		48.8	30.9	
Perinatal autopsy rate %			51.1			46.9			40.8

Data source: RWH perinatal mortality database

The committee has the benefit of input from a tertiary perinatal pathologist for all cases even when there has been no autopsy. This is invaluable in undertaking a sophisticated consideration of the likely cause of fetal or neonatal death.

Neonatal Services

We acknowledge the following contributors to this section and thank them for their contribution and partnership in producing this report.

Service area	Contributors
Director of Nurseries	Dr Sue Jacobs
Neonatal consultant	Dr Sheryle Rogerson
Director (Medical) Neonatal Services	Dr Neil Roy
Professor/Director of Neonatal Medicine	Professor Colin Morley
Program Manager, Neonatal Services	Ms Kathy Marshall
Director (Nursing) of Neonatal Services	Ms Cvetka Sedmak

Neonatal Services

Neonatal Services at the Women's provides statewide care, and when necessary accepts neonates from interstate and from the Asia Pacific area. Over the years comprising this report, the number of cots has increased such that the usual operating capacity is now 18 respiratory support cots, which is flexed up to 20 cots depending on demand. There are 34 special care cots.

Neonatal Services is committed to the provision of evidence based care. The research performed at the Women's, which includes national and international collaboration as well as the synthesis of evidence into systematic reviews within the Cochrane Collaboration, is highly regarded and has had worldwide impact and recognition.

In addition, we practice within a philosophy of family-centred developmentally supportive care such that a 'Family Care Plan' has been implemented and neurodevelopmental specialists (Neonatal Neurologist, Neonatal Physiotherapist, Neonatal Occupational Therapist and Paediatric Speech pathologist) are an integral part of the multidisciplinary care team.

This neonatal report documents care from 2002 onwards when the Cartwright database was established.

Dr Sue Jacobs
Director of Nurseries

Clinical Practice Research

The impact of research on clinical practice at the Women's includes:

- Caffeine is used to reduce apnoea of prematurity, duration of ventilation and chronic lung disease without any significant increase in short or long-term adverse effects [Caffeine for Apnoea of Prematurity (CAP) trial[1]]. Caffeine is the preferred treatment for apnoea of prematurity because of the wide margin of therapeutic safety.
- Blood cell transfusion of preterm infants has been safely reduced by adopting a lower hemoglobin threshold for transfusion strategy [Premature Infants in Need of Transfusion (PINT) trial[2]].
- Many very preterm infants can be managed from birth with nasal CPAP and do not require intubation and ventilation [CPAP or Intubation for very premature infants (COIN) trial[3]].
- Volume targeted ventilation is the ventilation mode of choice as it optimises the tidal volume, reduces the ventilation pressure and the duration of ventilation (Cochrane Review[4]).
- The spontaneous breathing test developed at the Women's is used to determine when babies are ready for extubation[5].
- All babies are now initially resuscitated in air rather than oxygen to reduce oxygen damage.[6] Also, the babies' oxygen saturation and heart rate are carefully and continuously monitored from birth using techniques developed at the Women's (Cochrane Review[7]; Resuscitation studies[8, 9,10]).
- The oxygen saturation targets of very premature babies have been lowered due to concerns about oxygen toxicity on the eye, lung and brain. The optimal oxygen saturation target is being investigated as part of an international study [Benefit of Oxygen Saturation Target (BOOST) trial].
- A low-dose dexamethasone regime is used to facilitate extubation and to shorten the duration of ventilation in very preterm ventilator-dependent infants when necessary without significant short-term complications [Dexamethasone: A Randomised Trial (DART)[11]]. The longer term neurodevelopmental effects are not certain.

[1] *Schmidt B, Roberts RS, Davis P, Doyle L et al. Caffeine for apnoea of prematurity. N Engl J Med 2006;354: 2112-21*

[2] *Kirpalani H, Whyte RK, Andersen C, Asztalos EV et al. The premature infants in nned of transfusion (pint) study: A randomized controlled trial of a restrictive (LOW) versus liberal (HIGH) transfusion threshold for extremely low birth weight infants. J Pediatr 2006;149:301-7*

[3] *Morley CJ, Davis PG, Doyle LW, Brion LP, Hascoet JM, Carlin JB. Nasal CPAP or intubation for very preterm infants at birth: the COIN trial. (Submitted for publication)*

[4] *McCallion N, Davis PG, Morley CJ. Volume-targeted versus pressure-limited ventilation in the neonate. Cochrane Database of Systematic Reviews 2005, Issue 3. Art. No.: CD003666. DOI: 10.1002/14651858.CD003666.pub2*

[5] *Kamlin CO. Davis PG. Morley CJ. Predicting successful extubation of very low birthweight infants. Archives of Disease in Childhood Fetal & Neonatal Edition 2006;91:F180-3*

[6] *Davis PG. Tan A. O'Donnell CP. Schulze A. Resuscitation of newborn infants with 100% oxygen or air: a systematic review and meta-analysis. Lancet 2004;364:1329-33*

Admissions to neonatal nurseries

Neonatal unit admissions have increased over the duration of this report, the greatest contributor being the number of babies admitted to Neonatal Intensive Care. This has increased by 55/year (5%) from 2002 to 2006.

Table 1: Admissions to NICU and SCN

	2002		2003		2004		2005		2006	
	no	%	no	%	no	%	no	%	no	%
NICU	435	38.5	459	36.0	492	39.7	495	39.8	490	40.0
SCN only	696	61.5	815	64.0	747	60.3	750	60.2	735	60.0
Babies admitted	1131		1274		1239		1245		1225	

Data source: Cartwright

Additionally, there are babies re-admitted after discharge or transfer from Neonatal Intensive Care / Special Care, and babies admitted for observation for 4 hours or less.

Table 2: Numbers of readmissions and infants admitted less than 4 hours

	2002	2003	2004	2005	2006
Readmissions and babies admitted less than 4 hours	350	333	336	384	344
Total admissions	1481	1607	1575	1629	1569

Data source: Cartwright

The number of babies born outside the Women's and admitted to the Women's has remained stable between 17-20%. Outborn babies are admitted from the co-located private hospital, Frances Perry House and via the Newborn Emergency Transport Service.

Table 3: Admissions to nurseries by location of birth

	2002		2003		2004		2005		2006	
	no	%	no	%	no	%	no	%	no	%
At RWH	902	79.8	1053	82.7	1015	81.9	1019	81.8	995	81.2
Out born	229	20.2	221	17.3	224	18.1	226	18.2	230	18.8
Total	1131		1274		1239		1245		1225	

Data source: Cartwright

Admissions related to multiple birth

The number of babies admitted from multiple births has remained stable at around 10%.

Table 4: Admissions related to multiple births

	2002	2003	2004	2005	2006
Singleton	1019	1163	1116	1151	1102
Twins	104	103	116	88	109
Triplets	8	7	7	6	11
Quads	0	1	0	0	3
Total	1131	1274	1239	1245	1225
% multiple birth	9.9	8.7	9.9	7.6	10.0

Data source: Cartwright

Admissions related to congenital abnormalities

The number of babies with congenital abnormalities has increased from 8% in 2002 to 12% in 2006. This has been contributed to by both the establishment and growth of the Fetal Management Unit, and by the number of interstate referrals for management of hypoplastic left heart syndrome.

Table 5: Babies admitted to nurseries with congenital abnormalities

	2002	2003	2004	2005	2006
Number of babies	90	79	110	157	143
%	8.0	6.2	8.9	12.6	11.7

Data source: Cartwright

[7] *Tan A, Schulze A, O'Donnell CPF, Davis PG. Air versus oxygen for resuscitation of infants at birth. Cochrane Database of Systematic Reviews 2005, Issue 2. Art. No.: CD002273. DOI: 10.1002/14651858.CD002273.pub3*

[8] *Dawson JA. Davis PG. O'Donnell CP. Kamlin CO. Morley CJ. Pulse oximetry for monitoring infants in the delivery room: a review. Archives of Disease in Childhood Fetal & Neonatal Edition 2007;92:F4-7*

[9] *Kamlin CO. O'Donnell CP. Everest NJ. Davis PG. Morley CJ. Accuracy of clinical assessment of infant heart rate in the delivery room. Resuscitation 2006;71:319-21*

[10] *Kamlin CO. O'Donnell CP. Davis PG. Morley CJ. Oxygen saturation in healthy infants immediately after birth. Journal of Pediatrics 2006;148:585-9*

[11] *Doyle LW, Davis PG, Morley CJ, McPhee A, Carlin JB. Low-dose dexamethasone facilitates extubation among chronically ventilator-dependent infants: A multicenter, international, randomized, controlled trial. Pediatrics 2006;117:75-83*

Admissions by gestation and birthweight

Table 6: Admission by gestational age

	2002		2003		2004		2005		2006	
weeks	no	%	no	%	no	%	no	%	no	%
22	0	0	0	0.0	0	0	1	0.1	2	0.2
23	3	0.3	4	0.3	3	0.3	6	0.5	1	0.1
24	16	1.5	7	0.6	18	1.5	18	1.5	21	1.8
25	16	1.5	21	1.8	24	2.0	21	1.8	27	2.3
26	27	2.5	23	2.0	12	1.0	28	2.3	23	1.9
27	42	3.9	33	2.8	36	3.1	25	2.1	22	1.8
28	36	3.3	35	3.0	31	2.6	31	2.6	37	3.1
29	36	3.3	45	3.9	44	3.7	38	3.2	44	3.7
30	30	2.8	60	5.2	51	4.3	42	3.5	47	3.9
31	65	6.0	55	4.7	71	6.0	58	4.8	60	5.0
32	92	8.5	58	5.0	59	5.0	64	5.3	82	6.9
33	75	7.0	97	8.4	69	5.9	71	5.9	81	6.8
34	78	7.2	78	6.7	86	7.3	86	7.2	83	7.0
35	75	7.0	86	7.4	88	7.5	95	7.9	92	7.7
36	64	5.9	82	7.1	86	7.3	93	7.8	77	6.5
37	70	6.5	81	7.0	95	8.1	97	8.1	79	6.6
38	119	11.0	111	9.6	124	10.6	136	11.4	125	10.5
39	68	6.3	98	8.5	89	7%	92	7.7	89	7. %
40	114	10.6	120	10.4	105	8.9	111	9.3	102	8.6
≥41	51	4.7	64	5.5	83	7.1	85	7.1	98	8.2

Data source: Cartwright

Table 7: Admission by birth weight

	2002		2003		2004		2005		2006	
grams	no	%	no	%	no	%	no	%	no	%
<=499	2	0.2	2	0.2	3	0.3	1	0.1	7	0.6
500 - 749	40	3.7	33	2.8	36	3.1	47	3.9	35	2.9
750-999	63	5.8	60	5.2	53	4.5	60	5.0	58	4.9
1000-1249	66	6.1	77	6.6	68	5.8	56	4.7	67	5.6
1249-1499	85	7.9	75	6.5	80	6.8	57	4.8	83	7.0
1500-1999	160	14.9	178	15.4	177	15.1	180	15.0	195	16.3
2000 - 2499	196	18.2	202	17.4	205	17.5	210	17.5	190	15.9
2500 - 2999	142	13.2	185	16.0	182	15.5	169	14.1	154	12.9
3000-3499	155	14.4	155	13.4	158	13.5	176	14.7	190	15.9
3500-3999	105	9.7	125	10.8	133	11.3	157	13.1	139	11.7
> 4000	63	5.8	66	5.7	79	6.7	85	7.1	75	6.3

Data source: Cartwright

Survival of babies by gestation and birth weight

Whenever possible the paediatric team provides antenatal counseling to all women and families considered at risk of preterm delivery, and those anticipating an infant with serious morbidity or congenital anomalies. This includes verbal and written information. Parents receive a booklet *Anticipating the Birth of an Extremely Premature Baby* (Victorian Department of Human Services) and the Women's specific data on survival as well as short and long-term morbidity at 23-32 weeks gestation. There is an opportunity to meet with a Neonatal Care Manager and visit our Neonatal Intensive and Special Care. Parents are involved in all decision making at the margins of viability and in decisions to withdraw intensive care support.

Resuscitation of babies below 23 weeks gestation is not usual as survival is so poor and the risk of long-term morbidity so high. At 23 weeks, we counsel against active treatment and at 24 weeks the possibility of not initiating treatment is discussed. Active treatment is initiated for all infants at 25 weeks and above. These recommendations are in keeping with national (NSW and ACT consensus statement, 2006[12]) and international practices (Ethical guidelines on resuscitation of newborns – International Federation of Gynecology and Obstetrics 2006[13]).

The Women's and Victorian neonatal services are amongst world leaders in survival and long-term neurodevelopmental outcomes of extremely preterm infants. The Victorian Infant Collaborative Study[14,15] (VICS) continues to report on the outcomes of extremely low birth weight (ELBW) infants delivered in Victoria in 1979-1981, 1991-1992, and 1997. Survival and quality-adjusted survival to 2 years have improved significantly over this time, mostly in the smallest infants as well as those 'inborn' in tertiary perinatal centres, and with relative stability in efficiency in terms of costs and resource utilisation. However, ELBW infants still have higher rates of neurosensory impairments and disabilities at 14 years of age[16] which may be reliably predicted from the 2 year assessment. Respiratory function compared with normal birthweight infants is compromised in mid-childhood[17], particularly in those who had bronchpulmonary dysplasia in the neonatal period.

This is further adversely affected by smoking[18] in early adulthood. Blood pressure is significantly higher in late adolescence following very preterm birth.

The aim of the Victorian Infant Brain (VIBeS) study is to improve understanding of the developing vulnerable newborn brain[19] using state-of-the-art neuroimaging and cerebral monitoring modalities. MRI differences in preterm brain development[20] are associated with neurocognitive outcomes in early childhood, particularly in the hippocampus and cerebellum. Our improved understanding of altered preterm brain development has formed the basis of early intervention studies, including optimising parental involvement during hospitalisation (Premie Start Beautiful Beginnings study) and intensive early neurodevelopmental interventions following discharge[21]. VIBeS has refined and developed the utility of bedside cerebral function monitoring, particularly in the near-term population with encephalopathy.[22]

Table 8: Survival by gestational age

	2002		2003		2004		2005		2006	
weeks	**no**	**%**	**no**	**%**	**no**	**%**	**no**	**%**	**no**	**%**
22	na	na	na	na	na	na	na	na	na	na
23	1	33%	3	75%	2	67%	3	50%	1	100%
24	7	43%	5	71%	13	72%	10	53%	13	62%
25	14	87%	19	90%	19	79%	14	70%	20	74%
26	23	85%	17	73%	11	92%	24	86%	21	91%
27	39	92%	30	90%	35	97%	23	92%	21	95%
28	35	97%	34	97%	28	90%	29	94%	37	100%
29	36	100%	42	93%	42	96%	34	90%	43	97%
30	30	100%	60	100%	51	100%	41	97%	47	100%
31	63	95%	55	100%	71	100%	56	97%	60	100%
32	92	100%	56	96%	58	99%	61	95%	81	99%
33	74	98%	94	97%	68	99%	69	97%	81	100%
34	77	98%	78	100%	86	100%	82	95%	82	99%
35	74	98%	85	99%	86	98%	94	98%	91	99%
36	64	100%	81	99%	82	95%	92	98%	75	97%
37	69	98%	81	100%	95	100%	94	97%	77	97%
38	119	100%	111	100%	124	100%	135	99%	124	99%
39	67	98%	97	99%	89	100%	92	100%	88	99%
40	113	99%	119	99%	104	99%	108	97%	101	99%
>41	51	81%	62	97%	82	99%	84	99%	98	100%
total	1048	97	1129	97	1146	98	1145	96	1161	97

Data source: Cartwright

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Table 9: Survival by birth weight

	2002		2003		2004		2005		2006	
grams	no	%	no	%	no	%	no	%	no	%
< = 499	0	0%	1	50%	2	66%	0	0%	5	71%
500 - 749	27	67%	25	75%	28	77%	28	60%	24	68%
750-999	57	90%	58	96%	47	88%	54	90%	53	91%
1000-1249	65	98%	72	93%	65	95%	53	94%	65	97%
1249-1499	85	100%	72	96%	79	98%	54	94%	73	100%
1500-1999	160	100%	175	98%	175	98%	175	97%	194	99%
2000 - 2499	194	98%	199	98%	203	99%	204	97%	186	97%
2500 - 2999	139	97%	155	100%	179	98%	164	97%	153	99%
3000-3499	155	100%	182	98%	157	99%	171	97%	187	98%
3500-3999	104	99%	124	99%	133	100%	157	100%	137	98%
> 4000	62	98%	66	100%	78	98%	85	100%	85	100%

Data source: Cartwright

Length of stay of babies who survive

Table 10: Length of stay for survivors by gestational age (mean days)

Weeks	2002	2003	2004	2005	2006
22	0	0	0	0	0
23	132	111	150	124	110
24	92	92	107	111	113
25	89	107	99	83	82
26	70	66	69	85	69
27	44	60	54	71	54
28	45	48	45	40	51
29	34	28	35	40	47
30	33	23	23	24	20
31	15	16	20	18	20
32	14	16	16	16	13
33	13	11	11	12	14
34	13	11	11	10	11
35	9	8	7	9	8
36	7	6	7	7	9
37	4	7	7	5	5
38	6	5	6	4	4
39	6	5	6	6	5
40	4	5	4	6	4
≥41	5	5	5	4	4

Data source: Cartwright

Table 11: Length of stay of survivors by birth weight (mean days)

grams	2002	2003	2004	2005	2006
< = 499	0	109	93	na	127
500-749	98	95	84	100	101
750-999	58	61	67	69	63
1000-1249	39	35	41	45	41
1250-1499	20	21	27	25	32
1500-1999	15	15	14	15	14
2000-2499	9	9	8	8	8
2500-2999	6	7	7	7	7
3000-3499	6	5	7	5	5
3500-3999	4	4	4	4	3
>=4000	5	5	5	4	4

Data source: Cartwright

40% of babies admitted to Neonatal Intensive Care / Special Care are discharged home from the Women's. The remainder are transferred to the Royal Children's Hospital for surgical or sub-specialist care or to regional level 1 and 2 centres for convalescent care.

Respiratory support

Like most other Neonatal Intensive Care Units the number of very preterm infants being treated with nasal CPAP only has increased.

Table 12: Assisted ventilation in NICU

	2002	2003	2004	2005	2006
IPPV +/- CPAP (n)	292	237	247	263	233
% NICU babies	67.1	51.6	50.2	53.1	47.6
CPAP only (n)	102	150	176	144	192
% NICU babies	14.7	18.4	23.6	19.2	26.1
Total receiving respiratory support (IPPV +/-CPAP) (n)	394	387	423	407	425
% NICU babies	90.5	84.3	86.0	82.2	86.7
% of babies admitted to neonatal nurseries	34.8	30.0	34.0	33.0	35.0

Data source: Cartwright

Table 13: Additional respiratory support in ventilated babies

	2002	2003	2004	2005	2006
Nitric oxide (n)	8	12	12	28	18
% NICU babies	2.0	3.1	2.8	6.9	4.2
HFOV (n)	56	36	47	50	37
% NICU babies	14.2	9.3	11.1	12.3	8.7

Data source: Cartwright

Table 14: Duration of respiratory support (IPPV +/- CPAP) by gestational age (median hours)

weeks	2002	2003	2004	2005	2006
<24	382	554	306	543	199
24-25	396	628	469	431	326
26-27	225	214	164	222	155
28-29	87	95	137	115	87
30-31	50	65	47	52	44
32-33	28	38	37	40	18
34-36	27	45	71	46	55
37-38	40	37	35	38	19
39-40	29	32	38	29	22
>41	32	64	80	79	52
Total median hours	130	159	95	150	120

Data source: Cartwright

ANZNN Clinical Indicators

Neonatal Services at the Women's contributes data to the Australian and New Zealand Neonatal Network (ANZNN) for all babies born at less than 32 completed weeks' gestation, or who weigh less than 1500 grams at birth, or who receive assisted ventilation for four or more consecutive hours, or who died while receiving mechanical ventilation prior to four hours of age.

Table 15: Results for key ANZNN indicators

	Benchmark	2002	2003	2004	2005	2006
Cranial ultrasound	More than 95%	97%	96%	96%	96.3%	98.7%
Intraventricular haemorrhage 1-4	Less than 45%	26%	30%	36%	23.3%	35.7%
Eye examination	More than 90%	94%	90%	94%	87.1%*	96.5%
Stage 3 and 4 Retinopathy of prematurity	Less than 8%	12.6%	13%	9%	7.5%	8.1%
Chronic lung disease –babies still needing assistance with breathing at 36 weeks	Less than 20%	22%	26%	32%	28%	12.5%**

Data source: Cartwright
**this rate reflects incomplete data*
*** data appears to be accurate although not predicted and further analysis is ongoing*

Infection

The Neonatal Infection Committee has implemented a number of strategies to minimise the incidence of late onset sepsis, diagnosed 48 hours or more after birth, with the associated increased mortality and morbidity in survivors. This has included multi-faceted collaborative educational programs to promote hand-hygiene eg the'Wash-Up' project, following the initiation of an alcoholic hand-gel into Neonatal Intensive Care / Special Care. Other initiatives have included the use of aqueous chlorhexidene for skin antisepsis prior to invasive procedures; development of evidence based antibiotic guidelines for antibiotics in nosocomial sepsis; oral anti-fungal prophlaxis for infants below 1000 grams at birth; an educational package regarding blood culture collection, immunisation guidelines for preterm infants. ProPrems, the NHMRC funded multi-centred placebo-controlled randomised controlled trial investigating the effect of probiotics on the incidence of late onset sepsis in very preterm infants is underway.

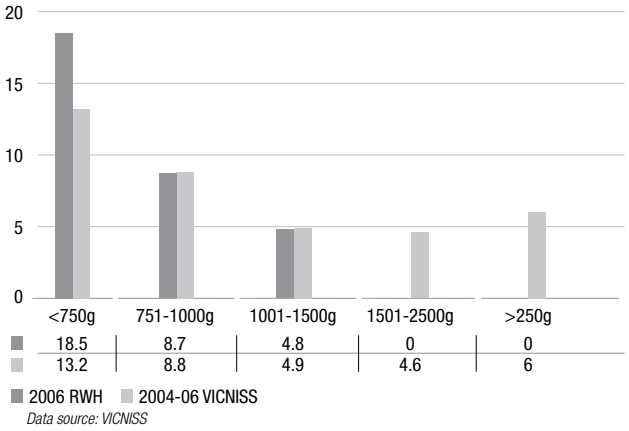
Benchmarking with similar neonatal centres within Victoria via the VICNISS (Victorian Nosocomial Infection Surveillance) program (see Infection Control section of report), and in Australia and New Zealand, through the ANZNN, and internationally reflects well.

Table 16: Rates of culture proven sepsis compared with ANZNN data

ANZNN	2004	2003	2004	2005	2006
<28 weeks	36.5	38.8	29.9	21	26
28-36 weeks	6.4	2.4	5.9	5	1.8
>36 weeks	5.4	0.35	1.6	0.1	0
Total ANZNN	10.3	na	6.8	6.3	6.4

Data source: Cartwright database with exclusion of contaminants (as per InfectionControl)

Figure 1: Neonatal line related bacteraemia rate per 1000 beddays



Data source: VICNISS

Women's Health

We acknowledge the following contributors to this section and thank them for their contribution and partnership in producing this report.

Service area	Contributors
Laparoscopy	Dr Martin Healey
Endometriosis	Dr Martin Healey
Hysterectomy	Dr Philip Thomas
Dysfunctional Uterine Bleeding	Associate Professor Leslie Reti
Endometrial Ablation	Associate Professor Leslie Reti
Ectopic Pregnancy	Dr Anne Poliness
Miscarriage	Dr Louise Kornman
Sterilisation	Dr Di Palmer
Urogynaecology and pelvic floor displacement service	Dr Marcus Carey
Oncology and Dysplasia Service	Professor Michael Quinn, Ms Margot Osinki, Ms Huda Ismail
Reproductive Services	Dr John McBain, Ms Caroline Mulcahy
Pregnancy Advisory Service	Ms Annarella Hardiman, Ms Chanel Keane, Dr Chris Bayly

Women's Health

The Women's Health Service incorporates general gynaecology, urogynaecology, oncology and dysplasia, reproductive and pregnancy advisory services. We believe it is the busiest service of its kind in Australia. In the 2006/07 financial year the service had 11,570 inpatient surgical and non-surgical separations. Increasing demand for these services coupled with increasing medical and social complexity in the women we see has been accompanied by service innovation, improved clinical governance and quality care.

Significant changes have occurred in this service since the last report with reorganisation of the general clinics and their adoption of special interests which has facilitated increased evidence based consistency of care. There has been more and more emphasis on laparoscopic management of surgical problems. Innovation has often developed faster than the ICD10-AM classification system resulting in difficulties gathering accurate and contemporary data on new procedures.

The maturation of preadmission clinics has provided an invaluable clinical risk strategy and final review of patients prior to their admission for surgery. This service allows an opportunity for updating pre-operative investigations and a final discussion with the patients about their procedure.

Some services are not yet represented in the report but will be in the next report. The Breast Service, Vulva Dermatology Clinic, Menopause Clinic, Sexual Counselling Clinic and Sexual Transmitted Disease Clinic are newly developing services or have very limited clinical data at this stage.

Associate Professor Leslie Reti
Clinical Head, Gynaecology 1

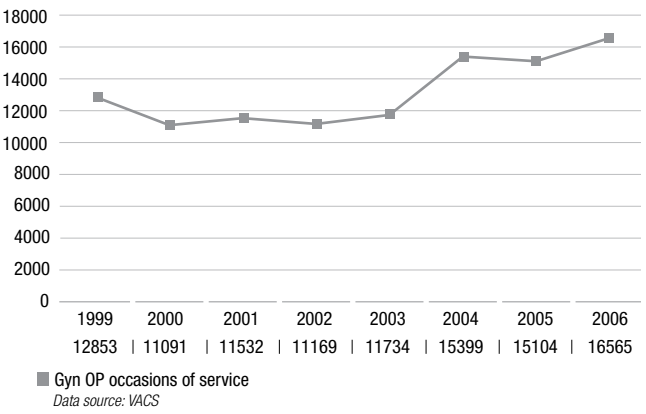
Ms Liz Chatham
Director, Women's Services

Gynaecology

The Women's reviews women pre-operatively in outpatients. A surgical pre-admission questionnaire is used to triage women to a pre-admission clinic (PAC). There are surgical PACs and anaesthetic PACs, some attending both. In some circumstances the operating consultants may see women as well. This is an important clinical risk mitigation strategy. With changing clinical circumstances while on the waiting list, many additional interventions and changes of management occur at the PAC to effect the best outcome for patients.

We have three general gynaecology units, formed in 2002, each with a specific focus. These units deal with clinical gynaecology issues not covered by the subspecialties of reproductive services, oncology and uro-gynaecology. Although they manage all gynaecology problems, unit 1 has a special interest in menstrual disorders, unit 2 in pelvic pain and endometriosis and unit 3 in pelvic displacements (prolapse).

Figure 1: Occasions of service in gynaecology outpatient clinics



Data source: VACS

Pre-admission clinic

Table 1: Pre-admission clinic attendance

1999	2000	2001	2002	2003	2004	2005	2006
9285	9085	9091	8358	7285	7236	7645	8549

Data source: VACS. Data includes surgical, anaesthetic and pregnancy pre-admission services

Table 2: Non O+G Specialist outpatient services occasions of service

	1999	2000	2001	2002	2003	2004	2005	2006
Physicians	1741	1548	1397	1246	1349	1290	1199	1241
Endocrinologists	1696	1749	1666	1789	1767	1605	1495	1586
Haematologists	1180	1431	1461	1392	1326	1149	867	790
Oncologists	2050	2146	2111	2068	1780	1823	1784	1868
Infectious Disease Physician	231	263	222	235	212	535	516	599

Data source: VACS. Data includes some maternity patients

Table 3: Admission by gynaecology unit

	1999	2000	2001	2002	2003	2004	2005	2006
Gynaecology 1	0	0	0	681	1742	1537	1863	2121
Gynaecology 2	0	0	0	637	1638	1750	2072	1962
Gynaecology 3	0	0	0	695	1891	1948	1869	1773
Choices Unit	1607	1494	1607	1771	1743	1738	1661	1855
Oncology	1140	1373	1140	1075	1412	1798	1928	1762
Reproductive Services	662	907	662	1801	1815	1972	2177	2146
Dysplasia	789	1115	789	835	934	797	767	712
Breast Unit	576	526	576	497	616	600	472	501
Urogynaecology	560	651	560	467	391	503	415	456
Recurrent Miscarriage	311	278	311	86	6	22	13	25
Other	5289	5065	5289	3074	117	90	28	7
Total	10934	11409	10934	11619	12305	12755	13265	13320

Data source: VAED

Laparoscopy

The last seven years has seen major changes in benign gynaecological surgery. There has been a steady reduction in the proportion of "minor" laparoscopic procedures for diagnostic purposes or sterilisation (49% in 2000 to 41% in 2006). During the same period the proportion of operative laparoscopies has risen from 51% to 59%.

Absolute numbers of laparoscopies performed has fallen from a peak in 2001. This may be partly explained by a trend towards performing increasingly complex laparoscopic procedures, with longer operating times. There has also been a trend towards performing "see and treat" laparoscopies, where in the past a diagnostic laparoscopy was often followed on a separate date by an operative laparoscopy.

The bulk of the load of laparoscopic work continues to centre on adnexal surgery and the treatment of adhesions and endometriosis.

The last three years has seen the introduction of total laparoscopic hysterectomy as an operation at the Women's. This has not made it into the statistics yet, but is gradually replacing laparoscopically assisted vaginal hysterectomy, which is losing popularity. The place of total laparoscopic hysterectomy is becoming established in both oncological and benign gynaecology.

The future is likely to see gradually increasing numbers of total laparoscopic hysterectomies as skill levels rise and more gynaecologists become credentialled to include it in their scope of practice. In addition, laparoscopic myomectomy may well become more popular as laparoscopic suturing skills increase amongst operators. The role of laparoscopy in pregnancy has not been established, but is likely to become more accepted over time.

Laparoscopic Data

Although ICD-10-AM is revised every two years, the development of medical technology exceeds the rate in which these procedures can be captured within the ICD-10-AM classification system. The VAED data therefore has some limitations when trying to analyse the use of laparoscopic procedures at the Women's. The grouping of other laparoscopic procedures includes those procedures that had limited numbers of cases or those in which the laparoscopic procedure could not be clearly explained by ICD-10-AM.

Table 4: Laparoscopic procedures 2000-2006

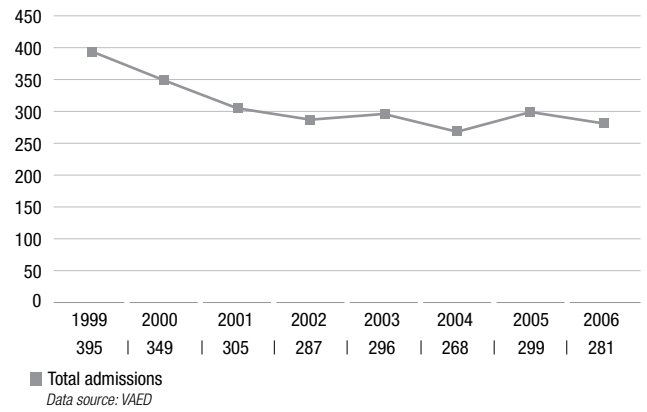
	2000	2001	2002	2003	2004	2005	2006
Diagnostic laparoscopy	297	563	406	326	272	334	309
Laparoscopic sterilisation	453	435	422	351	253	280	235
Laparoscopic division abdominal adhesions	125	217	242	214	204	208	204
Laparascopic diathermy of lesions	206	218	218	244	199	228	190
Laparoscopic ovarian cystectomy, unilateral	128	137	116	98	140	129	143
Laparoscopic excision of lesion	90	60	66	65	66	65	75
Laparoscopic salpingo-oophorectomy bilateral	28	23	33	27	35	37	36
Laparoscopic salpingo-oophorectomy, unilateral	8	16	18	17	20	15	19
Laparoscopic oophorectomy, unilateral	17	21	12	14	22	15	16
Laparoscopic salpingectomy, unilateral	16	11	16	13	7	22	16
Laparoscopic ovarian cystectomy, bilateral	21	10	14	20	16	18	15
Laparoscopically assisted vaginal hysterectomy	12	23	19	13	9	5	12
Laparoscopic partial salpingectomy, unilateral	22	12	7	13	14	17	11
Other types of laparoscopy	93	97	72	53	54	42	36
Total	1516	1843	1661	1468	1311	1415	1317

Data source: VAED. Some women may have more than one Laparoscopy procedure coded

Endometriosis

Surgical treatment of endometriosis is predominantly via laparoscopy, either by diathermy ablation or excision. A randomised trial comparing symptom relief from these two surgical treatments will complete recruitment in mid 2007. Over the last seven years surgical treatment of endometriosis at the Women's has shifted. The previous approach involved two steps, a diagnostic laparoscopy followed by laparoscopic diathermy ablation of endometriosis. The current approach is to try to combine the diagnosis and treatment of endometriosis during the one laparoscopy. Excision has become more common than ablation as the treatment mode, requiring greater time in theatre. This has resulted in a drop in the number of cases performed.

Figure 2: Number of admissions of women with endometriosis



Data source: VAED

Table 5: Types of endometriosis

	1999	2000	2001	2002	2003	2004	2005	2006
Endometriosis of uterus	297	188	139	141	109	100	156	203
Endometriosis of ovary	167	160	164	139	137	128	115	119
Endometriosis of fallopian tube	7	14	10	21	15	14	19	19
Endometriosis of pelvic peritoneum	395	349	305	287	296	268	321	281
Endometriosis of rectovaginal septum and vagina	11	4	6	2	4	5	8	7
Endometriosis of intestine	8	5	2	6	12	17	15	18
Endometriosis in cutaneous scar	4	2	0	0	1	2	0	1
Other endometriosis	30	37	30	19	39	25	29	19
Endometriosis, unspecified	8	14	18	3	30	22	15	18
Total	927	773	674	618	643	581	678	685

Data source: VAED

The number of women having a hysterectomy for treatment of endometriosis has fallen over the last seven years. These data reflect an increasing understanding that endometriosis is an extra-uterine disease. This is supported by the increased number of intestinal and rectovaginal septum endometriosis being diagnosed. An increasing number of women with severe endometriosis are undergoing radical surgery involving resection of segments of bowel or bladder. Such surgery is done while conserving the uterus if fertility is desired. Supportive long-term partnerships have been established with a colo-rectal surgeon and a urologist.

Table 6: Surgical procedures for endometriosis

	1999	2000	2001	2002	2003	2004	2005	2006
Total abdominal hysterectomy	185	123	91	70	76	64	87	118
Dilation and curettage	206	157	152	130	170	153	191	156
Laparoscopy	0	46	90	72	40	37	48	46
Vaginal hysterectomy	106	68	42	40	37	38	58	50
Hysteroscopy	182	160	156	151	171	153	185	153
Diathermy of endometriosis	14	6	6	8	9	3	3	3
Laparoscopic diathermy of lesion	225	189	202	202	224	191	220	177
Excision of lesion	7	6	5	1	7	1	2	6
Laparoscopic excision of lesion	47	90	60	66	65	66	65	75

Total complication rates over the last seven years have been low (2%-7%), but are an underestimate as they do not include complications following discharge from hospital. This is particularly important in these women given the high number of day cases.

Table 7: Complications of procedures done for endometriosis

	1999	2000	2001	2002	2003	2004	2005	2006
Urinary (including UTI's)	10	4	3	3	5	5	1	0
Haemorrhage / Haematoma	3	2	1	2	1	1	3	3
Accidental Puncture / Lacerations	7	5	2	4	6	6	1	3
Post-operative Infection	3	0	0	0	0	0	0	0
Other specified complication	4	3	0	2	4	6	3	5

Data source: VAED

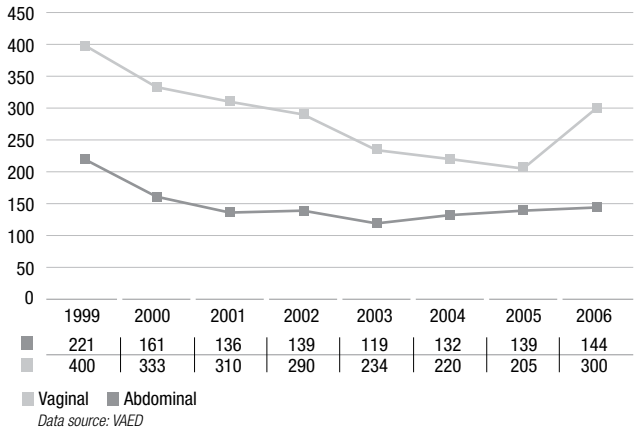
A study at the Women's is currently underway trying to establish a blood test diagnosis for endometriosis. Such a test would significantly reduce the number of "normal" laparoscopies performed while investigating pelvic pain.

The presence of a general gynaecology clinic with a special interest in endometriosis has allowed development of consistency in treatment of endometriosis and commencement of clinical research. Gynaecologists involved have developed specific operative skills for management of severe disease both at laparoscopy and laparotomy. This is likely to reduce the recurrence rates of endometriosis.

Hysterectomy

Over the time period 1999-2006, 3483 hysterectomies were performed by either the vaginal (1191, 34%) or abdominal (2292, 66%) routes. The proportion has remained stable throughout the time period, with a ratio of approximately 1/3 to 2/3. We performed an average of 4-600 cases per year.

Figure 3: Number of women having vaginal and abdominal hysterectomies



Data source: VAED

Laparoscopic hysterectomies contributed small numbers over this reporting period. In future reports more detail on this will be reported.

Age patterns

The age of patients on whom hysterectomy is performed follows a normal distribution, skewed to the right with a peak incidence in the 45-49 years age group for both abdominal and vaginal hysterectomy. The average age has remained stable throughout the review period.

Table 8: Ages of women having hysterectomy

	1999	2000	2001	2002	2003	2004	2005	2006
≤19 years	1	0	0	1	0	0	0	0
20-29 years	13	4	2	7	4	8	3	5
30-39 years	73	64	51	60	49	47	41	58
40-49 years	254	194	175	166	140	122	136	180
50-59 years	142	112	105	92	71	70	70	92
60-69 years	88	71	73	59	59	68	57	71
≥ 70 years	50	49	40	44	30	37	37	38

Data source – VAED

Length of Stay

The majority of women having a vaginal hysterectomy stay in hospital for about 1- 4 days. Women having an abdominal hysterectomy stay in hospital on average 5-9 days. This is consistent with trends elsewhere. Length of stay has reduced for both hysterectomy procedures.

Table 9: Length of stay for women having abdominal hysterectomy

	1999	2000	2001	2002	2003	2004	2005	2006
1-4 days	188	154	140	146	100	92	94	170
5-9 days	189	150	144	133	116	116	96	121
10-14 days	15	20	17	6	11	7	10	6
15-19 days	5	4	4	2	4	2	3	2
20-24 days	1	1	1	2	2	2	0	0
>25 days	2	4	4	1	1	1	2	1
Total women	400	333	310	290	234	220	205	300

Data source: VAED

Table 10: Length of stay for women having vaginal hysterectomy

	1999	2000	2001	2002	2003	2004	2005	2006
1-4 days	188	128	116	114	101	111	122	113
5-9 days	26	30	17	22	13	20	17	10
10-14 days	6	2	2	2	4	0	0	1
15-19 days	1	1	0	0	1	1	0	0
20-24 days	0	0	1	0	0	0	0	0
>25 days	0	0	0	1	0	0	0	0
Total women	221	161	136	139	119	132	139	124

Data source: VAED

Indications

The most common indication for abdominal hysterectomy remains uterine myomata (fibroids) which accounts for over 50% of abdominal hysterectomy each year. Adenomyosis and ovarian pathology are also frequent indications for abdominal hysterectomy. Note that indications for hysterectomy are not mutually exclusive, i.e. a patient may have more than one reason coded for her hysterectomy.

Table 11: Indications for abdominal hysterectomy

DIAGNOSES	1999	2000	2001	2002	2003	2004	2005	2006
Fibroids	220	178	167	144	117	115	115	163
Incidence %	55.0	53.5	53.9	49.7	50.0	52.3	56.1	54.3
Endometriosis of Uterus	168	100	86	67	61	48	69	109
Incidence %	42.0	30.0	27.7	23.1	26.1	21.8	33.7	36.3
Dysfunctional Uterine Bleeding	12	5	6	9	6	13	3	10
Other Disorder of menstruation and abnormal bleeding	105	66	56	70	62	36	39	51
Incidence %	26.3	19.8	18.1	24.1	26.5	16.4	19.0	17.0
Carcinoma of Uterus	62	42	45	42	40	38	41	53
Carcinoma of Cervix	17	6	7	11	12	11	5	14
Endometrial Hyperplasia	23	12	13	11	10	13	12	19
Ovarian Disease including -								
Endometriosis of Ovary	21	24	24	18	13	17	15	19
Carcinoma of Ovary	33	41	45	22	11	17	17	27
Polyp/Cyst of Ovary	59	34	20	24	25	35	28	36
Benign neoplasm of Ovary	34	33	35	23	28	17	19	25
Total	147	132	124	87	77	86	79	107
Incidence %	36.8	39.6	40.0	30.0	32.9	39.1	38.5	35.7
Miscellaneous -								
Endometriosis of Pelvic/Peritoneum	13	10	10	12	4	5	6	12
Pelvic and Uterine Adhesions	52	50	33	44	35	22	27	35
Prolapse of Uterus/Vagina	4	10	8	1	4	0	1	2
Polyp Uterus	39	42	44	20	29	26	34	43

Data source: VAED

In the case of vaginal hysterectomy, uterine prolapse accounts for 66% of vaginal hysterectomy performed. Fibroids and adenomyosis are similarly frequent indications for vaginal hysterectomy.

Table 12: Indications for vaginal hysterectomy

DIAGNOSES	1999	2000	2001	2002	2003	2004	2005	2006
Prolapse	141	100	98	88	84	89	77	95
Incidence %	63.8	62.1	72.1	63.3	70.6	67.4	55.4	66.0
Fibroids	86	63	51	58	39	45	47	51
Incidence %	38.9	39.1	37.5	41.7	32.8	34.1	33.8	35.4
Endometriosis	109	70	53	46	42	40	57	52
Incidence %	49.3	43.5	39.0	33.1	35.3	30.3	41.0	36.1
Dysfunctional Uterine Bleeding	9	6	3	4	8	4	9	10
Endometrial Hyperplasia	8	4	1	4	4	4	8	3
Polyp Uterus	28	16	13	5	13	13	23	24
Other disorder of menstruation and abnormal bleeding	88	45	36	46	28	25	37	27
Incidence%	39.8	28.0	26.5	33.1	23.5	18.9	26.6	18.8

Data source: VAED

Malignancies of cervix uteri, endometrium and ovary accounted for approximately 30% of abdominal hysterectomy and a negligible proportion of vaginal hysterectomy.

Table 13: Carcinoma types for abdominal hysterectomy

Carcinoma of Uterus	62	42	45	42	40	38	41	53
Carcinoma of Cervix	17	6	7	11	12	11	5	14
Carcinoma of Ovary	33	41	45	22	11	17	17	27
Total	112	89	97	75	63	66	63	94
Incidence %	28.0	26.7	31.3	25.9	26.9	30.0	30.7	31.3

Data source: VAED

Complications

Each procedure has its own complication profile. The incidence of wound infection for women having an abdominal hysterectomy has reduced. (see Infection Control)

Table 14: Complications of abdominal hysterectomy (Numbers)

	1999	2000	2001	2002	2003	2004	2005	2006
Urinary tract infection	23	26	21	22	13	15	7	15
Haemorrhage / haematoma	18	18	10	13	16	14	12	11
Post-operative wound infection	32	26	14	11	6	6	4	7
Accidental puncture/laceration	8	4	3	2	1	1	7	4
Disruption of operation wound	6	7	6	3	2	2	1	4
Other specified complications	13	7	1	0	4	4	1	3

Data source: VAED

Table 15: Complications of vaginal hysterectomy (Numbers)

	1999	2000	2001	2002	2003	2004	2005	2006
Urinary tract infection	14	13	6	13	5	4	7	7
Haemorrhage / haematoma	7	6	4	2	2	5	4	6
Other specified complications	6	2	0	0	2	1	1	2
Post-operative wound infection	16	5	1	4	2	0	1	2
Accidental puncture/laceration	4	1	1	1	1	4	5	1

Data source: VAED

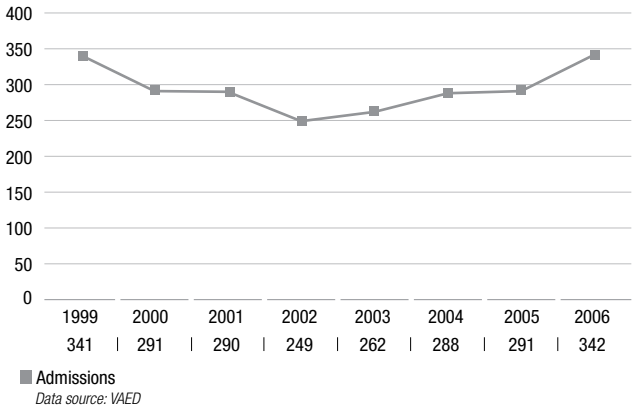
The last ten years has seen the introduction of various techniques for the minimally invasive removal of the uterus, some of which are now being introduced to mainstream practice at the Women's. Laparoscopic Assisted Vaginal Hysterectomy (LAVH) and Total Laparoscopic Hysterectomy (TLH) seek to reduce inpatient stay and post discharge return to normal function, compared to abdominal hysterectomy, at the expense of often increased operating theatre time and utilisation of disposable materials. Literature and local experience suggests that complication rates and operating time will approximate those of vaginal hysterectomy/ abdominal hysterectomy with growth of expertise in new technologies.

Adoption of new technologies may at first result in diverting hands on theatre time from registrars to consultant staff, as necessary skills are developed. However we must be mindful that the services the Women's provide must keep pace with current best practice, and reflect community demands. These demands should also in time reflect the training our registrars receive.

Dysfunctional Uterine Bleeding

The number of women with Dysfunctional Uterine Bleeding (DUB) in 2006 rose again to 1999 levels after a decline. The reason for this is unclear but consistent with other areas of the hospital which are experiencing an increased throughput.

Figure 4: Number of admissions of women for dysfunctional uterine bleeding



Data source: VAED

Table 16: Age of women admitted with dysfunctional uterine bleeding

	1999	2000	2001	2002	2003	2004	2005	2006
< 45 years	224	176	169	162	173	182	213	213
> 45 years	117	115	121	87	89	106	78	129

Data source: VAED

It is pleasing to see low utilisation of hysterectomy for management of DUB and low incidences of dilataton and curettage (D+C) as a diagnostic aid. The increase in D+Cs in 2006 parallels the increase in throughput of women older than 45 years, a group in which D+C is clinically appropriate.

Table 17: Procedures undertaken for dysfunctional uterine bleeding

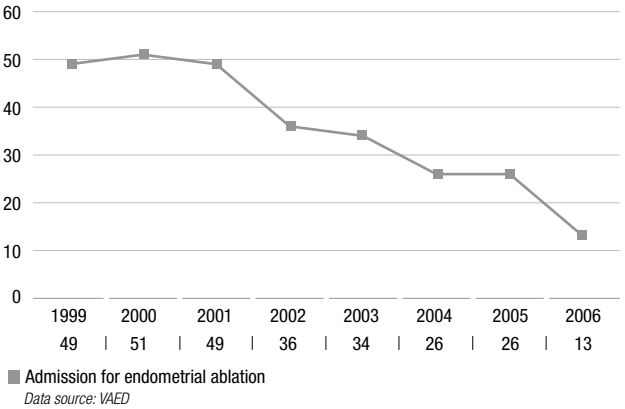
	1999	2000	2001	2002	2003	2004	2005	2006
No procedures performed	10	9	37	46	48	60	84	43
Incidence %	2.9	3.1	12.8	18.5	18.3	20.8	28.9	12.6
Diagnostic Hysteroscopy	253	205	200	125	142	158	117	187
Incidence %	74.2	70.4	69.0	50.2	54.2	54.9	40.2	54.7
Dilation and Curettage	276	185	148	115	115	144	101	183
Incidence %	80.9	63.6	51.0	46.2	43.9	50.0	34.7	53.5
Diagnostic Laparoscopy	25	11	19	16	17	15	10	16
Incidence %	23.7	21.8	17.6	18.5	16.8	17.4	11.9	15.6
Vaginal Hysterectomy	9	6	3	8	8	4	10	15
Incidence %	2.6	2.1	1.0	3.2	3.1	1.4	3.4	4.4
Hysterectomy (all types excl. vaginal)	12	5	6	17	5	11	4	11
Incidence %	3.5	1.7	2.1	6.8	1.9	3.8	1.4	3.2
Diathermy of Cervix	49	34	20	15	11	8	13	10
Incidence %	14.4	11.7	6.9	6.0	4.2	2.8	4.5	2.9
Endometrial Ablation (endoscopic)	9	13	10	12	12	14	10	9
Incidence %	2.6	4.5	3.4	4.8	4.6	4.9	3.4	2.6
Other	5	2	2	0	2	2	0	0
Incidence %	1.5	0.7	0.7	0.0	0.8	0.7	0.0	0.0

Data source: VAED

Endometrial Ablation

The low numbers of endometrial ablations may be due to the absence of second and third generation ablation techniques at the hospital as an alternative to the levonorgestrel IUCD. This is currently being addressed.

Figure 5: Number of admissions for endometrial ablation



Data source: VAED

Table 18: Age of women admitted for endometrial ablation

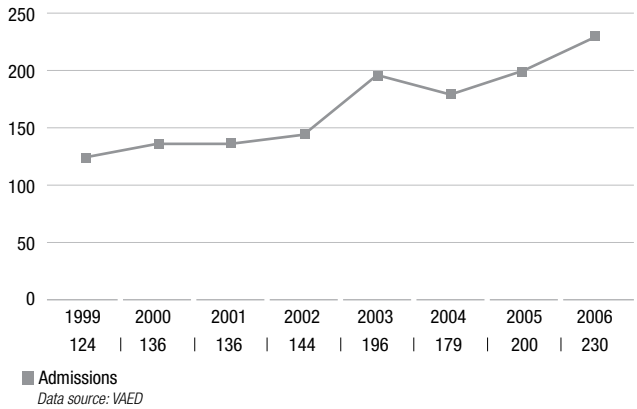
	1999	2000	2001	2002	2003	2004	2005	2006
< 45 years	28	25	23	14	19	18	17	9
> 45 years	20	26	25	21	15	8	8	4

Data source: VAED

Complications were infrequent for this procedure and usually minor, eg accidental puncture with no significant morbidity.

Ectopic Pregnancy

Figure 6: Number of admissions of women with ectopic pregnancy



Data source: VAED

Changes to the inpatient management of ectopic pregnancies over the last 8 years are noted with the obvious increase in the acceptance and usage of medical management with methotrexate. The increase in medical management is made possible by access to high quality ultrasound scanning for diagnosis, and the use of methotrexate as an effective treatment for ectopic pregnancy is supported by the literature in appropriate patients. (see Emergency department section for non-admitted women with ectopic pregnancy)

Complications were infrequent for this procedure and usually minor.

Table 19: Inpatient management of ectopic pregnancy

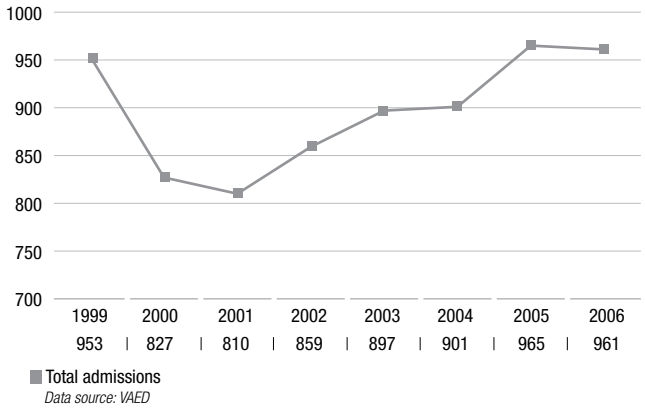
	1999	2000	2001	2002	2003	2004	2005	2006
Open salpingectomy	9	5	10	6	10	5	3	5
Laparoscopic salpingectomy	66	78	68	53	53	67	63	80
Dilation and curettage of uterus	24	24	3	2	5	10	6	11
Methotrexate management or medical management for ectopic pregnancy.	9	25	14	37	79	77	91	119
Unilateral salpingo-oophorectomy	1	2	1	0	1	0	0	0
Laparoscopic salpingotomy	18	13	16	4	7	2	4	8
Associated procedures at time of surgery	30	33	38	28	23	15	16	25
Total procedures*	157	180	150	130	178	176	183	248

Data Source: VAED. Some women have had more than 1 procedure

Miscarriage

The total number of women presenting with miscarriage has seen a gradual upward trend since 2000. This increase is probably another manifestation of the increased birth rate (hence pregnancy rate) that the hospital (and Australia) is experiencing.

Figure 7: Total number of admissions related to miscarriage



Data source: VAED

Table 20: Principal diagnosis for admitted women

	1999	2000	2001	2002	2003	2004	2005	2006
Threatened miscarriage	30	17	15	26	68	73	74	37
Missed miscarriage	466	430	429	461	519	546	554	537
Incomplete miscarriage	282	206	184	177	149	177	191	205
Blighted ovum	76	82	94	59	40	35	35	24
Septic miscarriage	11	4	1	1	6	5	4	4
Complete miscarriage	33	39	25	51	63	48	63	59
Hydatid. Mole	55	49	62	84	52	17	44	95

Data Source: VAED

The percentage of women undergoing dilatation and curettage appears to have decreased in certain categories.

Table 21: Surgical procedures for miscarriage

	1999	2000	2001	2002	2003	2004	2005	2006
Total surgical procedures	832	742	708	648	644	654	622	717
Rx with D+C or Suction D+C %	87.3	89.7	87.4	75.4	71.8	72.6	64.5	74.6

Data source: VAED

The reduced number of surgical interventions, these being dilatation and curettage or dilatation and curettage, is in accordance with current literature on the subject. 96% of women had a D&C for an incomplete miscarriage in 1999, and 77% in 2006 (63% in 2005). Similarly, in 1999, 50% of women with a diagnosis of a complete miscarriage underwent a D&C, whereas only 37% in 2006 (31% in 2005).

Table 22: Treatment with dilatation and curettage or suction dilatation and curettage

	1999	2000	2001	2002	2003	2004	2005	2006
Missed miscarriage (n)	448	421	418	424	462	472	435	499
D+C for missed miscarriage %	96.1	97.9	97.4	92.0	89.0	86.4	78.5	92.9
Incomplete miscarriage	271	193	175	144	111	135	121	157
D+C for incomplete miscarriage %	96.1	93.7	95.1	81.4	74.5	76.3	63.4	76.6
D+C for incomplete or missed miscarriage %	96.1	96.5	96.7	89.0	85.8	84.0	74.6	88.4
Blighted ovum	75	81	91	55	37	25	27	20
D+C blighted ovum %	98.7	98.8	96.8	93.2	92.5	71.4	77.1	83.3
Septic miscarriage	10	3	1	0	3	1	2	1
Complete miscarriage	16	15	8	10	11	9	20	22
D+C for complete miscarriage %	48.5	38.5	32.0	19.6	17.5	18.8	31.7	37.3
Hydatid. Mole	12	29	15	15	20	12	17	17

Data Source: VAED

There does not appear to have been an increase in the numbers of women in these groups using prostaglandins. Presumably the remaining women in these two groups (complete and incomplete miscarriage) had expectant management, allowing "nature to take its course" and spontaneous expulsion of the remaining products of conception to occur.

In women with an *incomplete miscarriage*, a recent meta-analysis[1] showed that there was a 94% chance of having a complete miscarriage with expectant treatment. A recent Cochrane review[2] suggested that the relative risk for an incomplete miscarriage with expectant management (compared to surgical) was 4.78.

Another meta-analysis[3] suggested that medical management was superior to expectant, but only had a two-thirds chance of inducing a complete miscarriage compared to surgical management.

The majority of women with a *missed miscarriage* or *blighted ovum* have continued to have surgical evacuation (96% in 1999, 94% in 2006). They were also the group most likely to receive prostaglandins, although this would appear to be decreasing over the last few years (21 women in 1999, 14 in 2005 and 8 in 2006. The number of women receiving prostaglandins has always been a small proportion of those with a missed miscarriage or blighted ovum (4% in 199, 1% in 2006). It is uncertain from the data whether prostaglandin was used as a priming agent prior to surgery or as a sole agent to cause uterine emptying. According to the literature, surgical evacuation of the uterus is much more likely to result in a complete miscarriage than either medical treatment or expectant management in missed miscarriage. (1)

Table 23: Treatment with prostaglandin

	1999	2000	2001	2002	2003	2004	2005	2006
Threatened miscarriage	0	0	0	0	0	1	0	0
Missed miscarriage	21	11	10	21	20	18	14	8
Incomplete miscarriage	6	6	3	8	2	0	2	4
Blighted ovum	0	0	1	0	1	0	0	0
Septic miscarriage	2	1	1	0	0	0	0	0
Complete miscarriage	2	1	1	3	1	0	1	0
Hydatid. Mole	0	0	0	0	2	0	0	0
Total treatments	31	19	16	32	26	19	17	12
Rx with prostaglandin %	3.3	2.3	2.0	3.7	2.9	2.1	1.8	1.2
Missed miscarriage rx with prostaglandin %	4.5	2.6	2.3	4.6	3.9	3.3	2.5	1.5

Data source: VAED

Septic miscarriage fortunately remains low, affecting only 4 women in 2006.

The establishment of an EPAS (Early Pregnancy Assessment Service) will give us the opportunity for more complete data collection, and the possibility of assessing alternative methods of treatment for these common and distressing problems for women.

Sterilisation

There has been a 56% reduction in the number of sterilisation operations performed since 1999 particularly in the older age groups, but it remains a popular choice of contraception (in absolute number terms) in women in their 30s. This reduction may well be related to the introduction of reversible, long acting extremely reliable methods of contraception eg Implanon and Mirena IUS.

Table 24: Tubal procedures for sterilisation (ligation, filshie clips and occlusion of fallopian tube)

	1999	2000	2001	2002	2003	2004	2005	2006
Laparoscopic	589	453	435	422	351	253	280	235
Open	83	47	63	49	69	83	82	80
Total	672	500	498	471	420	336	362	315
Laparoscopy %	87.6	90.6	87.3	89.6	83.6	75.3	77.3	74.6
Open %	12.4	9.4	12.7	10.4	16.4	24.7	22.7	25.4

Data source: VAED

The operation is increasingly done as an open operation (12.4 % in 1999 and 25.4% in 2006) rather than via the laparoscope. Some of these are at caesarean section, others perhaps reflecting a greater surgical complexity of cases or the acknowledged public health epidemic of obesity.

Table 25: Complications of tubal procedures relating to sterilisation

	1999	2000	2001	2002	2003	2004	2005	2006
Haemorrhage	0	1	0	0	0	1	1	1
Accidental puncture	10	7	5	5	2	1	1	0

Data source: VAED

Intra Uterine Contraception

Since the introduction of Mirena (levonorgestrel containing IUCD) there has been a steady increase in the total number of IUCDs from around 500/year to over 1000/year inserted in outpatients and under anaesthesia (the latter for contraception after pregnancy termination and for menorrhagia management).

Table 26: IUCD insertion in outpatients

	1999	2000	2001	2002	2003	2004	2005	2006
Mirena	13	11	39	47	58	102	148	195
Copper IUCD	312	321	298	308	293	313	303	313
Total outpatients	325	332	337	355	351	415	451	508

Data Source: clinic records and correlated with Pharmacy prescriptions

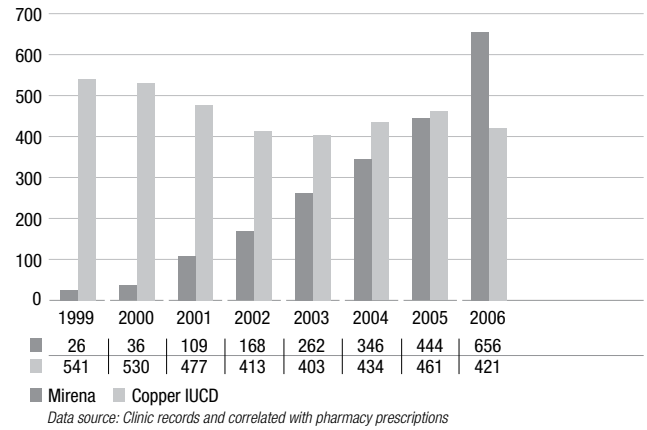
Table 27: IUCD insertion in inpatients

Inpatient	1999	2000	2001	2002	2003	2004	2005	2006
Mirena	13	25	70	121	204	244	296	461
Copper IUCD	229	209	179	105	110	121	158	108
Total inpatients	242	234	249	226	314	365	454	569

Data Source: clinic records and correlated with Pharmacy prescriptions

The increase in numbers has been predominantly in the increase in numbers of women requesting Mirena (now 60% of insertions) reflecting a resurgence of interest by women and their referring GPs in the IUD as a contraceptive with the added benefit of reduction in menstrual loss and pain associated with Mirena. The copper IUCD still is requested by a significant number of women (>400) and is preferred particularly by women who for cultural reasons prefer to have predictable monthly bleeding to oligo/amenorrhoea.

Figure 8: Total number of IUCD insertion



Data source: Clinic records and correlated with pharmacy prescriptions

Table 28: Age of IUCD insertion

	1999	2000	2001	2002	2003	2004	2005	2006
< 20	0	0	0	5	7	4	5	16
20-29	43	55	68	53	109	108	123	125
30-39	121	134	135	111	115	126	158	112
40-49	72	43	44	52	70	110	135	201
> = 50	6	2	2	5	13	17	33	35
Total	242	234	249	226	314	365	454	569

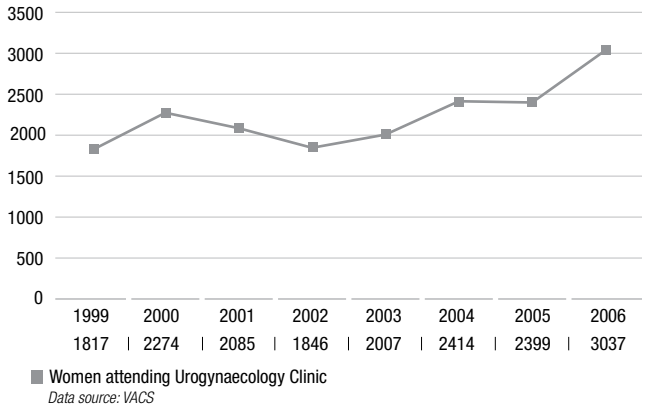
Data source: VAED

The rate of admission for infection after insertion is very low, with the last recorded admission in 2001 (1% in that year). The safety of the IUCD has been reaffirmed in recent published work. Large scale WHO clinical trials and systematic literature reviews consistently demonstrate that the risk of pelvic inflammatory disease is increased only in the first 20 days after insertion and subsequently reflects the background prevalence of sexually transmitted infection (STI). Infection is related to the presence of undetected STI at insertion. The majority of studies investigating fertility return after IUCD use have shown no impairment.

Urogynaecology and pelvic floor displacement service

This service has seen a steady rise in the number of new women referred to the service and the number of ongoing reviews.

Figure 9: Attendances at Urogynaecology outpatient clinics



Data source: VACS

We have also seen a reduction in the number of surgical intervention, and therefore admission, for stress urinary incontinence and pelvic organ prolapse in the past 5 years.

This reduction in surgery has occurred due to use of more effective conservative treatments of pelvic floor disorders (e.g. pelvic floor muscle training, lifestyle interventions such as dietary modifications) and the introduction of more effective and less morbid surgeries to treat pelvic floor disorders.

Surgical management

For the surgical management of stress incontinence, the tension-free vaginal tape (TVT) has replaced the colposuspension as the clinically preferred procedure. This is reflected in the gradual increase in the TVT procedure over the past seven years and a reduction in the laparoscopic colposuspension.

The trend towards the TVT procedure for stress incontinence in women whom do not respond to pelvic floor muscle retraining is consistent with international trends.

The number of cases undergoing surgery for pelvic organ prolapse has reduced in last few years and this has coincided with the more widespread use of synthetic grafts to augment prolapse surgery. This has resulted in fewer cases of recurrent prolapse and fewer cases of repeat surgery.

A dramatic reduction in sacrospinous fixation procedures in the past two years is due the introduction of new surgery for prolapse developed at the Women's. This new surgery involves a simple and novel approach using mesh and placement of a vaginal support device into the lumen of the vagina at the completion of surgery. By supporting the positioning of the mesh until incorporation into the body tissues occurs, it is possible to avoid placing sutures into the sacrospinous ligaments or paravaginal spaces. This makes surgery much simpler to perform and reduces the risk of the specific complications that can occur with suture placement into these structures or when tunneling devices are used beyond the pelvic cavity.

The Urogynaecology Service has developed a new surgical approach to pelvic organ prolapse. An international clinical study evaluating this procedure and involving 11 centres (in England, Germany, USA and Australia) is currently underway. The Women's is providing an international lead in the surgical management of pelvic organ prolapse.

Recent philanthropic funding has enabled the unit to purchase state of the art equipment to investigate women with pelvic floor dysfunction, conduct perineal trauma workshops and expand the clinical activities of the Perineal Clinic, established in 2006 to assess and manage obstetric perineal trauma.

We have also implemented more effective conservative treatments for lower urinary tract symptoms. Our pharmacy department has made available tolteradine and solifenacin, two new drug treatments for urge incontinence. The physiotherapy department have developed an increased focus on the treatment of female urinary incontinence and has dramatically increased the numbers of women receiving optimal conservative treatments. Clinical sessions for the continence nurse advisors have increased during the past 18 months enabling improved access for women to non surgical assessment and management.

The unit has introduced the trans-obturator tape to treat stress incontinence. This is a 10-minute day procedure and has an objective cure rate of 94% in our hands[4].

[4] *Lim J, Carey M, Cornish A. BJOG 2006; 113:1315-20.*

Table 29: Urogynaecology admissions and most common reasons

	1999	2000	2001	2002	2003	2004	2005	2006
Stress and other urinary incontinence	233	219	193	232	182	179	160	172
Pelvic organ prolapse	336	209	235	274	275	256	223	232

Data Source: VAED

Table 30: Urogynaecology treatment and procedures

	1999	2000	2001	2002	2003	2004	2005	2006
Tension-free Vaginal Tape (TVT)	31	97	81	82	87	96	110	119
Anterior and Posterior Repair Prolapse	111	90	108	117	163	174	146	127
Repair of Cystocele	61	44	44	35	19	13	5	20
Repair of Rectocele	65	53	52	62	47	29	25	31
Colposuspension	9	24	30	45	81	87	52	35
Hysteropexy	11	2	4	7	5	16	12	3
Sacrospinous Fixation	112	60	61	73	62	35	17	18
Paravaginal Repair	16	6	9	20	24	17	7	2
Paravaginal Repair for stress Incontinence	10	4	7	11	7	2	1	2
Manchester Repair	7	4	3	2	0	0	0	1
Total procedures	433	384	399	454	495	469	375	358

*Data Source: VAED. *Women may have more than one procedure*

Oncology and Dysplasia Service

Dysplasia

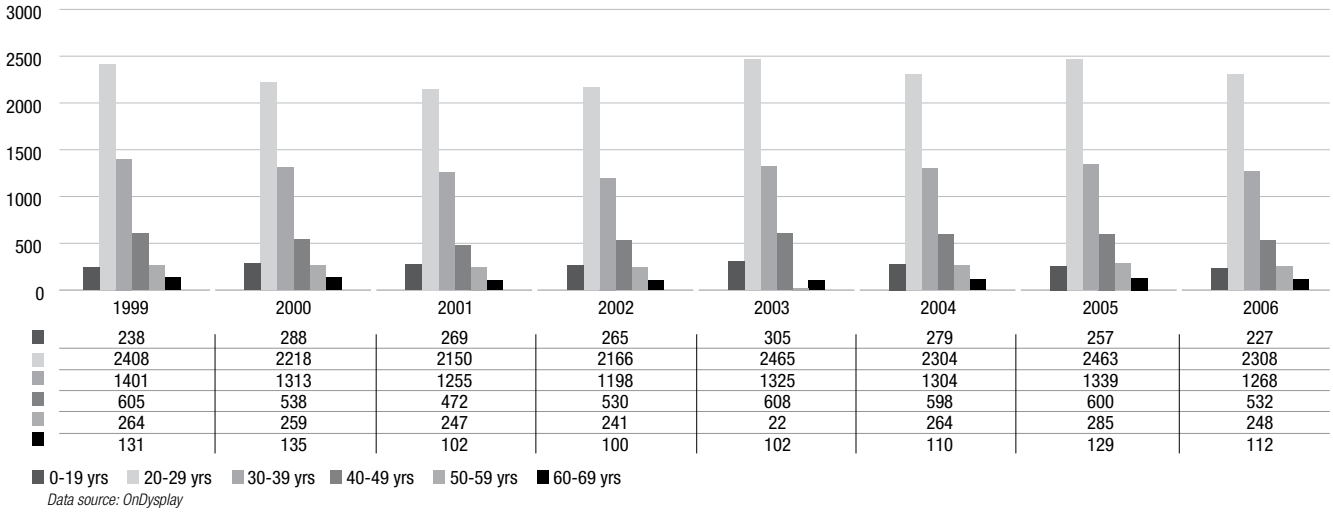
Table 31: Occasions of service for Dysplasia Clinic

	1999	2000	2001	2002	2003	2004	2005	2006
Total patients	4473	4525	4274	4291	4415	4523	4786	4470
Operations	1190	1012	722	802	898	759	732	618

Data source: OnDysplay

Since 1999 referrals have remained constant. New cases occur most commonly in the 20 to 40 year old age group with constant regularity over the time frame studied, although new referrals of women over 70 years old have fallen off due to the screening guidelines. This upper age limit for pap smears may have to be revisited.

Figure 10: Total visits (excludes operations) by age group for women with dysplasia

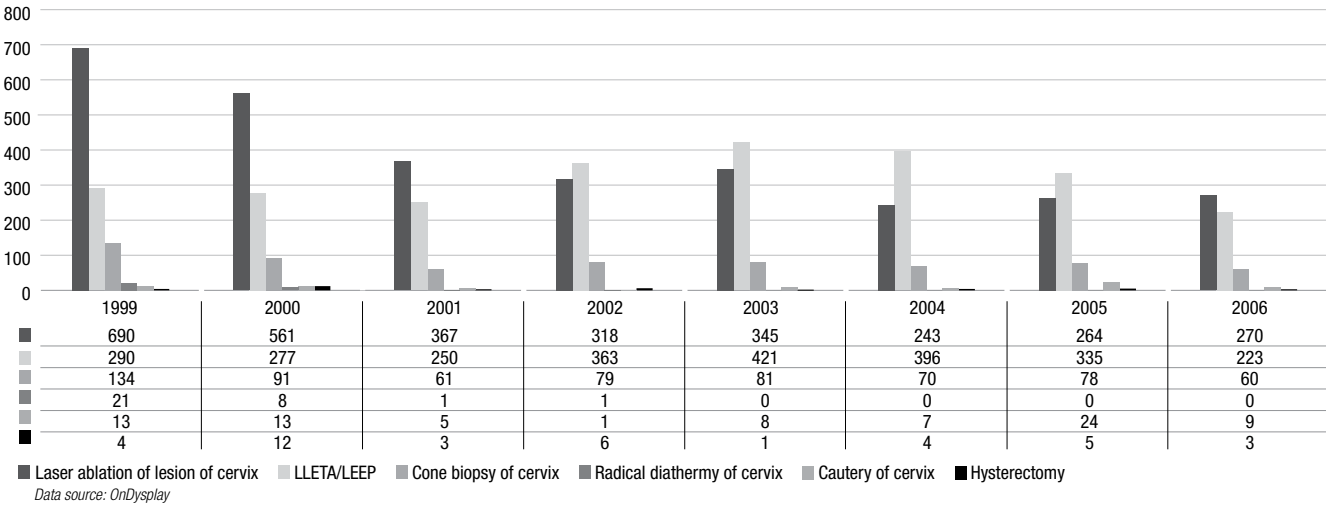


Data source: OnDysplay

Surgical procedures

Ablative therapies have reduced in frequency since loop excision has become popular. We are going to review this policy as there is some data now suggesting that loop excision may be associated with adverse perinatal outcomes. Cone biopsy rates have remained static, as expected, since indications for this procedure have remained unchanged.

Figure 11: Number of surgical procedures performed for dysplasia.



Data source: OnDysplay

Oncology

Oncology practice is changing. We are seeing more benign "complex' cases requiring extensive and often difficult surgery while continuing to have a regular referral of women with invasive malignancy.

Cancer sites and total new cases are depicted below. It is estimated that the Women's sees about 36% of all new cases of gynaecological cancer in Victoria annually. This suggests that there are women in the community who are still having their treatment outside of an established gynaecological cancer unit and this issue of equity of access is currently being addressed by the Integrated Cancer Services in Victoria. The number of new cases has been stable over the last seven years, reflecting established referral patterns.

Table 32: Number of women treated for gynaecological cancer

Site	1999	2000	2001	2002	2003	2004	2005	2006
Ovary	66	74	57	59	66	66	68	69
Endometrium	64	47	52	59	51	53	65	64
Cervix	40	21	28	31	40	34	39	50
Vulva	9	13	9	16	12	20	14	14
Unknown	3	4	3	4	3	6	4	7
Gastrointestinal	7	3	4	6	10	5	6	6
Uterus	4	0	5	8	7	4	4	6
Pelvis	3	2	1	1	0	2	4	5
Other	4	6	9	1	2	2	1	3
Peritoneum	2	6	8	6	9	7	5	2
Fallopian tube	0	2	1	3	1	0	6	1
Vagina	6	0	2	2	2	2	0	0
Total	281	231	236	230	241	239	216	227

Data source: GeMMA

Survival in women treated for gynaecological cancer

Details of our cases are submitted to the Federation of International Gynaecologists and Obstetricians (FIGO) which collects age, histology, stage and survival statistics across the developed and developing worlds. It should ideally allow us to compare our figures with other Australian hospital sites, but unfortunately we were the only hospital in Australia to use this tool. Steps have been taken by the FIGO Oncology subcommittee to try and make the submission of core clinical data easier and more attractive to possible contributors.

Table 33: Patients treated in 1999-2001- distribution of cancer patients by stage

	Total	Unstaged	Stage I	Stage II	Stage III	Stage IV
Cervix	91	2	56	13	14	6
Endometrium	157	8	113	16	17	3
Ovary	194	10	66	15	91	12

Data source: FIGO Report

Survival rates for women treated for gynaecological cancer compare favourably with other published survival information, apart from Stage 2 cancer of the cervix, which has a lower than expected survival. We are going to review this data to ensure that it is a true reflection of our management policies.

Table 34: Carcinoma of the cervix uteri: survival by FIGO stage

Strata	Patients(n)	Mean age (years)	Overall survival at					Hazards ratio[a]
			1 year	2 years	3 years	4 years	5 years	
Stage I	55	44.5	97.9%	93.0%	87.8%	81.7%	81.7%	Reference
Stage II	11	59.8	88.9%	44.4%	44.4%	44.4%	44.4%	4.0 (1.1-14.4)
Stage III	12	63.7	56.5%	36.0%	36.0%	36.0%	36.0%	5.3 (1.4-20.4)
Stage IV	4	74.3	100%	25.0%	25.0%	na	na	3.3 (0.6-17.2)

Data source: FIGO Report
[a] Hazards ratio and 95% Confidence Intervals obtained from a Cox model adjusted for age

Table 35: Carcinoma of the corpus uteri: survival by FIGO stage

Strata	Patients(n)	Mean age (years)	Overall survival at					Hazards ratio[a]
			1 year	2 years	3 years	4 years	5 years	
Stage I	113	60.6	96.9%	95.7%	93.2%	89.0%	86.9%	Reference
Stage II	16	63.2	92.6%	75.0%	65.0%	65.0%	65.0%	3.3 (1.0-11.1)
Stage III	17	64.2	85.7%	54.5%	54.5%	54.5%	54.5%	4.4 (1.6-12.2)
Stage IV	3	76.3	–	–	–	–	–	–

Data source: FIGO Report
[a] Hazards ratio and 95% Confidence Intervals obtained from a Cox model adjusted for age

The other observation around survival is the very high survival rates in Stage 2 ovarian cancer. This may again reflect our management policy and we are commencing a joint study with the Mercy Hospital to investigate these results.

Table 36: Carcinoma of the ovary: survival by FIGO stage

Strata	Patients(n)	Mean age (years)	Overall survival at					Hazards ratio[a]
			1 year	2 years	3 years	4 years	5 years	
Stage I	66	49.9	93.2%	91.2%	85.0%	77.7%	77.7%	Reference
Stage II	15	60.5	92.9%	92.9%	92.9%	92.9%	78.6%	0.6 (0.1-2.7)
Stage III	91	59.0	83.6%	61.0%	51.5%	40.9%	36.2%	3.4 (1.7-6.7)
Stage IV	12	57.8	72.7%	62.3%	62.3%	20.8%	10.4%	5.5 (2.2-13.6)

Data source: FIGO Report
a Hazards ratio and 95% Confidence Intervals obtained from a Cox model adjusted for age

Chemotherapy

Overall the amount of chemotherapy being dispensed has increased in the last five years. This probably reflects an increase in the number of new clinical trials, usually the under the auspices of the Australian and New Zealand Gynaecological Oncology Trials Group. In 2006, the number of patients on the Phenoxodiol trial decreased and this reduced the total occasions of service.

Table 37: Chemotherapy occasions of service

2002	2003	2004	2005	2006
399	476	899	904	675

Data source: GeMMA

Table 38: Number of women receiving first and subsequent chemotherapy regimes in 2006

	2006
Total Number of women receiving chemotherapy for malignancy	108
Number of women receiving single agent chemotherapy	49
Number of women receiving first line chemotherapy	57
Number of women receiving second line chemotherapy	32
Number of women receiving third line chemotherapy	14
Number of women receiving fourth line chemotherapy	14
Number of women receiving fifth line or more lines chemotherapy	12
Number of women who had more than one line of chemotherapy in 2006	17

Data source: GeMMA

Table 39: Principal chemotherapy regimens in 2006

	Number of patients
Carboplatin Paclitaxel combination	41
Carboplatin single agent	14
Cyclophosphamide oral	4
Docetaxel weekly regimen	6
Liposomal doxorubicin	16
Gemcitabine and Carboplatin combination	4
Methotrexate with Folinic acid (GTD)	6
Other – includes OVATURE, TARCEVA and CALYPSO trials	19

Data source: GeMMA. A woman can be in more than one regime

Our toxicity data are reassuring. There are no international benchmarks for toxicity with chemotherapy but it would seem that our toxicity profile falls within an acceptable range. This will of course need continuous monitoring. Since the introduction of dexamethasone as a pre and post medication in the Liposomal Doxorubicin regimen the number of patients experiencing skin toxicity has decreased dramatically. This change of practice allowed most patients having this regimen to complete the treatment without dose modification and delays.

Table 40: Number of patients with toxicity, treatment delays and dose reduction due to chemotherapy for 2006

	Toxicity	Treatment delay	Dose reduction
Chemotherapy Hypersensitivity (carboplatin, paclitaxel and liposomal doxorubicin)	14 (9.2%)		3
Febrile Neutropenia	4 (3.7%)	4	4
Constipation requiring admission	2 (1.8%)	0	0
Nausea requiring admission	4 (3.7%)		1
Infection	7 (6.5%)		2
Arthralgia and Myalgia	8 (7.4%)		2
Peripheral Neuropathy	8 (7.4%)		7
Skin Toxicity	4 (3.7%) 3 PPE/1 rash	3	3
Anaemia requiring transfusion	20 (18.5%)	0	4
Mouth ulcer	2 (1.8%)		
Diarrhoea	1 (1%)		
Neutropenia	8 (7.4%)	8	4
Thrombocytopenia	5 (5.4%)	5	5
Extravasation	2 (1.8%)	2	

Data source: GeMMA and Pharmacy database

There were 25 dose reductions due to toxicity and 19.4% of treatments were delayed due to toxicity, during 2006.

Reproductive Services

Table 41: Service summary for Reproductive Services

Year	No. OPU* (cases)	No. Thaw cycles	Babies Born	Twins %	% ET** x 1
1999	969	1,044	264	9.4	27
2000	954	1,010	298	11.4	29
2001	1,220	1,255	428	16.1	26
2002	1,253	1,300	504	17.7	27
2003	1,306	1,487	603	18.8	32
2004	1,388	1,588	622	16.4	43
2005	1,521	1,833	672	14.4	53
2006	1,425	1,807	[a]211	10.1	61

Data Source: Melbourne IVF
**OPU – Ovum pickups*
***ET – Embryo transfers*
a) Incomplete data

The Women's provides reproductive services in collaboration with Melbourne IVF. We offer a comprehensive array of services (or programs) for the assessment and treatment of couples or individuals with infertility or potential fertility problems.

These services include:

Infertility Assessment – we assess and advise patients with regard to their fertility problems. After assessment patients may be referred to specialised services within Reproductive Services for further assessment and/or treatment.

Reproductive Surgery – surgery is undertaken for both investigative and therapeutic purposes. A full range of endoscopic procedures including complex laparoscopic surgery to treat endometriosis and pelvic pathology is offered. Complex hysteroscopic surgery including resection of submucous fibroids and correction of uterine anomalies is also performed. Specialised microscopic surgery is undertaken for both male and females with tubal anastomosis to restore fertility. In addition, urological assessment and surgery can be arranged for those conditions that effect fertility.

Assisted Reproductive Technology (ART) – a state of the art IVF laboratory provides a full range of treatments available through invitro fertilisation. The focus of this program is to maximise the chance of conception whilst minimising the risk of multiple pregnancy. In essence, this program focuses on maintaining high pregnancy rates, whilst reducing the number of embryos transferred, to ensure multiple pregnancy rates are minimised. Results demonstrate an increase from 27% single embryo transfer in 1999 to 61% in 2006.

As a part of ART services, donor insemination is available for appropriate indications.

Endocrine Metabolic Services – this service is available for the assessment and treatment of polycystic ovarian syndrome that is a major cause of infertility. The Big Girl's Group is run as part of the Endocrine Metabolic service that comprehensively addresses fertility issues through a program of diet, exercise and fertility assessment.

Fertility Preservation Service – Reproductive Services and Melbourne IVF are world leaders in the research and development of scientific procedures to preserve fertility. The service offers assessment, counselling and fertility preservation, to include cryopreservation of oocytes, sperm and ovarian tissue. Melbourne IVF has made a large commitment to research in this most important area of fertility preservation.

Chronic Viral Infection – Reproductive Services established this comprehensive program to treat couples who are discordant in regard to Human Immunodeficiency (immunosuppressive) Virus (HIV). The clinic was established in collaboration with the Alfred Hospital and offers assessment and treatment for couples with discordant HIV status to minimise the risk of HIV infection. To date, we are proud to note that a number of pregnancies have resulted from our treatment, with no transmission of infection.

Counselling – our counsellors offer supportive infertility counselling to all of the above specialised treatment programs. Counselling is offered to any patient experiencing fertility difficulties and is available for mandatory indications as prescribed in the Victorian legislation. Ongoing or follow-up counselling is also provided for patients who are not able to conceive despite the full range of services available.

Pregnancy Advisory Service

The Women's is committed to providing publicly funded support for women with an unplanned or unintended pregnancy. The Pregnancy Advisory Service (PAS) was established in 1975, and has evolved to become a state-wide provider of information and counselling to assist women to make informed decisions about their pregnancy. In providing these services, we ensure the privacy of patients and respect the rights of women to determine their health choices.

The Pregnancy Advisory Service is a multidisciplinary service responding to thousands of new calls from women, their families and health professionals every year related to pregnancy options for unplanned and/or unwanted pregnancies. It offers comprehensive information, support, counselling for pregnancy options decision making, advocacy, support and post abortion counselling. It provides referrals to appropriate internal or external services relating to whether women are continuing or terminating their pregnancy. The Women's provides both public and private clinical assessments for surgical termination of pregnancy, available for terminations up to 18 weeks. Demand for services exceeds the availability of appointments and PAS prioritises services for marginalised women or women with complex social and medical circumstances, where possible.

The criterion for termination of pregnancy at the Women's is consistent with the Victorian Menhenneit guidelines for the lawful termination of pregnancy.

Demographics 2005/6

- Women contact PAS from all regions of Victoria and from southern NSW and Tasmania, with the majority from the north western and southern regions.
- Ages range from 13 to 51.
- Interpreters assisted in 336 interviews with women in 23 languages. The most frequent languages were Arabic, Mandarin, Vietnamese, Turkish, Cantonese, Korean, Dinka and Greek.
- There were 120 countries represented as women's countries of birth.
- Telephone analysis in 2005 – 06 indicated that about 25,000 attempts were made to contact PAS Intake that year. We were able to respond to about 12,000 calls.
- PAS intake occasions of service including all telephone calls and face to face contacts include 9,000 to 12,000 per year.
- There are around 5000 to 7000 new contacts from individual women each year, and about 3000 terminations of pregnancy through the PAS pathways.
- All women speak with a counsellor by phone or in person prior to making clinical or other appointments and can receive a range of services according to their individual needs.

Table 42: Pregnancy counselling sessions

	1999	2000	2001	2002	2003	2004	2005	2006
Pregnancy options counselling sessions	879	968	1218	756	873	814	732	850

Data Source: PAS Database

Table 43: Termination of pregnancy summary

	1999	2000	2001	2002	2003	2004	2005	2006
Terminations of pregnancy prior to 20 weeks								
< 5 Weeks	0	1	1	0	0	1	1	1
5-13 Weeks	3352	3302	3110	3189	2905	2817	2763	2731
14-19 Weeks	335	285	271	283	266	275	208	246
Unspecified	21	34	12	2	8	13	5	48
Total	3708	3622	3394	3474	3179	3106	2977	3026
Terminations for fetal anomalies prior to 20 weeks								
< 5 Weeks	0	0	0	0	0	0	0	0
5-13 Weeks	21	14	23	11	22	15	14	7
14-19 Weeks	69	66	57	50	54	56	51	70
Unspecified	1	1	0	0	0	0	0	0
Total	91	81	80	61	76	71	65	77

Data source: VAED

In addition to these services:

1. The Women's also provides support and advocacy for women's sexual and reproductive rights as a key philosophy of service.
2. Staff from the PAS Intake, clinical and medical pathways are frequently contacted by a range of health professionals and organisations for consultancy, practice related advice, training and other professional resourcing related to the provision of unplanned pregnancy and abortion services.
3. PAS undertakes formal research into unplanned pregnancy and abortion related issues from the perspectives of social, medical, clinical and public health.

In September 2004, the Royal College of Obstetrics and Gynaecology (RCOG) in the UK published an updated Evidence-Based Clinical Guideline that includes service delivery standards and information about complication rates. RCOG recommends that 'ideally all women undergo the abortion within seven days of the decision to proceed being agreed; and 'as a minimum standard within two weeks'. We used these standards to review our service.

The audit showed that:

- Ninety nine percent (99%) of public patients in the first trimester had their procedure within two weeks of attending clinic (88% within 7 days)*.
- Ninety nine percent (99%) of public patients in the second trimester had their procedure within two weeks of attending clinic (93% within 7 days)*.
- Surgical terminations had a low complication rate, consistent with data quoted in the 2004 RCOG Guidelines.
- The majority (over 97%) of surgical terminations were performed on a day-case basis (no overnight stay).
- All public patients were offered a follow-up appointment.

*These figures include women who asked to reschedule surgery.

Hospital-wide clinical services

The Women's acknowledges the following contributors to this section and thanks them for their contribution and partnership in producing this report.

Service area	Contributors
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Pharmacy	Ms Swee Wong
Pathology	Ms Brenda White
Radiology	Mr Jason Geddes, Dr Andrew Dobrotwir
Ultrasound	Dr Mandy Sampson
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Emergency	Ms Carolyn Looney, Dr Melinda Truesdale
Consumer Advocate	Ms Caroline Rose, Ms Kate Nicholls
Physiotherapy	Ms Margaret Sherburn
Aboriginal Women's Health Business Unit	Ms Marika Kalargyros
Women's Social Support	Ms Lisa Lentini-Shortland
Centre Against Sexual Assault	Ms Helen Makregoirgos
Language Services	Ms Karella de Jongh
Dietetics	Ms Marg Darcy
Pastoral Care and Spiritualty	Ms Christine Meese

Hospital-wide clinical services

Anaesthetic Services

The Women's provides anaesthetic care for approximately 12000 surgical procedures per year. Over the period 1999-2006 there has been a significant growth in inpatient surgery and day of surgery admissions. In 1999 18.5% of procedures were on inpatients compared with 37.3% in 2006. This growth has largely been due to increasing numbers of caesarean sections as well as major gynaecological procedures and gynaecology oncology care.

By 2006 the vast majority of surgical inpatients, including elective caesarean sections, were admitted on the day of surgery. This has been accompanied by a corresponding rise in preadmission clinic activity.

Approximately 90% of caesarean sections are carried out under regional anaesthesia. The rate of general anaesthetic (GA) for caesarean section has been gradually declining. The rate in 2006 was 6% that compares favorably with other tertiary referral obstetric centres. The rate of failed intubation during GA for caesarean section during the period was approximately 1 in 2-300. All failed intubations during the period were managed with a laryngeal mask without any major sequalae.

The majority of GA for caesarean section was carried out for category 1 or code green caesarean sections. Within a four grade scale of urgency for caesarean section, category 1 denotes an immediate threat to the life of the mother or fetus. In July 2000 a new system (code green) was introduced to the Women's to facilitate the process for category 1 caesarean sections. There was a marked increase in category 1 caesarean sections during the period from 22 in the 2000/2001 financial year to a peak of 182 in the 2005 calendar year. The National Sentinel Caesarean Section[2] audit in the UK predicted that 8% of emergency caesarean sections would be category 1 but found that 16% were so classified. By 2006, despite a significant increase in emergency caesarean sections, the proportion of code greens had fallen to 12% at the Women's.

A technological innovation during the period has been the use of Bispectral Index (BIS)[3] monitoring. The Women's was a research site for the B aware trial investigating the use of BIS monitoring to reduce the risk of awareness in high risk cases. Since 2003 BIS monitoring has become part of our standard for monitoring during GA caesarean section.

Table 1: Anaesthesia and caesarean section summary – financial years [1]

	2000-01	2001-02	2002-03	2003-04	2005	2006
Caesarean section (n)*	na	1521	1380	1638	1652	1822
Code green (n)**	44	71	112	170	182	148
Emergency (%)***	63	71	69	69	66	69
General anaesthetic (%)	11	10	9	9	9	6

Data source: HAS (Hospital Administration Software) and anaesthetist audit data
**All caesarean section data includes out of hours caesarean sections from Frances Perry House.*
***Emergency caesarean sections are graded according to an international code from category 1 (within 24 hours) to Category 4 (code green stat)*
****Emergency in HAS is defined as a non booked patient and in this case refers to emergency caesarean sections*

Acute Pain Management

The acute pain service undertakes about 2500 patient reviews per year. The majority of these are for pain management after caesarean section, then major gynaecology and gynaecology-oncology cases.

Table 2: Summary of patient reviews for pain management

	1999	2000	2001	2002	2003	2004	2005	2006
APS patient reviews	1715	2115	2327	2556	2080	2186	2269	2446
Major oncology cases	222	182	168	170	141	194	209	257
Post op epidural analgesia	197	186	125	104	73	53	15	35

Table source: HAS (Hospital Administration Software)

[1] *Popham P, Buettner A, Mendola M. Anaesthesia for emergency caesarean section, 2000-2004 at the Royal Women's Hospital, Melbourne, Anaesthesia & Intensive Care 2007, 35 74-9.*

[2] *J Thomas, S Paranjothy Royal College of Obstetricians and GynaecologistsClinical Effectiveness Support Unit. National Sentinel Caesarean Section Audit Report. RCOG Press; 2001.*

[3] *Myles PS., Leslie K., McNeil J., Forbes A., Chan MT., Bispectral Index monitoring to prevent awareness during anaesthesia. The B-Aware randomised controlled trial. The Lancet. 363 (9423): 1757-63, 2004.*

Table 3: Epidural anaesthetic in labour

	1999	2000	2001	2002	2003	2004	2005	2006
Number of women	1297	1410	1288	1181	1260	1384	1462	1531
Rate (%)	26	27	26	25	26	26	25	26

Data source: ROBIN and Labour Ward Anaesthetic Database
Only includes epidurals for labour and not any other procedure.

The most significant trend over the period has been the decline in the use of epidurals for postoperative analgesia. Epidurals were used most commonly for major oncology cases. Since 2001 there has been a significant change in practice as a result of the MASTER trial[4]. This was a large Australian RCT investigating the influence of epidural analgesia on a range of outcomes following major surgery. The results of this trial were widely discussed in Australia in 2001 and were published in the Lancet in 2002. The trial found no overall benefit for mortality or major morbidity when epidural analgesia was used. This result, combined with concerns about the risks of regional analgesia when low molecular weight heparins are being administered, has led to a significant local change of practice. Multimodal analgesia combining regular paracetamol with NSAIDs and opioids usually administered via morphine PCA has become the most common technique.

Pain management in labour

The rate of epidural analgesia has been consistent at approximately 26% during the report period. Between 40 and 50% of primiparas receive epidural analgesia but the rate for multiparas is much lower.

There has been a significant change in the technique of epidural analgesia during the period. The concentration of local anaesthetics used to achieve analgesia has been decreased over time. The purpose of this is to preserve mobility and decrease the motor block associated with higher local anaesthetic concentrations. This is in accordance with international trends, with studies such as the COMET trial[5] demonstrating a decrease in the need for instrumental vaginal delivery when lower local anaesthetic concentrations were used. This change has not resulted in any decrease in maternal satisfaction with the quality of epidural analgesia for labour which remains high.

Other techniques such as combined spinal epidural (CSE) are used much less commonly in our practice. CSE is used in approximately 5% of cases. It is used more frequently when an epidural requires resiting due to block failure. 2% of epidurals required resiting during this period.

Patients receiving regional anaesthesia in labour are followed up by the acute pain service prior to discharge wherever possible. This is to assess satisfaction with quality of analgesia for labour and delivery as well as to look for the presence of major complications of regional blocks. There have been no major complications such as epidural abscess or haematoma in over 10000 epidural anaesthetics administered during this period. The most common significant complication is post dural puncture headache (PDPH) due to accidental dural puncture. This occurred with a frequency of between 1 to 1.5% during the period. This is consistent with data from large international studies such as the UK NOAD (National Obstetric Anaesthetic Database). More than half of these were unrecognised at the time of epidural insertion. To improve the management of these patients a prospective audit/management plan was introduced in April 2004.

In 2001 the Women's became the first Victorian hospital to introduce Patient Controlled Epidural Analgesia (PCEA) in labour. The aim was to reduce the rates of staff intervention necessary to maintain epidural analgesia and to decrease total drug utilisation. The introduction of PCEA reduced the epidural supplementation rate from approximately 50% to 10%. By 2006 PCEA was used to maintain analgesia almost exclusively.

Admissions to High Dependency Unit

The High Dependency Unit (HDU) was originally set up to provide care primarily for major oncology cases. It is a 4 bed unit located on the oncology ward. It allows for invasive monitoring, respiratory support via CPAP but has no provision for mechanical ventilation, inotropic support or advanced cardiovascular monitoring. The average length of stay is less than 2 days.

[4] *Peyton PJ, Myles PS, Silbert BS, et al., and the MASTER Anesthesia Trial Study Group. Perioperative epidural analgesia and outcome after major abdominal surgery in high risk patients. Anesth Analg 2003; 96: 548–54.*

[5] *Comparative Obstetric Mobile Epidural Trial (COMET) Study Group UK. Effect of low dose mobile versus traditional epidural techniques on mode of delivery: a randomised controlled trial. The Lancet 358 (9275): 19-23, 2001.*

Table 4: Adult admissions to HDU by specialty

	2000	2001	2002	2003	2004	2005	2006
Oncology Admission to HDU (%)	49	36	44	34	30	32	31
Gynaecology admission to HDU (%)	15	20	10	18	20	15	26
Obstetrics admission to HDU (%)	17	20	29	25	24	40	38
Adult transfers from HDU to external ICU (n)	NA	NA	8	12	14	7	6

Data source: HAS (Hospital Administration Software)

Table 5: Incidence of ovarian hyperstimulation syndrome

	2003	2004	2005
Incidence	0.1%	0.5%	0.1%
Number of women	3	15	3
Cycles	2691	2731	2621

Over the report period the casemix of HDU admissions has changed significantly. The proportion of obstetric admission has risen and in 2005, for the first time, outnumbered admissions from oncology. This is most likely due to the increase in obstetric admissions generally at the Women's plus the increasing prevalence of obstetric co morbidities particularly obesity and advancing maternal age.

The obstetric causes for admission are most commonly post partum haemorrhage or complications of hypertensive diseases of pregnancy. Most admissions occur postoperatively after emergency caesarean section.

During 2004, an increased number of admissions for severe Ovarian Hyperstimulation Syndrome (OHSS) was noted (17 admissions compared to 3 during 2003). Identification of the increased incidence came from a number of sources:

- monthly review of High Dependency Unit data
- incident reporting
- discharge record audits
- Reproductive Biology Unit medical staff

A change in the formulation of one of the gonadotrophin hormones used in the process of inducing ovulation was identified. This more potent formulation meant that the dose used to produce ovulation could be reduced. Now patients at higher risk of OHSS are observed more closely. Embryo transfers, which previously may have precipitated or increased the severity of OHSS in these high risk patients, are more likely to be postponed.

Comparison of our experience is very difficult due to the rarity of this syndrome and the lack of data published by reproductive biology units.

Transfers to intensive care units (ICU) from HDU are in the order of 5-6% per year. These are usually due to a requirement for mechanical ventilation, renal support or for access to multidisciplinary care unavailable in a specialist obstetric and gynaecological hospital. On average between 10 and 20 patients are transferred from the Women's per year for ICU care. Obstetric admissions comprise between 50 and 60% of these. Once again haemorrhage and hypertensive disorders are the commonest obstetric reasons for ICU admission.

Infection Control

The Infection Control team works with the clinical staff identifying infection control issues across the hospital and developing and reviewing evidenced based policies and procedures that reflects national and international standards. The team also reviews hospital acquired infection rates and trends by conducting surveillance for neonates, maternity and gynaecological services. Staff are supported through the infection control education programs and a staff health service for immunisations and management of staff injuries such as needle sticks.

Victorian Nosocomial Infection Surveillance System

The Victorian Nosocomial Infection Surveillance System (VICNISS) is a Department of Human Services funded coordinating body, which is responsible for the collection, analysis and aggregation of infection rate data from metropolitan public hospitals using Centre for Disease Control (CDC) National Nosocomial Infection Surveillance System (NNIS) definitions.

We submit data on neonatal blood stream infections, caesarean section, mastectomy and hysterectomy wounds. The coordinating body then reports how we compare with similar hospitals. Determining these rates is a method of monitoring the effectiveness of our current standards as well as identifying any additional interventions needed to further reduce infection rates.

Neonatal Intensive Care

The infection control nurse consultants collect data to determine rates of central and peripheral line-related bloodstream infections in high-risk neonatal patients. We benchmark our rates with other hospitals in Victoria (VICNISS), Australia (ANZNN) and the world (United States CDC-NNIS). Bloodstream infections related to the presence of central lines carries significant morbidity and mortality and keeping these rates as low as possible is a major focus of the Neonatal Intensive Care Unit (NICU). The table below shows that our rates are within the 95% confidence intervals for the VICNISS and United States CDC-NNIS benchmarks.

Table 6: Central line associated bloodstream infections stratified by birth weight.

Birthweight category	RWH infection rate per 1000 line days	95% Confidence interval	VICNISS Aggregate Rate per 1000	95% Confidence interval	United States CDC NNIS	90% Confidence interval
< 750 grams	18.5	11.8 – 27.5	14.8	10.6 – 20.2	–	–
751 - 1000 grams	9.4	5.0 – 16.1	8.8	5.7 – 12.9	–	–
1001- 1500 grams	6.5	2.4 – 14.1	5.0	2.4 – 9.2	5.4	0 – 12.2
1501 - 2500 grams	0.0	0.0 – 10.2	4.6	2.1 – 8.8	4.1	0 – 8.9
> 2500 grams	0.0	0.0 – 7.9	4.7	2.9 – 7.4	3.5	0 – 7.4

Data source: Cumulative VICNISS data April 2004 to March 2007; CDC-NNIS data January 2002 to June 2004.

The table below shows trends using the Australian and New Zealand Neonatal Network (ANZNN) data. The VICNISS and ANZNN data sets use different definitions of sepsis, hence the differences in figures, but they provide important trend information and indicate which groups of neonates experience the highest rates of infection during their admission.

Table 7: Proportion of babies experiencing one or more episodes of infection

Gestational Age	ANZNN Benchmark 2000	ANZNN Benchmark 2004	RWH 2000	RWH 2002	RWH 2003	RWH 2004	RWH 2005	RWH 2005
< 28 weeks	41.9%	36.5%	53.4%	41.2%	38.8%	29.9%	21.0%	26.0%
28 – 36 weeks	8.6%	6.4%	9.9%	5.6%	2.4%	5.9%	5.0%	1.8%
> 36 weeks	7.3%	5.4%	4.8%	1.4%	0.4%	1.6%	0.1%	0%
Total	13.6%	10.3%	n/a	n/a	1.6%	6.8%	6.3%	6.4%

Data source: ANZNN Reports and Cartwright database with exclusion of contaminants (as per Infection Control)

Trends in infection rates over time provide the most useful information on the success or otherwise of standard hospital practices. In infection prevention, many small improvements add up to a large effect and to this end a Neonatal Infection Review Committee meets regularly to discuss interventions and make recommendations about policies and procedures, use of skin antiseptics and antibiotics, equipment processing and auditing, to mention a few areas. There has been a steady decrease in overall late-onset infection rates in the NICU from 5.8 infections per 1000 live in-born babies in 2002 to 3.5/1000 in 2005, a 40% decrease over that time.

Surgical Site Infection Surveillance

Post-operative surgical site infections (SSI) are amongst the most common hospital-associated infections. The most frequently performed procedures at the Women's are caesarean sections and hysterectomies, and prospective wound surveillance is undertaken for these infections in addition to mastectomy and episiotomy wounds.

We rely on multiple hospital databases, such as those maintained by Operative Services, to determine denominator rates, prophylactic antibiotic prescribing practices and to identify risk factors. Infections are ascertained through the Pathology database and by review of patient records. Infection rates are benchmarked through VICNISS and other sources when available. It is important to risk adjust the data to provide meaningful comparison, as many of our patients have significant co-morbidities that place them at increased risk of complications such as infection. Data is adjusted according to length of hospitalisation, duration of procedure, Australian College of Anaesthetists and American Society of Anesthesiologists Classification of Physical Status scheme (ASA score), wound type and procedure type (emergency or elective), height and weight and volume of blood loss.

Hysterectomy surveillance

Data is available on women undergoing abdominal and vaginal hysterectomies between 2003 and 2006. There is no formal post-discharge surveillance, but women re-presenting to the hospital with infections are captured. The data is risk-adjusted according to the presence of underlying factors that might increase the chance of infection. The rates shown in Table 3 vary considerably due to the small number of procedures in each category, but the rates remain within acceptable ranges. Note that a rate of zero means that no infections occurred in that reporting period. Confidence intervals for each data point are not included.

Table 8: Hysterectomy Infection rates per 100 procedures and by level of risk

Hysterectomy Type	Risk Category	2003 Q3	2004 Q2	2005 Q1&2	2006 Q1&2	VICNISS Aggregate	VICNISS 95% CI	CDC -NNIS	90% CI
Abdominal	0	2.9	0	2.3	1.3	1.2	0.6 – 2.1	1.4	0 – 3.4
	1	20.0	0	13.3	3.6	5.0	2.5 – 8.8	2.3	0 – 4.7
	2	0	0	0	0	3.7	0.1 – 19.0	5.2	0 - 9.9
Vaginal	0	0	0	2.5	7.4	1.7	0.5 – 4.3	1.3	0 – 3.9
	1	33.3	0	0	0	1.1	0.8 – 5.8		
	2	0	0	0	0	0	–		

Data Source: VICNISS Quarter 1, 2007 report and NNIS System Report October 2004

Another important way to examine infection rates is by the anatomical site of infection. Superficial wound infections are less significant than deeper wound infections which often require surgical exploration and drainage. Infectious complications of vaginal hysterectomy are considered as deep organ space infections, but are most commonly at the vaginal cuff. Infection rates according to infection type are shown in Table 4.

Table 9: Hysterectomy Infection rates, by infection type per 100 procedures

Hysterectomy Type	Superficial wound infection		Deep wound infection		Organ space infection		Total surgical site infection	
	2005	2006	2005	2006	2005	2006	2005	2006
Abdominal	1.8	2.7	1.4	0	0.5	2.0	3.6	4.7
Vaginal	–	–	–	–	0.8	6.9	0.8	6.9
Total	1.2	1.8	0.9	0	0.9	3.6	2.6	5.4

Data Source: Infection Control Department

Antibiotic prophylaxis for hysterectomy

Antibiotic prophylaxis is administered to women during their surgical procedure to reduce the incidence of wound infection. Usually only a single dose is required and this will reduce infection rates by at least 50% for selected procedures. In 2004-05, 86% of women received appropriate antibiotics during their hysterectomy. Antibiotics must also be given in the correct dose and at the correct time. In 2004-05 the overall infection rate in women who received antibiotics was 1.7% compared with 8.7% in those who did not receive antibiotics, a significant increase. An education program increased antibiotic prescribing to 94% in 2006.

Urinary tract infections and hysterectomy

Indwelling urinary catheter associated infections in women undergoing hysterectomy occasionally occur as catheters remain in-situ for a short period following the procedure. The urinary tract infection (UTI) rate in 2005 was 3.8% and in 2006 was 4.7%. The CDC benchmark for short-term urinary catheters is less than 5%, and published data suggests rates as high as 10.9% for abdominal procedures and 31% for vaginal hysterectomies. There is a trend towards laparoscopic procedures, so there may be a further fall in UTI rates in the future as hysterectomies performed in this fashion have a lower rate of complications.

Caesarean Section surveillance

Prior to the establishment of VICNISS, caesarean section surveillance was undertaken to allow comparison with United States CDC-NISS definitions. The comparative infection rates for caesarean sections from 2001 to 2006 are shown in the figure below. There has been a trend to reducing infection rates over this six-year period. Infections are generally more common in emergency or non-elective procedures, and this is reflected in our data. There has been a significant reduction in infections in elective or planned cases which has been sustained for the last two years. This is due to a number of factors including optimization of surgical practices, post-operative care and antibiotic prophylaxis.

Figure 1: Comparative caesarean section surgical site infection rates, 2001- 2006

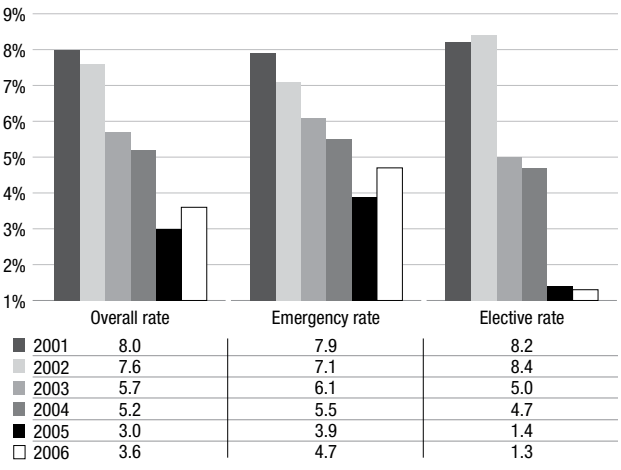


Table 10: Infection rates by emergency and elective caesarean section

Caesarean Sections	2001	2002	2003	2004	2005	2006
Overall wound infection rate	8.0%	7.6%	5.7%	5.2%	3.0%	3.6%
Monthly range	4.1 - 9.4%	3.5 - 12.7%	3.6 - 10.6%	1.9 - 8.3%	0.8 - 5.1%	2.5 - 5.0%
Emergency rate	7.9%	7.1%	6.1%	5.5%	3.9%	4.7%
Elective rate	8.2%	8.4%	5.0%	4.7%	1.4%	1.3%

Data source: VICNISS and Infection Control Department

Antibiotic prophylaxis for caesarean section

Administering a single dose of intravenous antibiotic at the time of cord cutting is a long established technique which reduces postoperative wound infection by at least 40%. We have had a particular focus on optimizing antibiotic prescribing over the last several years and the data below shows the increase in the proportion of women who were prescribed appropriate antibiotics and contrasts this with the falling wound infection rates over this time.

Table 11: Prophylactic antibiotic prescribing for caesarean section

Year	Data set	Overall infection rate %	Antibiotic prophylaxis %
2001	Jan - Dec	8.0	93.6
2002	Jan - Dec	7.6	92.8
2003	Jan - June	5.7	N/A
2004	April - Sep	5.2	96.7
2005	July - Dec	3.0	98.4
2006	July - Dec	4.6	98.8

Data source: Infection Control Department

Urinary tract infections and caesarean section

Most UTIs following caesarean infection are related to the short-term placement of an indwelling urinary catheter. These must be inserted using strict aseptic technique and UTI in emergency procedures is usually higher than in elective procedures. This is reflected in our data, although there has been a statistically significant trend to reduced UTI rates in all categories. A rate under 1% is considered very low in this population of patients and this has been achieved over the last three years.

Table 12: Comparative UTI infection rates by procedure type

Procedure	2001	2002	2003	2004	2005	2006
Emergency	2.6%	1.9%	1.5%	0.4%	0.8%	0.3%
Elective	0.6%	1.6%	0.4%	0.2%	0%	0%
Overall	1.9%	1.8%	1.1%	0.3%	0.5%	0.3%

Data source: Infection Control Department

Breast surgery surveillance

Infection data is collected intermittently on mastectomies and a wide range of other surgical breast procedures. Data was collected between April and June 2005 and April and June 2006. No infections occurred in a total of 156 patients over these periods.

Multi-resistant organism surveillance

Multi-resistant bacteria remain uncommon in our patient population. Controlling inappropriate antibiotic use with an approval system for restricted agents, maintaining high rates of prophylactic antibiotic prescribing, keeping urinary catheterization periods as short as possible, adhering to standard precautions and maintaining high compliance rates with hand hygiene all contribute to keeping transmission and infection rates low. The absence of resistant organisms in Oncology and the NICU allows us to treat infections more easily.

We have experienced occasional clusters of infection with extended spectrum beta-lactamase (ESBL) producing gram negative bacteria, vancomycin resistant enterococci (VRE), serratia marcescens, viruses such as parainfluenza and methicillin resistant staphylococcus aureus (MRSA). Screening, cohorting and meticulous compliance with infection prevention strategies has limited transmission of these organisms and none have become endemic in the hospital. Both typical hospital multi-resistant strains and community non-multi-resistant strains cause up to 10 MRSA infections per year, but the majority of these are acquired outside of the hospital either in the community or at other institutions.

Table 13: MRSA infections by acquisition and resistance pattern

Year	Total	Hospital acquired	Community acquired	External hospital MRSA	Unknown acquisition	Multi-resistant MRSA	Non-multi-resistant MRSA
2005	8	0	7	1	0	1	7
2006	10	0	4	1	5	5	5
2007	1	0	0	0	1	1	0

Data source: Infection Control Department

Pharmacy Services

The Pharmacy provides an evidence-based pharmaceutical service. We promote the quality use of medicines through research, education and information provision to all patients, carers and staff of the hospital. We have implemented the National Inpatient Medication Chart at the Women's.

Clinical services provision includes:

- Review of medication charts with recommendations and interventions as appropriate for the inpatients. Since 2005 interventions by pharmacists are recorded on the portable data entry device (PDAs). Interventions are risk assessed, classified and analysed each month. These are then reviewed and monitored by the Medication Safety Committee. Extreme risk issues include prescription of medications to which an allergy is documented while high risk issues might include wrong dosages and timings and reconciliation issues.
- Review and dispensing of prescriptions for the outpatients with counselling and provision of information to the patients.
- Involvement in the risk management activities of the hospital – medication safety committee, adverse drug reactions committee, reports to the Quality and Safety Committee, (about 100 ADR reports a year and approximately 1000 interventions a year). From the data collected, themes are identified that require education sessions from pharmacists to raise awareness and further information may need to be disseminated within the clinical areas.

Specialist drug information is also provided:

- Information on the specialised topics of medications used during pregnancy and breastfeeding, in neonatal care and in gynaecology (approximately 4,000 queries a year)
- Information to patients referred to the genetic clinics, together with the geneticists or the counsellors (approximately 30 cases a year – new initiative commenced in 2005).
- Information brochures regarding specific medication use.
- Publications including the Drugs and Pregnancy guide (2001), the Drugs and Breastfeeding guide (2004) and the Neonatal Pharmacopoeia (2005).

The Pharmacy manufactures specialised sterile and non-sterile items for the hospital (over 10,000 sterile items and 2,500 non sterile items a year) e.g. total parenteral nutrition for the Neonatal Intensive Care Unit and epidural solutions.

Pathology

Table 14: Pathology occasions of service

	1999	2000	2001	2002	2003	2004	2005	2006
Pathology	57236	49707	47997	51159	53355	51577	51467	53484

Data source: VACS

Pathology services are contracted from the Royal Children's Hospital across 24/7. Specialised services include:

- Anatomical pathology reporting and clinical liaison, including frozen sections, perinatal autopsies and mortuary services.
- Consultant infection control and molecular microbiology services.
- Semen analysis and banking.
- Provision of specialised haematology clinics and other consultant clinical haematology services.

Improvements in services include:

- Implementation of an on-line specimen collection manual which includes information relating to specimen type and volume, the testing laboratory and the assay frequency.
- The re-establishment of in-house anatomical pathology and non-gynaecological cytology services with specialist anatomical pathologists.
- Appointment of a paediatric pathologist who specializes in neuropathology and is able to provide expertise in this aspect of perinatal post mortem reporting.
- Implementation of testing for DNA ploidy by flow cytometry to assist hydatidiform mole diagnosis.
- Implementation of immediate release of compatible red cells for patients who have had a blood group and negative antibody screening test within the last 72 hours.

- Implementation of fetal maternal haemorrhage quantitation by flow cytometry.
- Implementation of molecular testing methods for chlamydia which facilitates daily testing and faster turn around times.
- Introduction of molecular testing of cervical swabs for mycoplasma genitalium for diagnosis and also for monitoring treatment failure due to antimicrobial resistance.

Radiology

Table 15: Radiology occasions of service

	1999	2000	2001	2002	2003	2004	2005	2006
Radiology	1550	1499	1558	1562	1771	1602	1783	2522

Data source: VACS

The Radiology Service is a multi-disciplinary 24 hour service providing general adult, paediatric and neonatal radiology, a wide range of fluoroscopic procedures, general and neonatal ultrasound, computered tomography and mammography, including diagnostic and interventional procedures. Also provided are bone densitometry and an image intensifier service for any procedures performed in operating theatre. Recently our service expanded to include digital mammography and highly accurate stereotactic biopsies of breast lesions.

The Radiology Service provides the following specific Women's services:

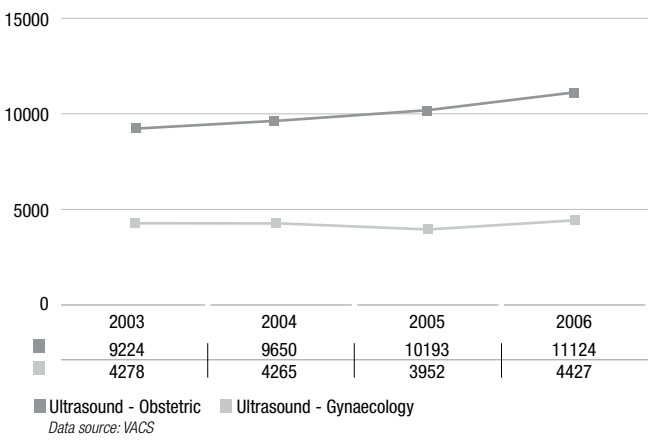
- Ultrasound guided removal of implanon devices
- Stereotactic guided biopsies of suspicious mass lesions of the breast under direct mammographic guidance
- Hook needle localisations of suspicious breast masses in preparation to excise in theatre
- Ultrasounded or CT guided drainage of ascites, and biopsies of a variety of mass lesions in oncology patients
- CT Pelvimetry to assess the pregnant patient's viability of a vaginal delivery
- Hysterosalpingograms to assess the patency of fallopian tubes
- Bone density scanning of women to assess the increase in fracture risk due to osteoporosis

Ultrasound Services

The increased numbers of women having babies has been reflected in the increasing demand for ultrasound services with a 15% increase in services between 2003 and 2006, and a 32% increase in services since 1997. This increase has been mainly in obstetric scans, with increasing complexity and frequency of scans needed for the optimal management of high-risk women. All women are offered a mid-trimester anomaly scan and more than 50% are performed in the Ultrasound department.

There has been a decline in the number of prenatal diagnostic procedures with many women taking the opportunity to have first trimester screening in the private sector. This has lead to fewer procedures such as CVS or amniocentesis in the whole of Victoria. Within our service the main indications for an amniocentesis or CVS are maternal age, DNA testing, fetal abnormality on US, or high risk screening results. First trimester screening is currently only offered to women with multiple pregnancies and diabetes.

Figure 2: Ultrasound occasions of service



Data source: VACS

The numbers of intrauterine transfusions is also in decline due to better prophylaxis against Rh disease, and the use of Intragam, which appears to delay the onset of anemia. The use of MCA Doppler to assess anemia has reduced the number of fetal blood samples performed per fetus per pregnancy from an average of 5.3 in 2003 to an average of 2 in 2006, thus significantly reducing the risk to the fetus from invasive procedures.

In 2003 a new reporting system (Viewpoint) was introduced, with reporting stations in each scan room. The ultrasound machines now link directly into the reporting station with less error of transcription in the reports. It is now possible to audit with more certainty that the figures are correct. It has also allowed the reporting of scans performed outside the department eg in Emergency Department. This has lead to a decrease in informal handwritten reports in patient outpatient notes. Once entered into Viewpoint the report becomes available for viewing on CLARA. In 2006 there were 3335 scans performed outside the Ultrasound Department and reported into Viewpoint. It is intended that all scans performed outside the department will be formally reported into Viewpoint once the credentialling process is complete.

In addition to the purchase of new equipment, improvements in services include:

- Involvement in establishment of an Early Pregnancy Assessment Service (EPAS).
- Introduction of sonographers into the department. Senior staff will be allocated to a supervisory and teaching role across the department, day care centre, other clinics and EPAS. This is currently being implemented and is expected to be completed by 2008.
- Development of an Ultrasound Credentialing Program across all areas of the hospital. The credentialing process for EPAS has begun and will be finalised in 2007. Other areas of credentialing will include gynaecology scans and third trimester growth scans and will be developed in 2008.

Mental Health

Increasingly it has been recognised that good mental health is fundamental to the wellbeing of individuals, their families and the whole population. Five of the ten leading causes of disability worldwide are mental disorders, with depression being the most significant of these. At the Women's, we are developing our mental health services following increasing demand.

Table 16: Mental health occasions of service

	2004	2005	2006
Inpatient referrals to Consultation Liaison Service	176	153	154

Data source: Consultation Liaison database

In 2006 the Women's received DHS/Philanthropic funding to establish a comprehensive Centre for Women's Mental Health in Victoria. Three key areas of concern support the need to specifically address mental health problems of women:

- gender is one of the main sources of social, psychological, cultural and economic inequalities in modern societies
- there are acknowledged characteristics of the assessment, treatment and management of mental health problems specific to gender
- targeted gender focused work as necessary to ensure delivery of appropriate mental health care.

The Centre will provide clinical and therapeutic services for women within a population health framework that takes into account the complex influences on mental health and encourages a holistic approach to improving mental health and wellbeing. The Centre will address the mental health issues of women across the lifespan from infancy to old age and will specifically focus on the way in which physical health contributes to mental wellbeing and the effects of mental health on physical health. Although our initial focus of necessity will be on treatment of those with mental health problems, the Centre's approach will encompass the entire spectrum of interventions from prevention to recovery and relapse prevention. This recognises that prevention and promotion efforts are necessary and complementary to core clinical interventions.

In addition, the Centre will assume a leadership role in mental health research, education and the provision of evidence based resources. Professor Fiona Judd commenced at the Women's in February 2007 to provide leadership for the new Centre. In the first phase of its development, the Centre will enable expansion of the existing mental health service at the Women's. Several new team members are being recruited to expand team capacity and to ensure that comprehensive and multidisciplinary clinical care is provided.

The Centre for Women's Mental Health will develop five discrete but complementary work streams. The first meeting women's mental health needs, will focus on extending the range of services offered to outpatients and inpatients of the hospital. This work will focus on maintaining the best possible mental health and wellbeing for women by supporting mental wellbeing, preventing mental ill health and detecting and treating mental health problems/disorders. In the first instance, service development will be focused on three areas, chosen as they are times of increased mental health problems, particularly anxiety and depression: pregnancy and transition to motherhood, cancer treatment and survivorship, menopause and midlife.

A second work stream secondary consultation will provide external and internal health professionals with access to expert opinion and advice and support regarding the care of women with mental health issues. The information and resources work stream will include the development of materials to support evidence based care provision, and consumer information regarding mental health and wellbeing. Education and awareness raising will focus on improving awareness and skills amongst internal staff, external providers and the community, so that mental health needs are better identified and managed and the profile of women's mental wellbeing is raised.

The final key area of work will be research and evaluation. This stream will expand research activity in the field of women's mental health and wellbeing. It will also include the ongoing monitoring and evaluation of the work of the Centre. The research agenda will reflect the priority clinical areas described above as well as being informed by currently defined national/international research priorities and known gaps in research within the area of women's mental health. Thus, it is anticipated that the research agenda will include but not necessarily be limited to the following areas: gender and mental health; pregnancy, neonates and motherhood; psycho-oncology; menopause, midlife and mental health; ageing women's mental health; and culture and women's mental health.

Emergency Service

The Emergency Department provides clinical care for women with acute obstetric and gynaecological problems and newborns with a range of neonatal conditions. The service undertakes extensive liaising and co-ordination with varying departments within the hospital, e.g. Women's Social Support Services (WSSS), Centre Against Sexual Assault, Mental Health.

Activity

Presentations have increased by 22% since 1999. Admissions resulting from presentation have remained steady.

Table 17: Patient admissions arising from presentations to Emergency Department

	1999	2000	2001	2002	2003	2004	2005	2006
Patient presentations	22830	23650	23864	23175	27001	26349	28165	29456
Total No of admissions (including to wards and DSU)	6887	6361	5991	6038	6606	7585	8313	8164
Overall admission rate	30%	27%	25%	24%	25%	29%	30%	28%

Data source: Emergency Data Information System

Table 18: Principal reasons for presentation to Emergency

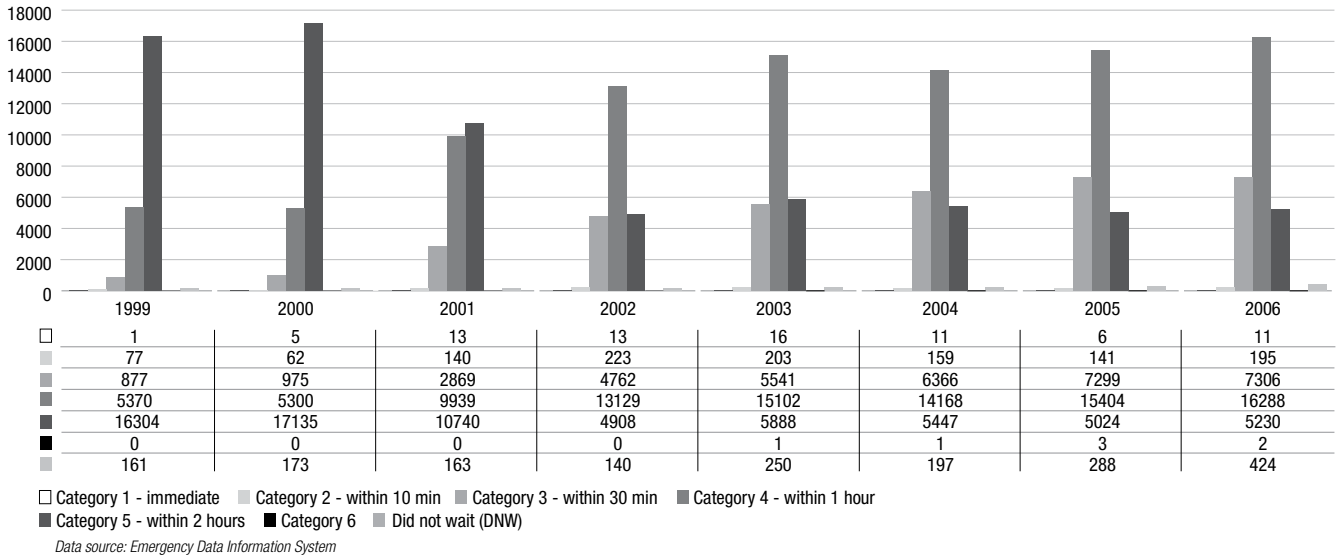
	1999	2000	2001	2002	2003	2004	2005	2006
Ectopic pregancy	1630	2493	1520	2119	2457	3339	3633	3689
Labour related	2851	3174	2804	2739	2815	3280	3726	3652
Normal pregnancy	620	707	754	897	1031	1068	1473	1470
Pelvic pain	844	960	739	1165	1167	1207	1169	1191
Ruptured membranes	na	621	na	621	689	767	916	1062
Other including APH	816	495	511	620	875	658	1237	971
Threatened premature labour or premature labour	677	na	na	na	na	667	726	751
Follow-up post treatment / results / prescriptions	2261	3509	3363	4428	4111	3949	2472	2142
Other - contraceptive management	na	811	769	1029	1129	432	293	189

Data source: Emergency Data Information System

Acuity

Triage category 3 and 4 patient presentations have increased over the last 8 years with a comparable decline in triage category 5 patients. The number of triage category 5 patients presenting has stabilised over the last 5 years. There are 'more' and 'sicker' patients generally presenting to the Emergency Department. This reflects statewide and national trends.

Figure 3: Number of patients waiting by triage category



Data source: Emergency Data Information System

Waiting Times

The majority of patients presenting to the Emergency department are seen within benchmark times.

Table 19: Percentage of patients presenting to ED meeting benckmark-waiting times

	Benchmark	1999	2000	2001	2002	2003	2004	2005	2006
Category 1- Immediate	100%	100.0	100.0	84.6	100.0	93.8	100.0	100.0	100.0
Category 2 - Within 10 min	80%	90.9	95.2	92.9	90.6	84.7	89.9	86.5	91.8
Category 3 - within 30 min	75%	94.5	94.1	91.2	89.0	87.5	88.8	87.6	86.4
Category 4- Within 1 hour		93.8	95.6	88.3	86.6	80.0	82.9	75.6	70.2

Data source: Emergency Data Information System

Table 20: Antenatal presentations and admission rate from Assessment Centre

	1999	2000	2001	2002	2003	2004	2005	2006
Antenatal presentations (n)	291	1051	1039	1028	1114	1025	1738	3581
Assessed and discharged (n)	127	427	330	332	452	407	764	1655
Antenatal Admissions (n)	164	624	709	696	662	618	974	1926
Admission rate %	56.4	52.3	59.7	58.9	53.5	55.4	54.7	53.8

Data source: Emergency Data Information System

Assessment Centre

The role of the Assessment Centre is to monitor and assess women in early labour. Women with antenatal and gynaecological conditions requiring short term treatment can also be managed. The Assessment Centre had an increase in attendances from its inception in 1998/1999. The Assessment Centre is a 24/7 service. Until 2005/6, there were some gynaecology patients treated, but the service is now predominantly maternity focused with a Clinical Nurse Specialist Midwife employed to undertake assessment of women presenting to the Emergency department in labour. The Assessment Centre has been critical in relieving the pressure for Birth Suite beds during this period.

In 2007, the Early Pregnancy Assessment Service was established to attempt to provide co-ordinated clinical care to women with bleeding and / or pain in early pregnancy, in a supportive environment. The service provides patient clinical assessment, ultrasound, and subsequent diagnosis, counselling and treatment at a single presentation. Follow up and care is co-ordinated through this clinic.

Paediatric Patients

Over the last 9 years the number of neonatal presentations has also increased. However, as a percentage of the total increase in emergency visits it has been a 1% increase overall.

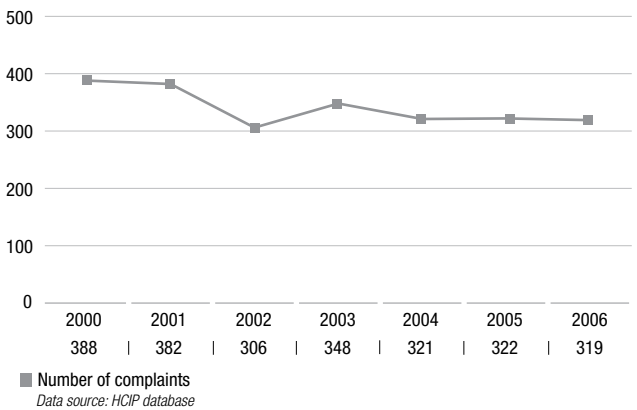
Consumer Advocate Service

The Consumer Advocate Service attends to all complaints and other feedback from consumers. The advocate works with both the patient and staff to investigate the complaint and resolve the issue to the satisfaction of all involved. In most instances, the complainant wants to be reassured that the problem will be addressed to prevent the same thing reoccurring. Often an apology or an explanation is sufficient, but occasionally compensation is sought. Complaints are also used to identify problem areas, system failures and other opportunities for improvement.

Number of Complaints

The total number of complaints received by the Consumer Advocate Service has remained quite steady. However, considering the increasing number of episodes of service provided by the hospital, this result actually represents a steady decrease in the proportion of complaints received.

Figure 4: Number of complaints

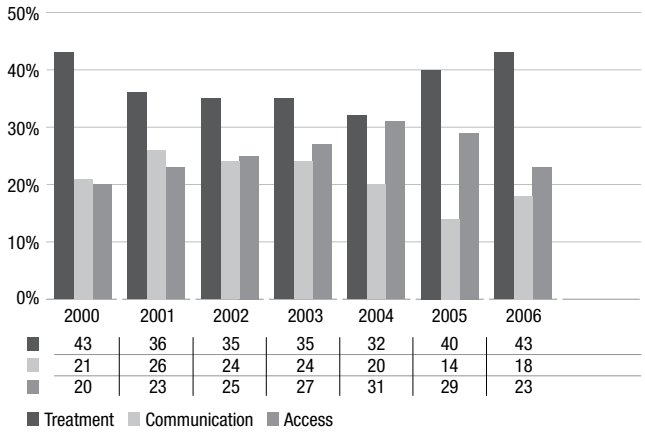


Data source: HCIP database

Issues

All complaints are categorised according to the issues of concern. These issues represent both the complainant's view of the problem as well as the advocate's perspective. Communication issues, including inadequate information and poor attitude, have consistently represented the most common area of concern at the Women's. Concerns about treatment and access to services continue to remain high. These three issues are also the most common across all hospitals in Australia.

Figure 5: Issues raised by complaints

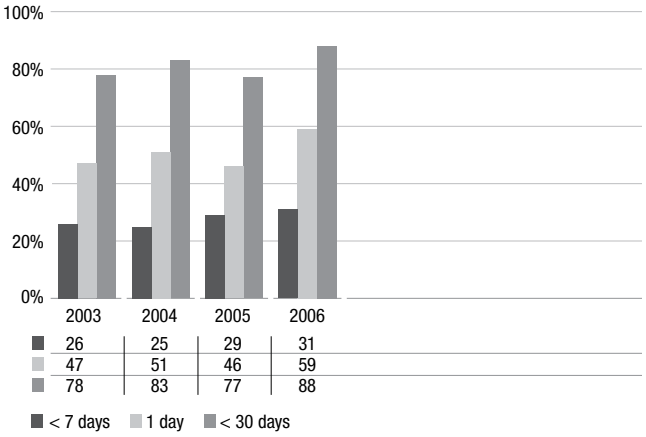


Data source: HCIP database

Number of Days to Resolve Complaints

Timeliness in resolving complaints is considered to be a major factor influencing the complainant's sense of satisfaction with the complaint process. The following graph demonstrates that there is a trend towards closing complaints sooner. Considering the benchmark is around 80-85% closed within 30 days, the 2006 figure of 88% is a pleasing result.

Figure 6: Percentage of complaints closed within timeframes



Data source: HCIP database

Allied Health

Allied Health Services provide a range of clinical and social support to women accessing services at the Women's.

Table 21: Occasions of service for major allied health services

	2002-03	2003-4	2004-5	2005-6
Dietetics	1866	2328	2469	2393
Physiotherapy	2570	2584	2572	2396
Social Work	19620	20562	21382	19855

Data source: RWH Performance Reporting data

Physiotherapy

Physiotherapy services have increased steadily over the last 5 years. A key change has been the introduction of more group sessions during 2006. In particular ante-natal back care classes have been introduced to combat the long waiting lists for outpatient appointments for pregnant women with back and pelvic joint pain. The types of groups being held include ante-natal back care, TENS for labour, and pregnancy fitness classes. Classes not conducted previously include pelvic floor exercise classes, ante-natal back care classes at Broadmeadows, plus doubling the number of TENS for labour classes to match a renewed interest in TENS as pain relief in labour. Post-natal classes are held in each post natal ward on 6 days of the week. On average 100 women per month attend these post-natal classes. Waiting list times are now down to 4-5 weeks.

Women's Social Support Service

Women's Social Support Service (WSSS) has increased its service delivery with 6,961 women offered a social work service in 2006-7 compared with 5,693 women in 2005/6. This is a yearly increase of 1,268 women or an additional 100 women a month who received a social work service in 2006/7 compared to the year before.

In 2001 Women's Social Support Services developed an Intake and Crisis System to manage the number of referrals to the department with a timely response protocol. In 2004 the department developed a Social Work On Call Service for weekends and public holidays in response to the hospital's demand for a social work service out of hours.

The majority of work is in the area of maternity, but oncology, neonatal and gynaecology units are also serviced by social workers. In 2004 the social work department reviewed its service delivery to the gynaecology unit and this resulted in a dedicated Gynaecology Social Work position being developed.

The department offers psychosocial assessment, counseling, advocacy, and information and support services to all patients of the hospital. From 2001-2004 the department supported a major research study on domestic violence that interviewed women antenatally with 27% of women reporting experience of domestic violence. WSSS has initiated numerous programs to offer emotional support to women; these have included antenatal support groups, support groups for families with babies in the neonatal unit, young mum's parenting groups as well as therapeutic art therapy programs for women in oncology.

A Neonatal Consumer Evaluation Study was conducted in 2006 with very positive feedback for the social work role in the neonatal unit.

Aboriginal Women's Health Business Unit

The Aboriginal Women's Health Business Unit (AWHBU) provides support and assistance to Aboriginal and Torres Strait Islander women and families. Support also extends to women who are not Aboriginal but who have Aboriginal or Torres Strait Islander partners or children.

Aboriginal women and their families often present with complex medical and psychosocial issues and the AWHBU workers spend a lot of time providing cultural advocacy and support.

The unit liaises between Indigenous women, the hospital, external agencies and the broader community and promotes the services at the Women's.

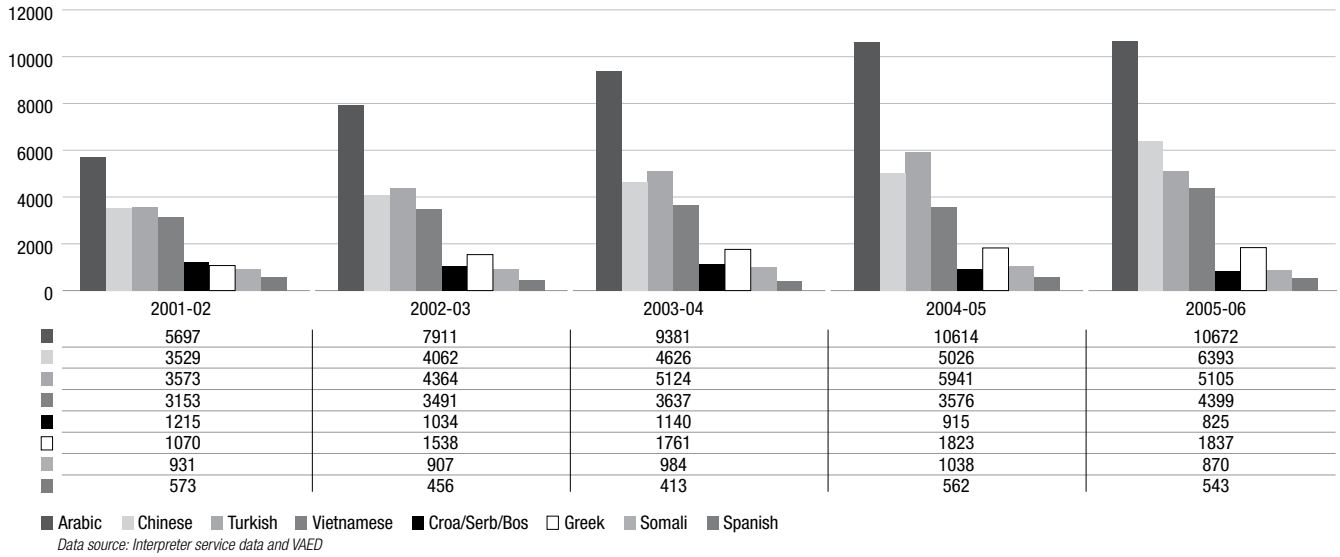
In addition, the unit provides training and education to health professionals and resources to 45 Aboriginal Health Associates at the Women's. The unit has an Aboriginal Women's Health Advisory Committee made up of approximately 12 women from Aboriginal and Torres Strait Islander communities.

During 2005 an Oral History project was commenced, which is currently in the second stage of development. The unit works to raise the profile of Indigenous health and culture and address issues of access to hospital services.

Language Services

The demand for Language Services has continued to grow with a substantial increase in Arabic and Chinese language requirements.

Figure 7: Occasion of service and language requirement



Data source: Interpreter service data and VAED

Centre against Sexual Assault (CASA) House

During 2006 the following services were provided by CASA House:

- telephone counselling, advocacy and secondary consultations to approximately 1100 service users, family and friends and health professionals.
- face to face counselling and advocacy to approximately 990 victim/survivors including crisis care, individual counselling and advocacy, shared counselling and support groups.
- 50 training workshops to a range of health professionals.
- sexual assault prevention programs for secondary schools delivered to seven secondary schools in our catchment area.

During 2005, CASA House relocated to the Queen Victoria Women's Centre in metropolitan Melbourne. Overall the feedback has been extremely positive and the accessibility of the service to service users has increased due to increased public transport access.

In 2005 a shared counselling model was piloted and this model has since been adopted as a standard model of service. The model provides counselling and advocacy to a small group of 3-4 women at one session.

A sexual assault prevention program was piloted in 2 secondary schools during 2004 and is currently delivered in 4 schools in the region as part of their curriculum. Ongoing funding for this project was received from the Department of Human Services in 2006.

We have been aware of the access difficulties for women from other culture and language groups, and geographically isolated women. In order to address these issues, CASA House established an outpost at Anglicare Family Services in Broadmeadows during 2006 and at Dianella Community Health Service in Craigieburn in 2002.

Fitzroy Legal Service has recently established a service at CASA House to assist access for victims/survivors to the Victims of Crime Tribunal and compensation.

The Statewide Sexual Assault Crisis Line has worked with the Victorian CASA Forum to initiate a statewide 24 hour 1800 number which allows women to be connected directly to a service in their region during business hours and the Crisis Line after hours. Demand for after hours coordination of crisis responses following a sexual assault has been steadily increasing with over 600 occasions of crisis care across Victoria in the last financial year.

Dietetics

The nutrition and dietetics unit provides nutritional care for all inpatients and outpatients of the hospital including our Broadmeadows community clinic. There has been a significant increase in service to the endocrine unit, diabetes unit and urogynaecology unit during recent years. Weight related issues are becoming more significant, requiring both individual and group programs.

Pastoral Care and Spirituality Services

Pastoral Care and Spirituality Services provide spiritual support, counselling, celebrations and rituals. The Sacred Space has been refurbished after consultation with diverse faith communities. In recent years, neonatal services and the oncology unit have been allocated dedicated Pastoral Care staff in order to increase the continuity of care to patients and families.

Reproductive Loss Services supports women experiencing a reproductive loss following miscarriage after 15 weeks gestation, mid-trimester termination due to genetic abnormality, stillbirth, neonatal and infant death.

A significant recent initiative has been to develop a new process for 'reviewable deaths' following implementation of legislation that required all deaths of children to be reported to Coroner. The new process will enable medical clinicians, principally paediatricians, to recommend to the Coroner that no further review of death is required eg perinatal deaths, deaths from congenital abnormalities.

Abbreviations

ACOG	American College of Obstetricians and Gynaecologists
ANZNN	Australian and New Zealand Neonatal Network
CCOPMM	Consultative Council on Obstetric & Paediatric Mortality & Morbidity
CLARA	Clinical Information and Results Acknowledgement
CTG	Cardiotocogram
DCIS	Ductal carcinoma in situ
DNA	Deoxyribonucleic acid
EUA	Examination under anaesthetic
FGR	Fetal growth restriction
GBS	Group B Streptococcus
ICD	International Classification of Diseases
IDDM	Insulin Dependent Diabetes Mellitus
IPPV	Intermittent positive pressure ventilation
LAVH	Laparoscopic Assisted Vaginal Hysterectomy
LEEP	Loop Electrosurgery Excision Procedure
LLETZ	Large Loop Excision Transformation Zone
NIDDM	Non-Insulin Dependent Diabetes Mellitus
PID	Pelvic inflammatory disease
PSANZ PDC	Perinatal Society of Australia and New Zealand
RCOG	Royal College of Obstetrics and Gynaecology
TENS	Transcutaneous Electric/Electrical Nerve Stimulation
VACS	Victorian Ambulatory Classification System
VAED	Victorian Admitted Episode Dataset

Notes