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# **Perineal Tears: A literature review**

Professor Caroline Homer AO and Dr Alyce Wilson from the Burnet Institute have prepared this report on behalf of the Australian Commission on Safety and Quality in Health Care.



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## Preface

The development of a literature review on third and fourth-degree perineal tears follows findings and [recommendations](#) made in the [Second Australian Atlas of Healthcare Variation](#) (2017) developed by the Australian Commission on Safety and Quality in Health Care (the Commission). The Atlas found the Australian rate of third- and fourth-degree perineal tears is above the reported average for comparable countries in the Organisation for Economic Cooperation and Development (OECD) <sup>4</sup> and that there was significant variation in rates across the country. In all women giving birth vaginally, the Atlas observed an overall 12-fold geographical variation across local areas in rates of third- and fourth-degree perineal tears and a 2.9 fold variation, after excluding the highest and lowest 10% of results.

The Atlas also recommended that “*the Commission work with Women’s Healthcare Australasia, and relevant colleges and specialist societies to develop a clinical care standard on perineal care during vaginal birth, to improve national consistency of best practice for the prevention, recognition and management of severe perineal trauma.*”

As an initial step in this work, the Commission engaged Professor Caroline Homer and Dr Alyce Wilson of the Burnet Institute to carry out a literature review to better understand the current clinical environment for preventing and managing third- and fourth-degree perineal tears and to identify issues or gaps that may need to be addressed.

## Key findings

The literature review finds that while there is some consistency across guidelines and the evidence on preventative practices and management of severe perineal tears, there is variation in a number of key practices. Variation is seen in the use of perineal massage, ways to slow down the birth of the baby’s head, routine episiotomy for an instrumental birth, per rectal examination following the birth and the timing of the repair.

The report notes some specific practices in Australia that should be taken into consideration. This includes forceps deliveries becoming more common than vacuum extraction over the last decade and evolving practices around perineal support during second stage labour, with hands off or hands poised approaches becoming more common as more women are giving birth upright, on their hands-and-knees or in water.

Emphasis on the diagnosis and classification of perineal tears in many hospitals may account for the higher rates recorded in Australia compared to other OECD countries, but the authors note there may also be inconsistency in this reporting across the country.

Another finding is that doctors and midwives may lack knowledge and skills in assessment and classification of perineal tears to detect and accurately classify the degree of perineal trauma. The correct classification of perineal tears helps ensure appropriate management then occurs.

The findings suggest that correct clinical assessment of perineal tears and the provision of appropriate care during the immediate postpartum period are critical to ensuring good outcomes for women who experience severe perineal trauma. The report also identifies areas where further work is indicated to facilitate development of strong evidence-based recommendations.

## Recommendations of the report

The authors of the report recommend that efforts should be made to develop a national clinical care standard that addresses prevention and management of perineal tears in collaboration with women, professional colleges and organisations and health services. Making consumer information readily available is also recommended to enable women to make clear decisions about clinical practices.

The authors also recommend improvements in the education and training of midwives and doctors in perineal anatomy and classification of perineal tears through a nationally available, standardised package or program. This would address issues surrounding the correct classification and diagnosis of the perineal injury and help guide appropriate management and ongoing care by skilled staff.

Additional recommendations to ensure patient-centred care is prioritised include enabling continuity of carer from midwives and doctors so that women feel safe and supported in the repair and ongoing management of severe perineal tears, and inclusion of women's views and preferences in all future research into the prevention and management of severe perineal trauma.

## Next steps for the Commission

The Commission will consider the report's recommendations in the context of the results of the Women's Healthcare Australasia (WHA) [National Quality Improvement Collaborative](#) (the Collaborative) on improving outcomes for women through reducing avoidable third and fourth degree tears.

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## Glossary

Accoucher	Person who 'delivers' the baby from the woman giving birth
Dehiscence	Surgical complication in which a wound reopens along a sutured surgical incision
Dyspareunia	Painful sexual intercourse
Fourth-degree perineal tear	Involves the anal sphincter and the anal mucosa (the lining of the anus or rectum)
Labour augmentation	Process of stimulating the uterus to increase the frequency, duration and intensity of contractions. Common methods include intravenous oxytocin infusion and artificial rupture of membranes.
Labour induction	The process of artificially stimulating the uterus to start labour. Usually involves administration of oxytocin or prostaglandins or by artificial rupture of membranes.
Multigravida	A pregnant woman who has had at least one previous pregnancy
Multipara	A woman who has given birth to more than one infant
Perineal trauma	Refers to any trauma to the perineum during birth and includes perineal tears, obstetric anal sphincter injuries and episiotomies.
Primigravida	A woman experiencing her first pregnancy.
Primipara	A pregnant woman who has had no previous pregnancy resulting in a live birth or stillbirth.
Primiparous	Having given birth to one child.
Routine episiotomy	A surgical cut of the vagina and perineum performed on all women undergoing vaginal birth.
Selective episiotomy	A surgical cut of the vagina and perineum performed as required on women undergoing vaginal delivery.
Severe perineal tear or trauma	Third or fourth degree perineal tear
Third degree perineal tear	Injury to the perineum involving the anal sphincter (muscle controlling the anus)

## 1. Executive summary

Severe perineal trauma, also referred to as third and fourth degree perineal tears, is experienced by a small proportion of women who give birth vaginally. Of all women who gave birth vaginally in Australia in 2016, three percent had a third or fourth degree perineal tear.<sup>1</sup> Despite the small numbers of women, it is associated with immediate and long term implications for women and health systems. The rate of severe perineal trauma in Australia is above the reported average for similar Organisation for Economic Cooperation and Development (OECD) countries and there is significant variation in rates across the country. Therefore, the Australian Commission on Safety and Quality in Health Care commissioned this literature review to examine the policies and guidelines currently influencing clinical practice across the country; and to better understand the current clinical environment for preventing and managing third- and fourth-degree perineal tears.

Eight guidelines from professional colleges, membership associations or guideline agencies were found as well as five state/territory or major hospital policies. Most of the jurisdictional and health service policies were based on the United Kingdom's Royal College of Obstetricians and Gynaecologists (RCOG) Greentop Guideline for the management of third- and fourth-degree tears. There were a number of similarities between the guidelines including the selective use of episiotomy, use of warm compresses, importance of slowing down the birth of the baby's head and the administration of antibiotics at the time of repair. The main differences were the ways to slow down the birth of the baby's head, perineal massage, routine episiotomy for an instrumental birth, the rectal examination following the birth and the timing of the repair.

In total, 26 systematic reviews were found that addressed the research questions around prevention and management of severe perineal tears. The most common risk factors are primiparity (first baby), mother's ethnicity, having a larger baby and some interventions in labour and birth. Preventative practices with varying degrees of effectiveness, often dependant on parity, included antenatal perineal massage, different maternal positions for birth, giving birth in water, protection of the perineum and doing an episiotomy for an instrumental birth. Gaps were identified in the literature especially regarding women's views and preferences.

Five key recommendations are made in relation to the findings from this review. These include:

- I.** Efforts should be made to develop a national clinical care standard that addresses prevention and management of perineal tears in collaboration with women, professional colleges and organisations and health services.
- II.** Information for women should be readily available to enable them to make clear decisions about clinical practices. Consumer information produced by the RCOG is one example that might be useful to adapt.<sup>2</sup>
- III.** Education and training of midwives and doctors in perineal anatomy and classification of perineal tears needs to occur using a nationally available, standardised package or program, preferably online. This would address correct

classification and diagnosis of the perineal type ('degree') and hence guide appropriate management and care by skilled staff.<sup>3</sup>

- IV. Continuity of care from midwives and doctors needs to be enabled so that women feel safe and supported when undergoing repair and postpartum management after severe perineal trauma.
- V. Inclusion of women's views in all future research into the prevention and management of severe perineal trauma. This needs to go beyond the simplistic measurement of 'satisfaction' using a scale and include women's perceptions of acceptability, quality, communication, choice and respect.

## 2. Background and introduction

Perineal tears are a common outcome of vaginal births. Of all women who gave birth vaginally in Australia in 2016, 24 percent had an intact perineum, 23% had a first degree tear and 30% had a second degree tear (see Box 1 for definitions).<sup>1</sup> First and second degree perineal tears usually require repair but women recover from these within the first few weeks or months after birth. These tears are not the focus of this review.

Severe perineal tears are third- and fourth-degree perineal tears (also referred to by some authors as obstetric anal sphincter injuries (OASI)), are experienced by a small proportion of women who give birth vaginally. A third-degree tear is an injury to the perineum involving the anal sphincter (muscle controlling the anus), and a fourth-degree tear involves the anal sphincter and the anal mucosa (the lining of the anus or rectum) (Box 1).<sup>4</sup>

It is essential that women experiencing third and fourth degree tears are identified and the injury appropriately repaired with follow-up and debriefing. It is also important that the maternity workforce have the skills to detect and accurately classify a tear and then perform the next correct management steps.

### Box 1: Classification of perineal tears

First-degree tear	Injury to perineal skin and/or vaginal mucosa
Second-degree tear	Injury to perineum involving perineal muscles but not involving the anal sphincter
Third-degree tear:	Injury to perineum involving the anal sphincter complex
Grade 3a tear	Less than 50% of external anal sphincter (EAS) thickness torn
Grade 3b tear	More than 50% of EAS thickness torn
Grade 3c tear	Both EAS and internal anal sphincter (IAS) torn
Fourth-degree tear	Injury to perineum involving the anal sphincter complex (EAS and IAS) and anorectal mucosa

Source: RCOG Green-top Guideline No. 29: The Management of Third- and Fourth-Degree Perineal Tears (2015)



Of all women who gave birth vaginally in Australia in 2016, three percent had a third or fourth degree perineal tear.<sup>1</sup> The most recent data from the Australian Institute of Health and Welfare<sup>1</sup> highlighted a number of associated risk factors for severe perineal trauma including maternal country of birth (women born overseas have higher rates); hospital sector (women in public hospitals have a higher rate of severe perineal trauma), and instrumental vaginal birth, especially forceps delivery.

Third or fourth degree perineal tears, if not recognised and repaired at the time, can have serious long-term consequences for women, including continued perineal pain, faecal and flatus incontinence, painful sexual intercourse, reduced quality of life and depression.<sup>4</sup> There are also significant social and emotional implications for women that affect their psychological well-being and have impacts on the family.<sup>5</sup>

In 2017, the Australian Commission on Safety and Quality in Health Care ('the Commission') conducted a review of third- and fourth-degree perineal tears as part of the *Second Australian Atlas of Healthcare Variation*.<sup>6</sup> This analysis showed that the Australian rates of severe perineal trauma were above the reported average for similar Organisation for Economic Cooperation and Development (OECD) countries and that there was significant variation in the rates across the country. The number of women experiencing severe perineal trauma across 301 local areas (Statistical Area 3) ranged from 6 to 71 per 1,000 vaginal births. There was also variation by jurisdiction ranging from 22 per 1,000 vaginal births in Western Australia (WA) to 45 in the Australian Capital Territory (ACT). The reason for the variation across Australia and between local areas is not clear but could be related to socioeconomic status and, potentially, hospital practices and clinician skills. It is possible that the higher rates observed in Australia is due to better diagnosis and reporting of perineal tears given there has been a focus on perineal trauma in many maternity units over the last decade.

As a result of increasing concerns about the rates and the medium and long-term impacts of severe perineal tears, many hospitals have developed their own training programs for midwives and doctors to ensure accurate classification and repair techniques. At a national level, the Quality Improvement Collaborative Project was established in November 2017 and is led by Women's Healthcare Australasia (WHA) and the NSW Clinical Excellence Commission. The aim of this national project is to reduce harm to women from perineal tears.

Along with, and in addition to, this national project, anecdotally many health services and clinicians are undertaking initiatives on a local level to reduce their rates of third and fourth degree perineal tears. These initiatives include updating policies, undertaking training to increase awareness in detecting perineal trauma, up-skilling in perineal tear repair, establishment of postpartum perineal tear clinics and optimising best practice care of these women, both in the short and long term.

With this background, the Commission sought a structured, evidence-based literature review to better understand the current clinical environment for preventing and managing

third- and fourth-degree perineal tears and to identify issues or gaps that may be addressed by clinical experts at a clinical roundtable. This report is the result of this review.

### 3. Research questions

The Commission posed a number of research questions to guide the review. These were:

1. Which guidelines, policies and procedures and health policies/programs or strategy documents are available which are relevant to the prevention and treatment of perineal tears in Australia?
2. What do current guidelines specifically recommend for preventing and managing third- and fourth- degree perineal tears?
3. What evidence is there regarding current clinical practice in Australia for preventing and managing severe perineal tears?
4. What contributes to variations in rates of perineal tears? (including differences in clinical practice, service delivery/models of care, access to services, location, skills)
5. What is the literature on interventions to reduce rates of, and morbidity from, perineal tears and the effectiveness of those interventions? This may include information on patient experience.

### 4. Methods

This literature review addresses two main areas: (1) a review of national and international guidelines; and (2) a review of the published literature. We have included publications that have been published in English in the previous five years (2013-2018) and focussed on relevant guidelines, policies or strategic directions (Australian and international) available from the internet, systematic reviews and meta-analyses available through recognised electronic databases and relevant grey literature (such as government reports or issue papers) that are accessible via the internet.

#### 4.1 Review of Guidelines

Guidelines regarding preventing and managing third- and fourth- degree perineal tears were sought from the following organisations: Royal Australian and New Zealand College of Obstetricians and Gynaecologists (RANZCOG), Royal College of Obstetricians and Gynaecologists (RCOG) in the UK, Women's Healthcare Australasia (WHA), New Zealand Guidelines Group (NZGG), the New Zealand College of Midwives (NZCOM), National Institute of Clinical Excellence (NICE) in the UK, the Society of Obstetricians and Gynaecologists of Canada (SOGC), and the American College of Obstetricians and Gynaecologists (ACOG) (Appendix A). This sample was selected as they represented the key national authorities in relation to obstetrics/maternity care in each of the six countries and were widely used to develop local clinical policies for a range of practices.

The websites of the government departments of health in each state and territory in Australia were also reviewed for relevant guidelines. Where a state-wide policy was not found online, the policies of relevant major maternity hospitals were reviewed (Appendix B). It is recognised that there may be other state/territory and major hospital policies or guidelines that are not available online through a publically accessible site. This is a limitation of this guideline review.

## 4.2 Review of peer reviewed literature

Due to the large amount of evidence in this area, it was decided to focus on systematic reviews for the questions related to interventions (a review of reviews). Where systematic review level evidence was lacking, we also undertook a search of more recent randomised controlled trials or other evidence sources that were directly relevant to the questions such as cohort studies, case-controlled studies, qualitative studies or background papers that are relevant.

We undertook a summary of the main features of each publication (with a focus on systematic reviews), including the research purpose, study design, population, intervention and comparator, outcomes and the quality of the evidence (Appendix C).

Women's experiences were explored through a search of qualitative or survey designs, similarly with a focus on synthesised reviews, also known as 'meta-syntheses' (the methodology for a synthesis of qualitative data).

### 4.2.1 Search strategy and synthesis

Relevant reviews concerning perineal tear prevention and management were identified through a key database search including: Cochrane Database of Systematic Reviews, EMBASE, MEDLINE, Maternity and Infant Care Database and Google Scholar. In order to ensure that relevant studies were not missed, key search terms were used are provided in Box 2.

#### Box 2: Search terms used in the literature review

'perineum' OR 'perineal tears' OR 'perineal laceration' OR 'perineal rupture' OR 'perineal trauma' OR 'perineal fourth degree tear' OR 'perineal third degree tear' OR 'severe perineal tear' OR 'episiotomy' OR 'anal canal injuries' OR 'obstetric anal sphincter injuries (OASI)' OR 'obstetric perineal tear'

AND

'injuries' OR 'assessment' OR 'obstetrics education' OR 'midwifery education' OR 'gynaecology education' OR 'obstetric skill' OR 'midwifery skill', OR 'obstetric labour complications' OR 'risk factors' OR 'prevention' OR 'diagnosis' OR 'assessment' OR 'treatment' OR 'management' OR 'repair' OR 'surgery' OR 'best practice' OR 'clinical practice' OR 'classification'

A total of 10,383 papers were identified. Selection of articles focussed on systematic reviews of 'severe' perineal tears – third and fourth degree perineal tears. Studies were ineligible for consideration in this review if they were published prior to 2013, involved non-human participants or were published in languages other than English. Results were narrowed to 2983 articles. Conference papers, abstracts, opinion pieces and duplicates were excluded. Titles and abstracts of papers were reviewed and excluded if they did not address the main overarching research question. The reference lists of key papers were hand-searched to identify additional relevant articles. Twenty-six systematic review papers were identified and examined in detail.

A table was developed to summarise the selected systematic reviews. This included details on the year and authors of the review, the objective, number of studies included, the

population, intervention, comparator and outcomes relevant to perineal tears. From this table a summary and synthesis of the findings was developed using the time periods – antenatal, intrapartum and postpartum.

## 5 Findings

### 5.1 Guidelines

#### 5.1.1 National and international guidelines

Eight (8) relevant guidelines from professional colleges, membership associations or guideline agencies were found. We found no specific guideline from the New Zealand Guidelines Group (NZGG) or the New Zealand College of Midwives (NZCOM).

**Table 1: National and international guidelines relevant to prevention and management of severe perineal trauma**

<b>Author and country</b>	<b>Year updated</b>	<b>Guideline title</b>
<b>Royal Australian and New Zealand College of Obstetricians and Gynaecologists (Australia and New Zealand)</b>	N/A – link to RCOG	<i>Management of Third- and Fourth-Degree Perineal Tears</i>
<b>Australian College of Midwives (Australia)</b>	2017	<i>Midwifery Guidelines for Consultation and Referral</i>
<b>National Institute for Health and Care Excellence (United Kingdom)</b>	2017	<i>Intrapartum care for healthy women and babies. Clinical guideline</i>
<b>Royal College of Obstetricians and Gynaecologists (United Kingdom)</b>	2015	<i>Management of Third- and Fourth-Degree Perineal Tears</i>
<b>American College of Obstetricians and Gynaecologists (USA)</b>	2018	<i>ACOG Practice Bulletin No. 198: Prevention and Management of Obstetric Lacerations at Vaginal Delivery</i>
<b>Society of Obstetricians and Gynecologists of Canada (Canada)</b>	2018	<i>No. 148-Guidelines for Operative Vaginal Birth</i>
<b>Society of Obstetricians and Gynecologists of Canada (Canada)</b>	2015	<i>Obstetrical Anal Sphincter Injuries (OASI): Prevention, Recognition, and Repair</i>
<b>Women’s Healthcare Australasia (Australia and New Zealand)</b>	2018	<i>WHA National Collaborative: Reducing harm from third and fourth degree perineal tears</i>

The principal guidelines from which many of the other guidelines and policies are drawn from are the *Intrapartum care for healthy women and babies - clinical guideline* from the National Institute for Health and Care Excellence<sup>7</sup> and the *Management of Third- and Fourth-Degree Perineal Tears* from the RCOG,<sup>4</sup> both from the United Kingdom.

In terms of professional colleges in Australia, the Royal Australian and New Zealand College of Obstetricians and Gynaecologists (RANZCOG) directly links to the RCOG guideline. The Australian College of Midwives does not have a specific guideline although they refer to severe perineal trauma in the Midwifery Guidelines for Consultation and Referral stating that this a Category C condition – requiring consultation and referral to a medical practitioner for Secondary or Tertiary care.<sup>8</sup>

In 2018, Women’s Healthcare Australasia (WHA), a membership organisation, who represents more than 100 hospitals providing maternity services across the country, commenced a WHA National Collaborative implementing a bundle of care to reduce the incidence of severe perineal trauma across their member hospitals.

The details of the main points from each guideline or bundle of care are described in Appendix A.

### 5.1.2 State-wide guidelines or policies

There were two state-wide guidelines/policies found as well as three from major hospitals in the country, one of whom is usually considered to represent state-wide policies (King Edward Memorial Hospital in Western Australia). All of these seem to be either explicitly or implicitly based on the RCOG guideline.<sup>4</sup>

There were no major guidelines or policies found online from Tasmania, Northern Territory or the Australian Capital Territory.

**Table 2: State and major hospital guidelines or policies relevant to prevention and management of severe perineal trauma**

State or territory/hospital	Year updated	Guideline or policy title
<b>South Australia – SA Maternal Neonatal &amp; Gynaecology Community of Practice</b>	2018	South Australian Perinatal Practice Guideline: Third and fourth degree tear management
<b>Queensland - Queensland Health Clinical Guidelines</b>	2018	Perineal Care
<b>Western Australian – Women's and Newborn Health Service, King Edward Memorial Hospital. (Note: KEMH policies are usually considered to be the state-wide policies)</b>	2014	Management of 3rd & 4th Degree Perineal Trauma: Clinical Guidelines - Obstetrics & Midwifery
<b>Victoria - The Royal Women's Hospital</b>	2017	Guideline: Third and Fourth Degree Tears – Management
<b>NSW – Royal Hospital for Women</b>	2017	Third and fourth degree perineal tears - repair and management

### 5.1.3 Similarities and differences between guidelines

Much of the content of the guidelines are similar due to many being based on the UK’s RCOG guideline.<sup>4</sup> The main similarities include the:

- Classification systems
- Recommendation of selective or restricted episiotomy rather than routine especially for women having a spontaneous vaginal birth
- Application of perineal warm compresses
- Importance of a slow birth (although the specific way to facilitate this varies across guidelines)
- If an episiotomy is indicated, ensuring it is mediolateral
- The procedure and location of the repair
- Administration of single dose antibiotics at the time of repair
- Post-operative care especially follow-up.

There are a number of differences between the guidelines, even when based on similar evidence. These include the:

- Process by which the accoucher (the person delivering the baby) guards the women's perineum to slow the birth of the baby's head. For example, RCOG states that 'perineal protection at crowning can be protective' whereas WHA provides very specific instructions – 'support the perineum with the dominant hand and apply counter-pressure on the foetal head with the non-dominant hand'.
- Need for an episiotomy for an instrumental birth. For example, WHA provides very specific advice – an episiotomy is indicated for all women having their first vaginal birth requiring a forceps or ventouse assisted delivery – whereas most other guidelines are less directive – RCOG states that - mediolateral episiotomy should be considered in instrumental deliveries.
- Offering of intrapartum perineal massage. For example, the Queensland guideline specifically offers this whereas the NICE guideline for normal labour and birth specifically recommends against it.
- Rectal examination following birth. For example, WHA recommends this for all women whereas most of the others recommend this for women who experience some degree of perineal trauma, even superficial.
- The timing of the repair. For example, SOCG states that 'repair can be delayed for 8 to 12 hours with no detrimental effect. Delay may be required so a more experienced care provider is available for the repair' whereas the Western Australia guideline states that 'suture as soon as possible after birth - it is less painful and reduces the risk of infection. Following a water birth, it is advisable to delay suturing for 1 hour following the birth.' There does not seem to be any specific high level evidence to support the exact timing of the repair.

## 5.2 Review of reviews

### 5.2.1 Perineal Tear Prevention – Antenatal considerations

#### 5.2.1.1 Risk factors for severe (third- and fourth-degree perineal tears)

Various risk factors are known to be associated with an increased risk of perineal tears and may be identified and discussed with women in the antenatal period.<sup>9</sup> Risk factors which have a clear association with third- and fourth-degree tears include:

- Infants with a higher birth weight (mean difference 192.88g, 95% CI 139.80-245.96,  $p < 0.001$ , 5 studies, 210 959 women)
- Episiotomy (odds ratio 3.69, 95% CI 1.45-9.38,  $p < 0.001$ , 15 studies, 590 642 women)
- Operative vaginal births (odds ratio 5.10, 95% CI, 3.33–7.83,  $p < 0.001$ , 18 studies, 590 883 women).<sup>9</sup> Overall, it appears that selective use of episiotomy does reduce the risk of third and fourth degree tears in unassisted vaginal births.

A review by Pergialiotis and colleagues found that the association between instrumental vaginal birth and severe perineal tears appears to be irrespective of whether women had a vacuum extraction or forceps delivery. However, an earlier review focused on instrumental deliveries by O'Mahony found an increased risk of severe perineal tear with forceps<sup>10</sup> (see 5.2.2.2.6).

Other risk factors which appear to also have an association with severe perineal tears include:<sup>9</sup>

- Primiparity (odds ratio 3.24, 95% CI 2.20-4.76,  $p < 0.001$ , 12 studies, 515 161 women)
- Asian ethnicity (odds ratio 2.74, 95% CI 1.31-5.72,  $p < 0.001$ , 4 studies, 111 687 women)
- Epidural anaesthesia (odds ratio 1.95, 95% CI 1.63–2.32,  $p < 0.001$ , 11 studies, 66 044 women)
- Labour induction (odds ratio 1.08, 95% CI 1.02–1.14,  $p = 0.01$ , 9 studies, 468 204 women)
- Labour augmentation (odds ratio 1.95, 95% CI 1.56-2.44,  $p < 0.0001$ , 8 studies, 43 006 women)
- Persistent occiput posterior presentation (OR 3.09, 95% CI 1.81–5.29,  $p < 0.001$ , 7 studies, 353 965 women)

#### *5.2.1.2 Recurrent obstetric anal sphincter injury (OASI) after the index birth*

In multiparous women who have had a previous OASI, there is no clear difference in the overall rate of recurrent OASI and associated risk factors compared to the overall rate and associated risk factors for primary OASI.<sup>11</sup> However, instrumental birth (forceps (pooled OR 3.12, 95 % CI 2.42–4.01, five studies), vacuum extraction (pooled OR 2.44, 95 % CI 1.83–3.25, five studies)), birthweight over 4 kg (pooled OR 2.29, 95 % CI 2.06–2.54, 4 studies) and previous fourth-degree perineal tear (OR 1.7, 95 % CI 1.24–2.36, three studies) all appear to be associated with an increased risk of recurrent OASI. A slightly increased risk is also seen with maternal age over 35 years (odds ratio 1.16, 95 % CI 1–1.35, 3 studies).<sup>11</sup>

#### *5.2.1.3 Preventative strategies - Perineal massage*

One systematic review has shown that antenatal perineal massage from approximately 35 weeks' gestation reduces the incidence of perineal trauma requiring suturing (mainly episiotomies).<sup>12</sup>

Women who performed perineal massage during pregnancy were 16 per cent less likely to have an episiotomy than women who did not perform perineal massage (risk ratio 0.84; 95% CI 0.74 to 0.95, four trials, 2480 women).<sup>12</sup> This result was statistically significant in nulliparous women (risk ratio 0.83; 95% CI 0.73 to 0.95, four trials, 1988 women). For



women who have given birth vaginally before, the benefit of perineal massage was less clear.

Among women who performed perineal massage, a subgroup analysis found a 16% reduction in the incidence of perineal trauma, among women who performed perineal massage 1.5 times a week during pregnancy (two trials, 1500 women, risk ratio 0.84; 95% CI 0.74 to 0.96), and an 8% reduction in those who massaged 1.5 to 3.4 times a week (two trials, 1650 women, risk ratio 0.92; 95% CI 0.85 to 1.00). No statistically significant reduction was found in women who massaged more than 3.5 times a week during pregnancy (two trials, 1598 women, average risk ratio 0.94; 95% CI 0.86 to 1.02).

However, no clear difference was seen in the incidence of first, second or third and fourth degree tears in women who performed antenatal perineal massage compared to those who did not.

Women who have had a previous vaginal birth and practised perineal massage during pregnancy were less likely to report perineal pain at three months postpartum (regardless of whether or not an episiotomy was performed) (risk ratio 0.45; 95% CI 0.24 to 0.87, one trial, 376 women).<sup>12</sup>

In women who performed antenatal perineal massage compared to those who did not; there was no clear difference in the length of second stage of labour, proportion of instrumental births, women's satisfaction with perineal massage, perineal pain in the days immediately following birth, sexual satisfaction, dyspareunia or incontinence of faeces, urine or flatus.<sup>12</sup>

Women's views about practising massage were not recorded in any of the included studies. There is one study that provides data from a survey on women's views on perineal massage. This study found that while most women found the practice of perineal massage acceptable and believed it assisted them to prepare for birth, they reported that it was often uncomfortable, unpleasant and even produced a painful or burning sensation initially. These experiences were decreased or absent by the second or third week of massage. The survey also reported that most women (79%) would massage again in a subsequent pregnancy and almost all (87%) would recommend it to other women.<sup>13</sup> A recent narrative review has reported benefits for women who practise antenatal perineal massage; including feeling in control, feeling positive about their own preparation and having a sense of pride.<sup>14</sup>

Van Kampen and colleagues conducted a systematic review of the efficacy of physiotherapy for the prevention and treatment of prenatal symptoms with a focus on the impact of antenatal perineal massage.<sup>15</sup> The review included the same papers as the review performed by Beckmann and Stock<sup>12</sup> and came to the same conclusions.

#### *5.2.1.4 Preventative strategies – use of devices*

The Epi-No birth trainer is a device that is inserted by the woman into her vagina during the latter part of pregnancy to theoretically stretch the perineum and therefore, reduce tearing at the time of vaginal birth. However, in the systematic review the Epi-No device did not



result in a clear difference in reducing episiotomy rates nor on reducing severe perineal tears.<sup>16</sup> A meta-analysis found that Epi-No did not reduce episiotomy rates (risk ratio 0.92, 95% CI 0.75-1.13,  $p=0.44$ , two studies, 710 women) or reduce the incidence of severe perineal tears (risk ratio 1.31, 95% CI 0.72-2.37,  $p=0.38$ , two studies, 705 women).<sup>16</sup> Women's views and acceptability were not reported.

#### *5.2.1.5 Preventative strategies - Pelvic Floor Muscle Training*

Antenatal pelvic floor muscle training does not appear to have an effect on the rates of episiotomy (odds ratio 0.75, 95% CI 0.54-1.02, seven studies) or on rates of perineal laceration (odds ratio 0.96, 95% CI 0.66 to 1.40, six studies).<sup>17</sup>

## 5.2.2 Practices during labour and birth

### *5.2.2.1 Maternal position at birth*

Maternal positions at the time of birth appear to affect the degree and incidence of perineal trauma.<sup>18</sup> Kneeling and all-fours positions appear to be more closely associated with an intact perineum compared to sitting, squatting and using a birth-stool.<sup>18</sup> This may be due to the hands-and-knees position generally meaning a slower birth of the baby's head due to less vigorous pushing. The association with different degrees of perineal tear was not reviewed. Among primiparous women, sitting, squatting and using a birth stool were associated with rates of perineal trauma of up to 85.7%.<sup>18</sup> However, the review did not comment on the association with severe perineal tears (third- and fourth-degree). Women's views and experiences were not specifically addressed in this review.

Water birth appears to be associated with an increased risk of perineal trauma in nulliparous women but may be protective for multiparous women. The association with episiotomy was not reviewed.

### *5.2.2.2 Pushing practices during the second stage of labour*

During the second stage of labour, spontaneous (supporting the woman to push as she feels which are usually short, frequent pushes) versus directed (instructing the woman to push – usually 2-3 strong and long pushes with a closed glottis per contraction) pushing does not result in a clear difference in rates of third or fourth degree tears (risk ratio 0.87; 95% CI 0.45 to 1.66, one study of 320 women)<sup>19</sup> or episiotomy (average risk ratio 1.05; 95% CI 0.60 to 1.85, two studies, 420 women, random effects,  $I^2=81\%$ ).<sup>19</sup> Similarly, immediate versus delayed pushing in women with an epidural does not result in a clear difference in third or fourth degree tears (risk ratio 0.94%; 95% CI 0.78 to 1.14, seven studies, 2775 women) or episiotomy (risk ratio 0.95, 95% CI 0.87 to 1.04, five trials of 2320 women).<sup>19</sup>

Only one study in this review examined women's satisfaction using a visual analogue scale and showed no differences in the different approaches in pushing. None of the studies examined the women's perception of pain in the second stage. Most of the studies failed to report on women's preferences and views of interventions.

### *5.2.2.3 'Hands-on' versus 'hands-off/poised' practice during crowning of the baby's head*

We found four systematic reviews which compared 'hands-on' versus 'hands-off' perineal management techniques on rates of perineal tears. Overall it appears that 'hands-on'

techniques are associated with a higher incidence of episiotomy<sup>20-23</sup> and higher rates of postpartum pain<sup>22 23</sup> and postpartum haemorrhage<sup>22</sup>. Although there is some evidence that 'hands off' techniques result in less perineal trauma, data should be considered cautiously given considerable heterogeneity between studies. There is very little evidence about acceptability of hands-on versus hands-off techniques to women.

The four review findings are each described below:

- Aasheim and colleagues found that hands-on or hands-off the perineum does not result in a clear difference in the incidence of third or fourth degree tears (average RR 0.68, 95% CI 0.21 to 2.26, five studies, Tau<sup>2</sup> 0.92, I<sup>2</sup> 72%, 7317 women).<sup>20</sup> However, hands-on techniques appear to be associated with a higher incidence of episiotomy (average RR 0.58, 95% CI 0.43 to 0.79, Tau<sup>2</sup> 0.07, I<sup>2</sup> 74%, four studies, 7247 women).<sup>20</sup>
- Bulchandani and colleagues examined hands-off versus hands-on techniques and perineal trauma and similarly found that the hands-off technique reduces the incidence of episiotomy.<sup>21</sup> In regards to postpartum pain associated with hands-on versus hands-off techniques, the studies reviewed reported inconsistent findings. This review conducted a meta-analysis to investigate the risk of OASI with hands-on versus hands-off techniques. An analysis of three non-randomised studies and found a significant protective effect of hands-on techniques in reducing the risk of OASI (risk ratio 0.45, 95% CI 0.40-0.50, I<sup>2</sup>=32%, 74,744 women).
- Petrocnik and colleagues performed a systematic review but not a meta-analysis and also found the hands-off technique was associated with a decreased incidence of perineal trauma including episiotomy.<sup>22</sup> Hands-on technique was found to be associated with higher rates of postpartum haemorrhage and increased perineal pain postpartum.<sup>22</sup>
- Wang and colleagues<sup>23</sup> conducted a structured systematic review of nine papers and also found that hands-off was associated with a decreased incidence of episiotomy and hands-on was associated with a decreased incidence of OASI and less perineal pain. However, the authors commented on the lack of consistent descriptions and details to define hands-on techniques in the studies reviewed and literature more broadly, stating that conclusions cannot be drawn regarding whether hands-on or hand-off leads to less perineal trauma given the lack of information regarding what exactly the accoucher's hands are doing with regards to hands-on techniques.<sup>23</sup>

#### *5.2.2.4 Perineal management techniques*

**Warm compresses** are small towels placed in warm water, wrung out and then applied by the accoucher against the woman's perineum when the baby's head is crowing.

Warm compresses do not have any clear effect on the incidence of the rate of women having an intact perineum (average RR 1.02, 95% CI 0.85 to 1.21; 1799 women; four studies)<sup>20</sup> or episiotomy (average RR 0.86, 95% CI 0.60 to 1.23; 1799 women; four studies).<sup>20</sup>

Warm compresses do appear to reduce the incidence of third and fourth degree perineal tears (average RR 0.46, 95% CI 0.27 to 0.79; 1799 women; four studies; moderate-quality

evidence).<sup>20</sup> The systematic review did not report on women's satisfaction although one early Australian trial showed that women found the warm compresses to be highly acceptable, would recommend them to other women<sup>24</sup> and also reported less pain during the birth and on days 1 and 2<sup>24</sup>.

**Intrapartum perineal massage** is applied by the finger of the accoucher around the edge of the introitus area just before the baby's head is crowning in an effort to assist the perineum to stretch. This practice appears to reduce the incidence of third- or fourth-degree tears (average RR 0.49, 95% CI 0.25 to 0.94, five studies, 2477 women)<sup>20</sup> and increase the incidence of intact perineum (average RR 1.74, 95% CI 1.11 to 2.73, six studies, 2618 women; I<sup>2</sup> 83%).<sup>20</sup> Intrapartum perineal massage may also reduce the incidence of episiotomy, although heterogeneity of studies means that results should be interpreted with caution (average RR 0.55, 95% CI 0.29 to 1.03, seven studies, Tau<sup>2</sup> 0.43, I<sup>2</sup> 92%, 2684 women). We could not find evidence on whether this practice was acceptable to women.

**Ritgen's manoeuvre**, which involves applying pressure on the perineum with one hand and applying pressure to the baby's head with the other hand to slow the speed of the birth of the baby's head, was not found to have an effect on the incidence of an intact perineum (RR 0.17, 95% CI 0.02 to 1.31) or incidence of third- or fourth-degree tears (RR 1.24, 95% CI 0.78 to 1.96, 1423 women).<sup>20</sup>

#### *5.2.2.5 Manual rotation of the baby's head*

A manual rotation of the baby's head using the accoucher's hand may be undertaken to rotate a baby's head from the occipito-posterior to occipito-anterior to reduce the diameter of the head and hopefully enable vaginal birth to occur without the use of instruments.

A systematic review including one small pilot study of 30 women found no difference in the incidence of third or fourth degree perineal trauma between manual rotation and no manual rotation groups (risk ratio 0.20, 95% CI 0.01 to 3.85).<sup>25</sup> Acceptability to women was not reported in this review.

#### *5.2.2.6 Instrumental vaginal birth*

A systematic review on choice of instruments if an assisted vaginal birth is required included 13 studies.<sup>10</sup> Of those included, 10 reported on third- and fourth-degree tears. Severe perineal trauma was more likely to occur in the forceps group irrespective of whether an episiotomy was undertaken (RR 1.89, 95% CI 1.51 to 2.37). Only one study involving 130 women reported on flatus incontinence/altered continence as a result of the birth. This outcome was more likely with forceps (RR 1.77, 95% CI 1.19 to 2.62).

#### *5.2.2.7 Episiotomy*

The current evidence does not support the use of routine episiotomy to third and fourth degree perineal tears.<sup>26</sup>

Use of selective episiotomy can result in a 30% reduction in the incidence of third and fourth degree perineal tears in women where an unassisted vaginal birth was anticipated (RR 0.70, 95% CI 0.52 to 0.94; 5375 women; eight RCTs).<sup>26</sup>

In vacuum-assisted births, use of mediolateral or lateral episiotomy in primiparous women may reduce the risk of OASI (odds ratio 0.53, 95% CI 0.37-0.77, 321,459 women, 15 studies).<sup>27</sup> The findings from this meta-analysis found that one case of OASI was prevented for every 19 episiotomies performed (number needed to treat (NNT) was 18.3, 95% CI 17.7-18.9).<sup>27</sup>

Vergheze and colleagues conducted a similar systematic review but focussed on rates of OASI between women who had had a mediolateral episiotomy versus those who had not. The review included 16 studies of 651, 114 women and also found that mediolateral episiotomy reduce the risk of OASI in vaginal births (risk ratio 0.67, 95% CI 0.49-0.92).<sup>28</sup>

### 5.2.3 Care during the immediate postpartum period

The long-term impact of severe perineal trauma includes complications such as anal incontinence. Therefore, it is important to consider the risk factors for this outcome to see if they can be minimised. Women who have an episiotomy or third- or fourth-degree tear are more likely to experience anal incontinence.<sup>29</sup> Women who have had an episiotomy are 1.74 times more likely to have anal incontinence (95% CI 1.28-2.38,  $p < 0.26$ ,  $I^2 = 21.4$ , eight studies, 2929 women). Women who experience a third- or fourth-degree perineal tear are 2.66 times more likely to have anal incontinence (95% CI 1.77-3.98,  $p < 0.002$ ,  $I^2 = 64.1$ , 12 studies, 2288 women).

There is insufficient evidence to determine whether particular birth modes (caesarean versus vaginal) worsen anal incontinence in women who have experienced a previous OASI.<sup>30</sup>

#### 5.2.3.1 Clinician assessment of perineal tears

Accurate and timely diagnosis of the degree of perineal trauma is critical to ensure that appropriate management can occur. The RCOG guideline provides a classification system to be used when describing any obstetric anal sphincter injury.<sup>4</sup>

There were no reviews found that specifically addressed the issue of routine per-rectal (PR) examination for all women, regardless of whether they had a perineal tear.

A integrative systematic review into health professionals (doctors and midwives) knowledge and skills in assessment of perineal tears after childbirth found that both doctors and midwives have poor knowledge in perineal anatomy and lack education and training in clinical assessment and classification of perineal tears.<sup>3</sup> A Spanish study, examining perineal anatomy knowledge of trainee doctors and midwives, found that of the 69% of doctors and 25% of midwives who stated they knew which muscles were torn; over 50% named the muscles incorrectly.<sup>31</sup>

A UK study investigated whether a one-day hands-on workshop in perineal repair for midwives and doctors changed clinical practice.<sup>32</sup> The course evaluation found an improvement in clinical knowledge and skills with 45 to 80% of participants correctly classifying perineal tears increasing to 67 to 89% after the course. The six studies included in the systematic review explored midwives' and doctors' own perceptions of education and training in perineal tear anatomy and classification. All six studies found that the majority of midwives and doctors considered their knowledge and training to be poor.<sup>3</sup> The findings of the review suggest that incorrect assessments in classification of perineal tears are common and hence women experiencing perineal tears may be inadequately managed.<sup>3</sup>

#### *5.2.3.2 Use of endoanal ultrasound to assess anal sphincter injuries*

A systematic review of one trial of 752 women found some evidence to suggest that endoanal ultrasound performed prior to perineal repair may reduce the risk of severe anal incontinence at 12 months postpartum (RR 0.48, 95% CI 0.24 to 0.97, one study, 684 women).<sup>33</sup> The authors hypothesise that the use of endoanal ultrasound may increase the diagnosis of OASI and therefore lead to increased rates of primary repair and reduce the incidence of anal incontinence. However, increased incidence of perineal pain at three months postpartum was observed in women in the ultrasound group (risk ratio 5.86, 95% CI 1.74 to 19.72, one study, 684 women).

#### *5.2.3.2 Obstetric anal sphincter injury repair techniques*

A systematic review of six studies found that immediate primary overlap repair compared to end-to-end repair of obstetric anal sphincter injuries appears to be associated with a reduced risk of faecal urgency and anal incontinence symptoms at 12 months. However, at 36 months there appears to be no difference in symptoms between the two techniques. The meta-analysis only included two small trials and hence results should be interpreted with caution.<sup>34</sup>

Longer term follow-up (OASI clinics for example) and physiotherapy were beyond the scope of this review and therefore are not included.

#### *5.2.3.3 Administration of antibiotics*

There is insufficient evidence to determine whether routine administration of antibiotics before or immediately after incision or repair of episiotomy in women with an uncomplicated vaginal birth results in decreased episiotomy wound dehiscence (breakdown) or infection.<sup>35</sup> A Cochrane review of available evidence only identified one quasi-RCT from a public hospital in Brazil using data from the births of 73 women. Quality of evidence was poor with limitations related to lack of random sequence generation, allocation concealment and blinding.

One systematic review found that prophylactic antibiotics for third and fourth degree tears may reduce the incidence of wound infections at two-weeks postpartum.<sup>36</sup> In the intervention group, the incidence of perineal wound infection was 8.2% versus 24.1% in the control group (risk ratio 0.34, 95% CI 0.12-0.96).<sup>36</sup> However, this review was based on one small trial with very high loss to follow-up so results should be interpreted cautiously.

#### *5.2.3.4 Secondary suturing of dehisced perineal wounds*

There is insufficient evidence to determine whether secondary suturing of dehisced perineal wounds improves wound healing and dyspareunia. One systematic review<sup>37</sup> found two studies which reported on secondary suturing of dehisced/infected perineal wounds. One included study found a trend towards improved wound healing in the re-sutured group, but it was not statistically significant (risk ratio 1.69, 95% CI 0.73-3.88, one study, 17 women). One other study, found no statistically significant difference in rates of dyspareunia (painful sexual intercourse) at two (risk ratio 0.44, 95% CI 0.18 to 1.11, one study, 26 women) or six months (risk ratio 0.39, 95% CI 0.04 to 3.87, one study 32 women) post perineal injury.

#### *5.2.3.5 Pain relief post repair*

Compared to placebo, women with perineal pain in the early postpartum period are more likely to achieve adequate pain relief and less likely to need additional analgesia with non-steroidal anti-inflammatories (NSAIDs) at four and six hours postpartum.<sup>38</sup> Compared to paracetamol, NSAIDs are also more effective for adequate pain relief at 6 hours postpartum but no difference was seen at four hours postpartum nor was there a difference in the need for additional analgesia.<sup>38</sup> The results of the systematic review lack generalisability as women who were breastfeeding were excluded from the studies analysed.

#### *5.2.3.5 Women's experiences postpartum*

There is very limited evidence on women's experiences and views in relation to the prevention and management of severe perineal trauma especially during pregnancy, labour and birth and also in the postpartum period and longer term. One study however is a meta-ethnographic synthesis of studies on women's experiences of sustaining a third or fourth degree tear during childbirth.<sup>5</sup> This included four qualitative studies and showed some women had significant social and emotional challenges as a result of the severe perineal trauma including social isolation and marginalisation due to the symptoms they suffered. The experience of severe perineal trauma had long-lasting impacts on women's sense of identity.

A follow-up study was conducted in Australia with women who had experienced severe perineal trauma during vaginal birth.<sup>5</sup> This small qualitative study highlighted the immediate aftermath of severe perineal trauma showing that there was a disconnect between the expectations and reality of the birth experience and immediate postpartum period for women, and this had impacts upon their ability to mother their newborn child and the sexual relationship they have with their partner.

## Discussion

This review has primarily examined systematic reviews in addition to international, national and state/territory policies and guidelines in order to address the five review questions.

1. *Which guidelines, policies and procedures and health policies/programs or strategy documents are available which are relevant to the prevention and treatment of perineal tears in Australia?*
2. *What do current guidelines specifically recommend for preventing and managing third- and fourth- degree perineal tears?*
3. *What evidence is there regarding current clinical practice in Australia for preventing and managing severe perineal tears?*
4. *What contributes to variations in rates of perineal tears? (including differences in clinical practice, service delivery/models of care, access to services, location, skills)*
5. *What is the literature on interventions to reduce rates of, and morbidity from, perineal tears and the effectiveness of those interventions? This may include information on patient experience.*

Eight guidelines from professional colleges, membership associations or guideline agencies were found as well as five state/territory or major hospital policies. Most of the jurisdictional and health service policies were based on the RCOG Greentop Guideline (2015). There were a number of similarities between the guidelines including the restrictive use of episiotomy, the use of warm compresses, the importance of slowing the birth of the baby's head down and the administration of antibiotics at the time of repair. The main differences were the process to slow down the birth of the baby's head, the use of perineal massage, the need for an episiotomy for an instrumental birth, the per rectal examination following the birth and the timing of the repair. A review of 26 systematic reviews was undertaken to address issues relating to risk factors, preventative strategies, and clinical practices especially during the birth and short-term postpartum considerations.

### 6.1 Synthesis of findings in relation to prevention and management of perineal tears

A synthesis of the findings in relation to the prevention and care of women after a severe perineal tears highlighted the following issues according to the quality of the evidence:

#### *Moderate quality evidence:*

- Antenatal perineal massage from 35 weeks is associated with a decreased incidence of episiotomy (statistically significant in nulliparous women), decreased incidence of perineal trauma requiring suturing (statistically significant in nulliparous women) and a decreased incidence of ongoing perineal pain at three months postpartum (in women who have had a vaginal birth previously).<sup>12</sup>
- Compared to land birth, water birth may be associated with an increased incidence of perineal trauma in primiparous women but may be protective for multiparous women.<sup>18</sup>
- Kneeling and all-fours maternal birth positions may be associated with an increased incidence of intact perineum.<sup>18</sup>
- Both episiotomy (selective and routine) and third- or fourth-degree perineal laceration are significantly associated with anal incontinence.<sup>29</sup>

#### *Low to moderate quality evidence:*

- Primiparity and being of Asian ethnicity are non-modifiable risk factors associated with an increased risk of severe perineal tear.<sup>9</sup> Modifiable risk factors associated



with an increased risk include epidural anaesthesia, labour induction, labour augmentation and persistent occiput posterior presentation (which may be altered during second stage using manual rotation).<sup>9</sup>

- Other potentially modifiable risk factors associated with an increased likelihood of severe perineal tears include an episiotomy and operative vaginal deliveries (both vacuum and forceps).<sup>9</sup> An infant with a higher birth weight is also a risk factor but more difficult to potentially modify.
- Use of selective (rather than routine) episiotomy can reduce the incidence of severe perineal trauma (in women where an unassisted vaginal birth is anticipated).<sup>26</sup>
- Intrapartum perineal massage is more likely to result in an intact perineum and reduce the incidence of third- and fourth-degree tears.<sup>20</sup>
- ‘Hands off’ technique during the second stage of labour may reduce the incidence of episiotomy.<sup>9 20 21 23</sup>

*Very low to low quality evidence:*

- Doctors and midwives do not always have adequate knowledge in perineal anatomy and lack standardised education and training to accurately classify perineal tears. This may result in misdiagnosis and mismanagement of perineal tears leading to increased side effects and poor quality of life for women (although this research was not conducted in Australia).<sup>3</sup>

Some of the evidence is somewhat contradictory, for example, ‘intrapartum perineal massage is more likely to result in an intact perineum and reduce the incidence of third- and fourth-degree tears’ and ‘hands off technique during the second stage of labour may reduce the incidence of episiotomy’. It seems likely that an accoucher would choose one practice over the other but because there are no direct comparisons – massage versus hands off – it is difficult to know which practice is more effective.

## 6.2 Gaps identified in the literature

This literature review identified several gaps in the evidence base which need to be met to facilitate development of strong evidence-based recommendations. In particular, there is a need for adequately powered and efficiently designed randomised control trials to assess:

- Different maternal upright birth positions and use of pelvic floor muscle training and how they affect labour and birth outcomes. Ideally these studies need to clearly eliminate other influences on labour outcomes in analysis of data.<sup>17</sup>
- Types of pushing, with or without epidural, on serious perineal lacerations and episiotomy.<sup>19</sup>
- Further evaluate the role of perineal techniques such as, warm compresses and massage, in reducing the incidence of perineal tears.<sup>20</sup>
- Test ways of effectively slowing down the birth of the baby including supporting women to be in a hand-and-knees position and breathe, rather than actively push, the baby out.
- Manual perineal support (hands-on) in reducing incidence of obstetric anal sphincter injuries.<sup>21</sup>



- The benefits or risks of per-rectal examination on all women as opposed to women with evidence of perineal trauma.
- Comparative benefits and harms of prophylactic antibiotics on infection morbidity after episiotomy, using common antibiotics and regimens in current obstetric practice.<sup>35</sup>
- Effectiveness of secondary suturing for broken down perineal wounds compared with no suturing.<sup>37</sup>
- Repair techniques and timing of repair for OASI. Ideally these studies should follow up women at six weeks, three, six and 12 months and assess outcomes including faecal urgency, anal incontinence and quality of life issues.<sup>34</sup>

Other areas where more research is needed include:

- Knowledge and skills in assessment and classification of perineal tears.<sup>3</sup>
- Standardisation and therefore use of 'hands on' perineal management technique in order to describe exactly what 'hands on' technique refers to i.e. where to place hands and fingers, if pressure or squeezing is applied and in which direction.<sup>23</sup>
- Women's view and experiences of the different prevention strategies and clinical practices including discomfort, restrictions on movement and sense of being in control with respect for personal choices.

### 6.3 Limitations

Due to the large amount of literature in this area we undertook a review of reviews to address a number of the research questions. It is recognised that this will mean observational, descriptive and other non-RCT designs will have been excluded. However, the main risk factors, clinical practices and preventative strategies that are anecdotally known in practice seem to have been included.

The review of national and international guidelines and local policies was limited by access to the materials online. It is likely that many hospitals in Australia (if not all) have a policy on reducing severe perineal trauma and managing the repair and recovery process, however these will often be behind institutional firewalls and therefore we were unable to access. The policies we did find were highly influenced by the RCOG Greentop Guidelines which suggests that others might be as well.

## 7 Implications and recommendations:

### 7.1 Specific issues of relevance to Australia

This review has shown reasonable consistency in the practices designed to reduce the incidence of perineal trauma and the care of women after severe perineal trauma. The studies reviewed seem mostly highly relevant to the Australian context and so can be used to guide practice. The UK, RCOG Greentop Guidelines on the management of third and fourth degree tears appear to have been widely applied across Australia.

There were a number of issues potentially relevant to an Australian population that require consideration. Being of Asian ethnicity is a recognised risk factor and increasingly the Australian population has a greater proportion of people from an Asian background due to

migration. Of all women who gave birth in Australia in 2016, 18% were born in an Asian country<sup>39</sup> compared with 13% in 2010<sup>40</sup> and 8.6% in 2006.<sup>41</sup>

There may also be specific practices in Australia that are different to other countries or changing over time that require consideration. The proportion of vaginal births has slightly reduced in the last decade potentially altering the skill-base of providers in relation to supporting perineal integrity. In 2016, two thirds of women (66%) had a vaginal birth compared with 69% in 2006<sup>41</sup>. The mix between forceps and vacuum extraction has also changed with forceps deliveries becoming more common. In 2006, forceps deliveries occurred for 3.5% of mothers and vacuum extraction accounted for 7.2% of women who gave birth nationally.<sup>41</sup> By 2016, forceps were used in 5.2% of women giving birth and vacuum extraction in 7.6% of women.<sup>39</sup>

Anecdotally, the practices around perineal support during second stage have changed in recent years. Historically, the Ritgen's manoeuvre was taught and practised widely. This involves the accoucher applying pressure on the perineum with one hand and applying pressure to the baby's head with the other hand to slow the speed of the birth of the baby's head. This was generally done with the woman giving birth on a bed in the supine or lithotomy position. More recently, women have been giving birth upright or in hands-and-knees positions and in some contexts (especially in birth centres or at home) in water. This has inevitably altered the practices and a hands-off or poised approach has become more common. There is little research on the views and experiences of midwives or doctors in relation to practices around perineal integrity. One study of midwives from five hospitals in New South Wales,<sup>42</sup> showed that there had been a shift in teaching of hands-on to hands-poised. Almost two-thirds (63%) of midwives preferred hands-off or poised for a woman having a low-risk birth although 84% reported switching to hands-on if they felt there was a risk of an impending third or fourth degree tear.

Warm compresses to the perineum have increasingly gained traction in Australian maternity settings with many policies now recommending them. Australian research undertaken more than a decade ago showed a high degree of acceptability among midwives with many stating they would use them in the future. It is likely that this research has been taken up in the past 5-10 years although it is probably not routine practice in all hospitals yet.<sup>43</sup>

Ascertainment of perineal tears has also improved in recent years with an increased emphasis in many hospitals on diagnosis and classification. This may be accounting for the higher rates recorded in Australia compared to other OECD countries. It is also possible that this attention to diagnosis, classification and reporting may not be consistent across all hospital sectors or public/private facilities.

## 7.2 Recommendations for preventing and managing perineal tears in light of the literature reviewed

A number of recommendations are made in relation to the findings from this review. These include:

- I.** Efforts should be made to develop a national clinical care standard that addresses prevention and management of perineal tears in collaboration with women, professional colleges and organisations and health services.
- II.** Information for women should be readily available to enable them to make clear decisions about clinical practices. Consumer information produced by the RCOG is one example that might be useful to adapt.<sup>2</sup>
- III.** Education and training of midwives and doctors in perineal anatomy and classification of perineal tears needs to occur using a nationally available, standardised package or program, preferably online. This would address correct classification and diagnosis of the perineal type ('degree') and hence guide appropriate management and care by skilled staff.<sup>3</sup>
- IV.** Continuity of care from midwives and doctors needs to be enabled so that women feel safe and supported when undergoing repair and postpartum management after severe perineal trauma.
- V.** Inclusion of women's views in all future research into the prevention and management of severe perineal trauma. This needs to go beyond the simplistic measurement of 'satisfaction' using a scale and include women's perceptions of acceptability, quality, communication, choice and respect.

## 8 Conclusion

This structured evidence-based literature review was undertaken to better understand the current clinical environment for preventing and managing third- and fourth-degree perineal tears and to identify issues or gaps that may be addressed by clinical experts at a clinical roundtable.

The review includes an analysis of international, national and some local policies and guidelines as well as a review of 26 systematic reviews. There was a high degree of consistency across guidelines and the evidence on preventative practices although it is evident that different practices have evolved across Australia in the past decade.

The development of a national clinical care standard should assist to bring women, clinicians and health services together to agree upon the way forward to improve outcomes for all women.

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## Appendices

### Appendix A: Professional colleges, associations and guideline agencies

Guideline authority	National Institute for Health and Care Excellence (NICE)
Guideline	Intrapartum care for healthy women and babies
Year updated	2017
Weblink	<a href="https://pathways.nice.org.uk/pathways/intrapartum-care#path=view%3A/pathways/intrapartum-care/care-in-second-stage-of-labour.xml&amp;content=view-node%3Anodes-interventions-to-reduce-perineal-trauma">https://pathways.nice.org.uk/pathways/intrapartum-care#path=view%3A/pathways/intrapartum-care/care-in-second-stage-of-labour.xml&amp;content=view-node%3Anodes-interventions-to-reduce-perineal-trauma</a>
Reference	7
Relevant recommendation	<p><b>Do not perform</b> perineal massage in the second stage of labour.</p> <p>Either the 'hands on' (guarding the perineum and flexing the baby's head) or the 'hands poised' (with hands off the perineum and baby's head but in readiness) technique can be used to facilitate spontaneous birth.</p> <p><b>Do not offer</b> lidocaine spray to reduce pain in the second stage of labour.</p> <p><b>Do not carry out</b> a routine episiotomy during spontaneous vaginal birth.</p> <p>Inform any woman with a history of severe perineal trauma that her risk of repeat severe perineal trauma is not increased in a subsequent birth, compared with women having their first baby.</p> <p><b>Do not offer</b> episiotomy routinely at vaginal birth after previous third- or fourth-degree trauma.</p> <p>In order for a woman who has had previous third- or fourth-degree trauma to make an informed choice, talk with her about the future mode of birth, encompassing:</p> <ul style="list-style-type: none"> <li>• current urgency or incontinence symptoms</li> <li>• the degree of previous trauma</li> <li>• risk of recurrence</li> <li>• the success of the repair undertaken</li> </ul>

	<ul style="list-style-type: none"> <li>• the psychological effect of the previous trauma</li> <li>• management of her labour.</li> </ul> <p>Inform any woman with infibulated genital mutilation of the risks of difficulty with vaginal examination, catheterisation and application of fetal scalp electrodes. Inform her of the risks of delay in the second stage and spontaneous laceration together with the need for an anterior episiotomy and the possible need for defibulation in labour.</p>
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Professional college	Royal College of Obstetricians and Gynaecologists (RCOG)
Guideline	The Management of Third- and Fourth-Degree Perineal Tears – Greentop Guideline No. 29
Year updated	2015
Weblink Reference	<a href="https://www.rcog.org.uk/globalassets/documents/guidelines/gtg-29.pdf">https://www.rcog.org.uk/globalassets/documents/guidelines/gtg-29.pdf</a> 4
Key recommendations	<p><b>Classification and terminology</b></p> <p>It is recommended that the classification outlined in this guideline be used when describing any obstetric anal sphincter injury. If there is any doubt about the degree of third-degree tear, it is advisable to classify it to the higher degree rather than the lower degree.</p> <p><b>Prediction and prevention of obstetric anal sphincter injury</b></p> <p>Clinicians need to be aware of the risk factors for obstetric anal sphincter injuries (OASI). Clinicians should be aware, however, that risk factors do not allow the accurate prediction of OASI.</p> <p>Clinicians should explain to women that the evidence for the protective effect of episiotomy is conflicting. Mediolateral episiotomy should be considered in instrumental deliveries.</p> <p>Where episiotomy is indicated, the mediolateral technique is recommended, with careful attention to ensure that the angle is 60 degrees away from the midline when the perineum is distended.</p> <p>Perineal protection at crowning can be protective</p> <p>Warm compression during the second stage of labour reduces the risk of OASI.</p>



**Identification of obstetric anal sphincter injuries**

- All women having a vaginal delivery are at risk of sustaining OASI or isolated rectal buttonhole tears. They should therefore be examined systematically, including a digital rectal examination, to assess the severity of damage, particularly prior to suturing.

**Repair of OASI**

- Repair of third- and fourth-degree tears should be conducted by an appropriately trained clinician or by a trainee under supervision.
- Repair should take place in an operating theatre, under regional or general anaesthesia, with good lighting and with appropriate instruments. If there is excessive bleeding, a vaginal pack should be inserted and the woman should be taken to the theatre as soon as possible. Repair of OASI in the delivery room may be performed in certain circumstances after discussion with a senior obstetrician.
- Figure of eight sutures should be avoided during the repair of OASI because they are haemostatic in nature and may cause tissue ischaemia.
- A rectal examination should be performed after the repair to ensure that sutures have not been inadvertently inserted through the anorectal mucosa. If a suture is identified it should be removed.
- The torn anorectal mucosa should be repaired with sutures using either the continuous or interrupted technique.
- Where the torn internal anal sphincter (IAS) can be identified, it is advisable to repair this separately with interrupted or mattress sutures without any attempt to overlap the IAS.
- For repair of a full thickness external anal sphincter (EAS) tear, either an overlapping or an end-to-end (approximation) method can be used with equivalent outcomes. For partial thickness (all 3a and some 3b) tears, an end-to-end technique should be used.
- 3-0 polyglactin should be used to repair the anorectal mucosa as it may cause less irritation and discomfort than polydioxanone (PDS) sutures.
- When repair of the EAS and/or IAS muscle is being performed, either monofilament sutures such as 3-0 PDS or modern braided sutures such as 2-0 polyglactin can be used with equivalent outcomes.
- When obstetric anal sphincter repairs are being performed, the burying of surgical knots beneath the superficial perineal muscles is recommended to minimise the risk of knot and suture migration to the skin

- Obstetric anal sphincter repair should be performed by appropriately trained practitioners.
- Formal training in anal sphincter repair techniques should be an essential component of obstetric training.

#### **Post-operative care**

- The use of broad-spectrum antibiotics is recommended following repair of OASI to reduce the risk of postoperative infections and wound dehiscence.
- The use of postoperative laxatives is recommended to reduce the risk of wound dehiscence. Bulking agents should not be given routinely with laxatives.
- Local protocols should be implemented regarding the use of antibiotics, laxatives, examination and follow-up of women with obstetric anal sphincter repair.
- Women should be advised that physiotherapy following repair of OASI could be beneficial. Women who have undergone obstetric anal sphincter repair should be reviewed at a convenient time (usually 6–12 weeks postpartum).
- Where possible, review should be by clinicians with a special interest in OASI. If a woman is experiencing incontinence or pain at follow-up, referral to a specialist gynaecologist or colorectal surgeon should be considered.
- Women should be advised that 60–80% of women are asymptomatic 12 months following delivery and EAS repair.

#### **Future deliveries**

- All women who sustained OASI in a previous pregnancy should be counselled about the mode of delivery and this should be clearly documented in the notes.
- The role of prophylactic episiotomy in subsequent pregnancies is not known and therefore an episiotomy should only be performed if clinically indicated.
- All women who have sustained OASI in a previous pregnancy and who are symptomatic or have abnormal endoanal ultrasonography and/or manometry should be counselled regarding the option of elective caesarean birth.

#### **Risk management**

	<ul style="list-style-type: none"> <li>• Units should have a clear protocol for the management of OASI.</li> <li>• Documentation of the anatomical structures involved, the method of repair and the suture materials should be made.</li> <li>• The woman should be fully informed about the nature of her tear and the offer of follow-up should be made, all supported by relevant written information.</li> </ul>
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Professional college	Royal Australian and New Zealand College of Obstetricians and Gynaecologists (RANZCOG)
Guideline	Refers to the RCOG guideline (see above)
Year updated	2015
Weblink	<a href="https://www.ranzcog.edu.au/RANZCOG_SITE/media/RANZCOG-MEDIA/Women%27s%20Health/Statement%20and%20guidelines/Clinical-Obstetrics/RCOG-Management-of-Third-and-Fourth-Degrees-Perineal-Tears.pdf?ext=.pdf">https://www.ranzcog.edu.au/RANZCOG_SITE/media/RANZCOG-MEDIA/Women%27s%20Health/Statement%20and%20guidelines/Clinical-Obstetrics/RCOG-Management-of-Third-and-Fourth-Degrees-Perineal-Tears.pdf?ext=.pdf</a>

Professional college	Australian College of Midwives (ACM)
Guideline	National Midwifery Guidelines for Consultation and Referral (3rd Edition; Issue 2)
Year updated	2017
Weblink Reference	<a href="https://www.midwives.org.au/resources/national-midwifery-guidelines-consultation-and-referral">https://www.midwives.org.au/resources/national-midwifery-guidelines-consultation-and-referral</a> 8
	Third or fourth degree perineal tear – Category C for consultation and referral which means refer a woman or her infant to a medical practitioner for Secondary or Tertiary care

Professional college	American College of Obstetricians and Gynaecologists
Guideline	ACOG Practice Bulletin No. 198: Prevention and Management of Obstetric Lacerations at Vaginal Delivery
Year updated	2018
Reference	<sup>44</sup>
Key recommendations	<b>The following recommendations are based on good and consistent scientific evidence (Level A):</b> Because application of warm perineal compresses during pushing reduces the incidence of third-degree and

	<p>fourth-degree lacerations, obstetrician–gynecologists and other obstetric care providers can apply warm compresses to the perineum during pushing to reduce the risk of perineal trauma. Restrictive episiotomy use is recommended over routine episiotomy. For full-thickness external anal sphincter lacerations, end-to-end repair or overlap repair is acceptable</p> <p><b>The following recommendations are based on limited or inconsistent scientific evidence (Level B):</b> A single dose of antibiotic at the time of repair is reasonable in the setting of obstetric anal sphincter injuries. Perineal massage during the second stage of labor may help reduce third-degree and fourth-degree lacerations. If there is need for episiotomy, mediolateral episiotomy may be preferred over midline episiotomy because of the association of midline episiotomy with increased risk of injury to the anal sphincter complex; however, limited data suggest mediolateral episiotomy may be associated with an increased likelihood of perineal pain and dyspareunia. Either standard suture or adhesive glue may be used to repair a hemostatic first-degree laceration or the perineal skin of a second-degree laceration. Continuous suturing of a second-degree laceration is preferred over interrupted suturing.</p> <p><b>The following recommendations are based primarily on consensus and expert opinion (Level C):</b> Stool softeners and oral laxatives should be prescribed to women who sustain OASI, and counseling postpartum should include discussing ways to avoid constipation. Women who have a history of OASI should be counseled that the absolute risk of a recurrent OASI is low with a subsequent vaginal delivery; however, it is reasonable to perform a cesarean delivery based on patient request after advising of the associated risks. If the internal anal sphincter can be adequately identified, repair has been recommended either as a part of the distal portion of the reinforcing second layer of the rectal muscularis using a 3-0 polyglactin suture or separately from the external anal sphincter using a 3-0 monofilament polydioxanone suture.</p>
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Professional college	Society of Obstetricians and Gynecologists of Canada (SOGC)
Guideline	No. 148-Guidelines for Operative Vaginal Birth
Year updated	2018

Weblink Reference	<a href="https://www.jogc.com/article/S1701-2163(17)31107-6/abstract">https://www.jogc.com/article/S1701-2163(17)31107-6/abstract</a> 45
Relevant recommendation	Routine episiotomy is not necessary for an assisted vaginal birth (II-IE).

Professional college	Society of Obstetricians and Gynecologists of Canada (SOGC)
Guideline	Obstetrical Anal Sphincter Injuries (OASI): Prevention, Recognition, and Repair
Year updated	2015
Weblink Reference	<a href="https://sogc.org/wp-content/uploads/2015/12/gui330CPG1512E4.pdf">https://sogc.org/wp-content/uploads/2015/12/gui330CPG1512E4.pdf</a> 46
Relevant recommendation	<ol style="list-style-type: none"> <li>1. All women should be carefully examined for perineal or vaginal tears; those with a tear that is more than superficial in depth should have a systematic rectal examination for obstetrical anal sphincter injury prior to repair. (II-2B)</li> <li>2. The World Health Organization classification should be used to classify obstetrical anal sphincter injury. This distinguishes the degree of external sphincter tear (3a: &lt; 50% or 3b: ≥ 50%) and the presence of internal sphincter defects (3c). A button-hole injury is distinct and should be classified separately as such. (III-B)</li> <li>3. In women having a spontaneous vaginal delivery, the rate of obstetrical anal sphincter injury is decreased when the obstetrical care provider slows the fetal head at crowning. (II-2A)</li> <li>4. Episiotomy: a. At the time of either a spontaneous vaginal or instrumental delivery, the obstetrical care provider should follow a policy of “restricted” episiotomy (i.e., only if indicated), rather than “liberal” use (i.e. routine), for the prevention of obstetrical anal sphincter injuries. (I-A) b. If an episiotomy is deemed indicated, preference for a mediolateral over a midline should be considered. (II-2B) The optimal cutting angle appears to be no less than 45 degrees, ideally around 60 degrees. (II-2B)</li> <li>5. Repair can be delayed for 8 to 12 hours with no detrimental effect. Delay may be required so a more experienced care provider is available for the repair. (I-A)</li> <li>6. Prophylactic single dose intravenous antibiotics (2nd generation cephalosporin, e.g. cefotetan or cefoxitin) should be administered for the reduction of perineal wound complications following the repair</li> </ol>

	<p>of obstetrical anal sphincter injury. (I-A)</p> <ol style="list-style-type: none"> <li>7. Laxatives (e.g., lactulose) should be prescribed following the primary repair of obstetrical anal sphincter injury as they are associated with earlier and less painful first bowel motions and earlier discharge from hospital. Constipating agents and bulking agents are not recommended. (I-A)</li> <li>8. Non-steroidal anti-inflammatories and acetaminophen are the first-line analgesics. Opioids should only be used with caution. Constipation should be avoided by using a laxative or stool softener. (I-A)</li> <li>9. Following obstetrical anal sphincter injury, providers should disclose to women the degree of injury and arrange follow-up. Detailed documentation of the injury and its repair is required. (III-L)</li> <li>10. Women with anal incontinence following obstetrical anal sphincter injury should be referred for pelvic floor physiotherapy. (I-A)</li> </ol>
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Membership association	Women's Healthcare Australasia (WHA)
Guideline	WHA National Collaborative: Intervention Bundle
Year updated	2018
Weblink	<a href="https://women.wcha.asn.au/sites/default/files/wha_intervention_bundle_final_12_12_2017.pdf">https://women.wcha.asn.au/sites/default/files/wha_intervention_bundle_final_12_12_2017.pdf</a>
Relevant recommendation	<p><b>FOR ALL WOMEN</b></p> <p>Apply warm perineal compresses during the second stage of labour at the commencement of perineal stretching. With a spontaneous vaginal delivery, using gentle verbal guidance, to encourage a slow controlled birth of the fetal head and shoulders</p> <ul style="list-style-type: none"> <li>• support the perineum with the dominant hand</li> <li>• apply counter-pressure on the fetal head with the non-dominant hand</li> <li>• if shoulders do not deliver spontaneously, apply gentle traction to release the anterior shoulder</li> <li>• allow the posterior shoulder to be released following the curve of Carus</li> </ul> <p><b>WHEN EPISIOTOMY IS INDICATED</b></p> <p>Episiotomy should be performed: at crowning of the fetal head using a medio-lateral incision at a minimum 60 degree angle from the posterior fourchette</p> <p>NB. An episiotomy is indicated for all women having their first vaginal birth requiring a forceps or ventouse</p>

	<p>assisted delivery</p> <p><b>FOR ALL WOMEN</b></p> <p>Genito-anal examination following birth</p> <ul style="list-style-type: none"><li>• needs to be performed by an experienced clinician</li><li>• include a PR examination on all women, including those with an intact perineum</li></ul> <p>All perineal trauma should be</p> <ul style="list-style-type: none"><li>• graded according to the RCOG grading guideline</li><li>• reviewed by a second experienced clinician to confirm the diagnosis &amp; grading</li></ul>
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### Appendix B: State and territory guidelines

State or territory	Western Australia
Guideline	Management of 3rd & 4th Degree Perineal Trauma: Clinical Guidelines - : Obstetrics & Midwifery
Year updated	2014
Weblink/Reference	<sup>47</sup>
Key points	<p>This is based on the RCOG guideline. It provides broad guidance including:</p> <ul style="list-style-type: none"> <li>• If there is perineal injury then explain the importance and gain the woman's consent to perform a rectal examination. If there is a tear that involves only the rectal mucosa, and there is an intact anal sphincter complex (Buttonhole tear), then this should be documented as a separate entity. If not identified and repaired, it may cause a rectovaginal fistulae.</li> <li>• If there is doubt to the degree of third degree tear, classify it to the higher degree.</li> <li>• When an episiotomy is indicated (e.g. if indicated at an instrumental birth), carefully angling the cut away from the midline using the mediolateral technique is recommended. A lower risk of third degree tear is associated with a larger angle of episiotomy (i.e. at the 8 o'clock position).</li> <li>• Provide a systematic examination, for all women having a vaginal birth with evidence of genital trauma, to assess the degree of trauma prior to suturing.</li> <li>• All women who had an operative vaginal birth or experienced perineal injury should be examined by an experienced practitioner trained in the recognition and management of perineal tears.</li> <li>• Repair of third and fourth degree tears needs to be carried out by an appropriately trained practitioner, in an environment that provides adequate lighting and visualisation of the perineum</li> <li>• Third and fourth degree repairs should be conducted in the operating theatre where there is appropriate lighting, aseptic conditions, instruments and assistance. Additionally, adequate anaesthesia (regional or general) is available, allowing the anal sphincter to relax which is essential for the retrieval of the retracted torn ends of the anal sphincter, for realignment and repair without tension.</li> <li>• During the repair consent process the woman should be informed that the extent of her perineal/anal trauma might not be known until she is assessed under adequate anaesthesia.</li> <li>• A single pre-operative dose of cephazolin 2g IV is recommended before the repair of a third and fourth degree tear. This should be given as early as possible before repair (ideally 15 to 30 minutes prior to the commencement of the operative repair).</li> </ul>



	<ul style="list-style-type: none"> <li>• The role of post-operative antibiotic therapy is unclear, but therapy is recommended following anal sphincter repair because infection in this setting carries a high risk of anal incontinence and fistula formation.</li> <li>• Suture as soon as possible after birth - it is less painful and reduces the risk of infection. Following a water birth, it is advisable to delay suturing for 1 hour following the birth.</li> <li>• Documentation of the repair should include the anatomical structures involved, repair method, suture materials used, and account for instruments, sharps and swabs,<sup>1</sup> and level of supervision.</li> <li>• 13. It is no longer necessary for women to remain in hospital until their bowels have opened.</li> </ul>
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State or territory	Victoria – no statewide guidance – specific hospitals only
Guideline	Guideline: Third and Fourth Degree Tears - Management
Year updated	2017
Weblink/Reference	<sup>48</sup>
Relevant recommendation	<p>This is based on the RCOG guideline. It provides broad practice guidance on:</p> <ul style="list-style-type: none"> <li>• Prediction and prevention</li> <li>• Recognition/identification</li> <li>• Repair technique for third/fourth degree tears</li> </ul>

State or territory	South Australia
Guideline	South Australian Perinatal Practice Guideline: Third and fourth degree tear management
Year updated	2017
Weblink/Reference	<sup>49</sup>
Relevant recommendation	<p>This is based on the RCOG guideline. It provides a Summary of Practice Recommendations:</p> <ul style="list-style-type: none"> <li>• Careful inspection of the perineum, vulva and vagina following birth is essential</li> <li>• Rectal examination prior to suturing is required when the woman has undergone episiotomy or if the tear is extends to the anal verge to determine classification of tear</li> </ul>

	<ul style="list-style-type: none"> <li>• Repair of 3b, 3c and fourth degree tears should be undertaken in theatre with adequate analgesia</li> <li>• Consult a colorectal surgeon if a large fourth degree tear is diagnosed</li> <li>• Antibiotic cover is required for all third and fourth degree tears</li> <li>• Postnatal bladder management requires specific attention</li> <li>• Postnatal follow-up needs to be individualised Recommendations for subsequent births is based on presence of symptoms and the woman's preference</li> </ul>
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State or territory	New South Wales - – no statewide guidance – specific hospitals only
Guideline	Third and fourth degree perineal tears - repair and management
Year updated	2017
Weblink/Reference	<sup>50</sup>
Relevant recommendation	<p>Based on RCOG Greentop Guidelines and provides a series of specific steps for the management and repair including:</p> <ul style="list-style-type: none"> <li>• Perform adequate perineal examination (after verbal consent) for all women sustaining perineal trauma.</li> <li>• This will usually require a rectal examination if there is significant perineal trauma or vaginal lacerations</li> <li>• Call medical officer to inspect the perineum if 3rd or 4th degree tear is suspected</li> <li>• Arrange transfer to theatre for repair, if a 3b, 3c or 4th degree tear is confirmed</li> </ul>

State or territory	Queensland
Guideline	Perineal Care
Year updated	2018
Weblink/Reference	<sup>51</sup>
Relevant recommendations	<p><b>Provides guidance on intrapartum risk reduction strategies for all women:</b></p> <p>Offer in second stage:</p> <ul style="list-style-type: none"> <li>• Perineal warm compresses</li> <li>• Intrapartum perineal massage</li> </ul>

	<p>Support woman to give birth in position they find most comfortable</p> <ul style="list-style-type: none"> <li>• Inform of benefits of all-fours, kneeling, lateral and standing positions</li> <li>• Avoid prolonged periods in birth stool, sitting, lithotomy and squatting positions</li> </ul> <p>Closely observe perineum during second stage</p> <p>Promote slow and gentle birth of fetal head, shoulders and body</p> <p>Communicate clearly, especially in final stages of second stage</p> <p>Use hands on or hands poised technique according to clinical situation</p> <p>Restrict use of mediolateral episiotomy to clinical indications</p> <p>If previous OASI or multiple risk factors, *experienced accoucheur where possible</p> <p>If instrumental birth required:</p> <ul style="list-style-type: none"> <li>• Consider vacuum rather than forceps</li> <li>• Strongly consider use of mediolateral episiotomy, especially with forceps</li> </ul> <p><b>Provides guidance on repair of OASI:</b></p> <p>Undertake repair in theatre except in exceptional cases</p> <p>Avoid figure of eight sutures</p> <p>Trim suture ends and bury knots in deep perineal muscle to avoid suture migration</p> <p><b>Provides specific guidance on repair of EAS, IAS and anorectal mucosa</b></p>
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State or territory	Tasmania
Guideline	No specific state-wide guidance found
Year updated	
Weblink/Reference	
Relevant recommendation	

State or territory	Australian Capital Territory
Guideline	No specific state-wide guidance found
Year updated	
Weblink/Reference	
Relevant recommendation	

State or territory	Northern Territory
Guideline	No specific state-wide guidance found
Year updated	
Weblink/Reference	
Relevant recommendation	

## Appendix C: Systematic reviews

Author	Title	Date	Review objective	Number of studies	Population	Intervention	Comparator	Outcomes relevant to perineal tears	Grade
Aasheim V, Nilsen AB, Reinar LM, Lukasse M.	Perineal techniques during the second stage of labour for reducing perineal trauma	2017	To assess the effect of perineal techniques during the second stage of labour on the incidence and morbidity associated with perineal trauma.	22 (20 trials with data)	Pregnant women and their babies in various countries	Perineal massage Warm and cold compress Hands-on Delivery of posterior versus anterior shoulder first Perineal protection device Different oils/wax	No perineal massage No compress Hands-off Delivery of anterior versus posterior shoulder first No perineal protection device No oils/wax	Intact perineum 1 <sup>st</sup> degree perineal tears 2 <sup>nd</sup> degree perineal tears 3 <sup>rd</sup> or 4 <sup>th</sup> degree tears Episiotomy Perineal trauma requiring suturing	Very-low to moderate
Beckmann M, Stock O.	Antenatal perineal massage for reducing perineal trauma	2013	To assess the effect of antenatal digital perineal massage on the incidence of perineal trauma at birth and subsequent morbidity.	4	Pregnant women, various countries	Digital massage	No massage	1 <sup>st</sup> /2 <sup>nd</sup> degree tears 3 <sup>rd</sup> /4 <sup>th</sup> degree tears Episiotomy Perineal pain Instrumental deliveries Sexual satisfaction Incontinence of urine, faeces, flatus	Moderate
Bonet M, Ota E, Chibueze CE, Oladapo, OT.	Antibiotic prophylaxis for episiotomy repair following vaginal birth	2016	To assess whether routine antibiotic prophylaxis before or immediately after incision or repair of episiotomy for women with an uncomplicated vaginal birth, compared with either placebo or no antibiotic prophylaxis, prevents	1	Pregnant women in Brazil	Oral chloramphenicol 500 mg four times daily for 72 hours after episiotomy repair	No treatment	Incidence of episiotomy wound dehiscence, infection	Very-low

Author	Title	Date	Review objective	Number of studies	Population	Intervention	Comparator	Outcomes relevant to perineal tears	Grade
			maternal infectious morbidities and improves outcomes.						
Brito L, Ferreira C, Duarte G, Nogueira A, Marcolin A	Antepartum use of Epi-No birth trainer for preventing perineal trauma: systematic review	2015	To assess if the Epi-No birth trainer used during antepartum could prevent perineal trauma in nulliparous women.	5	Primiparous women from various countries	Use of epi-no birth trainer	No intervention	Episiotomy Perineal tears Duration of second stage of labour	Low
Bulchandani S, Watts E, Sucharitha A, Yates D, Ismail KM.	Manual perineal support at the time of childbirth: a systematic review and meta-analysis	2015	To assess the effect of routine 'hands on'/manual perineal support (MPS) during childbirth, versus ad hoc/no perineal support ('hands off/poised'), on the risk and degree of perineal trauma.	12	Pregnant women various countries	Hands-on/manual perineal support	Hands-off/no perineal support	Perineal trauma Obstetric Anal Sphincter Injuries (OASI) Perineal pain Urinary/faecal incontinence	Low to moderate
Buppasiri P, Lumbiganon P, Thinkhamrop J, Thinkhamrop B.	Antibiotic prophylaxis for third- and fourth-degree perineal tear during vaginal birth	2014	To assess the effectiveness of antibiotic prophylaxis for reducing maternal morbidity and side effects in third- and fourth-degree perineal tear during vaginal birth.	1	Women with third and fourth degree tears in US hospital	Antibiotic prophylaxis	No treatment for perineal tear	Infection rate at 2 and 6 weeks postpartum	Low to moderate
Du Y, Xu L, Ding L, Wang, Wang Z.	The effect of antenatal pelvic floor muscle training on labor and delivery outcomes:	2015	To investigate the possible effect of antenatal pelvic floor muscle training on labour and delivery.	12	Primiparous women in China, Europe and Latin America	Pelvic floor muscle training	No intervention	Episiotomy Instrumental delivery Perineal laceration	Low to moderate

Author	Title	Date	Review objective	Number of studies	Population	Intervention	Comparator	Outcomes relevant to perineal tears	Grade
	a systematic review with meta-analysis								
Dudley LM, Kettle C, Ismail KM.	Secondary suturing compared to non-suturing for broken down perineal wounds following childbirth	2013	To evaluate the therapeutic effectiveness of secondary suturing of dehisced perineal wounds compared to non-suturing (healing by secondary intention, expectancy).	2	Danish women with a dehisced and/or infected episiotomy	Secondary suturing of dehisced perineal wounds	Secondary intention, expectant management	Wound healing Dyspareunia	Very-low
Fernando RJ, Sultan AH, Kettle C, Thakar R.	Methods of repair for obstetric anal sphincter injury	2013	To compare the effectiveness of overlap repair versus end-to-end repair following OASI in reducing subsequent anal incontinence, perineal pain, dyspareunia and improving quality of life.	6	1. Women who had sustained OASI and in whom the repair was performed in the immediate postpartum period (primary repair).	Immediate primary overlap repair of the anal sphincter	Immediate primary end-to-end repair	Faecal urgency Anal incontinence Perineal pain Dyspareunia Quality of life	Moderate
Jha S, Parker V.	Risk factors for recurrent obstetric anal sphincter injury (rOASI): a systematic review and meta-analysis	2016	The objective of this study was to estimate the risk of recurrent obstetric anal sphincter injury (rOASI) in women who have suffered anal sphincter injury in their previous pregnancy and analyse risk factors for recurrence through a systematic review and meta-analysis.	8	Women who had sustained an obstetric anal sphincter injury in their first pregnancy from Australia, Scandinavia,	Recurrent Obstetric Anal Sphincter Injury	No intervention	Instrumental delivery with forceps Previous fourth degree tear Advanced maternal age	Low to high

Author	Title	Date	Review objective	Number of studies	Population	Intervention	Comparator	Outcomes relevant to perineal tears	Grade
					Ireland, UK and the USA				
Jiang H, Qian X, Carroli G, Garner P.	Selective versus routine use of episiotomy for vaginal birth	2017	To assess the effects on mother and baby of a policy of selective episiotomy ('only if needed') compared with a policy of routine episiotomy ('part of routine management') for vaginal births.	12	Pregnant women and their babies in various countries	Routine episiotomy	Selective episiotomy	Severe perineal/vaginal trauma Blood loss Perineal infection Perineal pain (moderate or severe) Dyspareunia Urinary incontinence Genital prolapse	Low to moderate
LaCross A, Groff M, Smaldone A	Obstetric Anal Sphincter Injury and Anal Incontinence Following Vaginal Birth: A Systematic Review and Meta-Analysis	2015	To systematically review current evidence for the relationship between obstetric anal sphincter injury (ie, episiotomy and third- or fourth-degree perineal lacerations) and anal incontinence in parous women.	19	Pregnant women, various countries	Obstetric Anal Sphincter Injury (Episiotomy or third-/fourth-degree tear)	No Obstetric Anal Sphincter Injury	Anal incontinence	Moderate
Lemos A, Amorim M, Dornelas de Andrade A, de Souza AI, Cabral JE, Correia JB.	Pushing/bearing down methods for the second stage of labour	2017	To evaluate the benefits and possible disadvantages of different kinds of techniques regarding maternal pushing/breathing during the expulsive stage of labour on maternal and fetal outcomes.	21	Pregnant women in various countries	Type of pushing: directed  In women with an epidural→ Timing of pushing: immediate	Type of pushing: spontaneous  In women with an epidural→ Timing of pushing:	Duration of second stage of labour 3 <sup>rd</sup> and 4 <sup>th</sup> degree perineal laceration Episiotomy	Very-low to moderate



Author	Title	Date	Review objective	Number of studies	Population	Intervention	Comparator	Outcomes relevant to perineal tears	Grade
							delayed	Duration of pushing	
Lodge F, Haith-Cooper M.	The effect of maternal position at birth on perineal trauma: A systematic review	2016	To assess whether different maternal positions at birth affect the incidence and degree of perineal trauma.	7	Women following a natural vaginal birth in UK, Europe, Australia.	Natural/upright birth positions—standing, all fours, on knees, squatting, in water, birth-stool, semi-recumbent position (trunk tilted forwards up to 30° to the horizontal)	Natural/upright birth positions—standing, all fours, on knees, squatting, in water, on a birth-stool, semirecumbent position (trunk tilted forwards up to 30° to the horizontal)	Intact perineum Perineal trauma (including grazes, anterior perineal trauma, first-, second-, third- and fourth-degree tears)	Moderate
Lund N, Pearson L, Jango H, Gommesson D, Westergaard H.	Episiotomy in vacuum-assisted delivery affects the risk of obstetric anal sphincter injury: a systematic review and meta-analysis.	2016	To assess whether mediolateral or lateral episiotomy affects the risk of OASI in vacuum-assisted delivery among primiparous women.	15	Women who had a vacuum-assisted delivery	Mediolateral/lateral episiotomy	No intervention	Obstetric Anal Sphincter Injury	Moderate
Morris A, Berg M, Dencker A.	Professional's skills in assessment of perineal tears after childbirth— A systematic review	2013	To review research that investigates healthcare professionals' clinical knowledge in assessment and classification of perineal tears in connection with childbirth.	6	Doctors and midwives working in obstetrics	Healthcare professionals' knowledge in assessing and classifying perineal tears	Healthcare professionals' knowledge in assessing and classifying perineal tears	Health professional knowledge of perineum anatomy, perineal tear classification, perception of	Very-low to low

Author	Title	Date	Review objective	Number of studies	Population	Intervention	Comparator	Outcomes relevant to perineal tears	Grade
								knowledge and training in perineal assessment	
O'Mahony F, Hofmeyr GJ, Menon V	Choice of instruments for assisted vaginal delivery	2010	To evaluate different instruments in terms of achieving a vaginal birth and avoiding significant morbidity for mother and baby.	32	Women in the second stage of labour due for instrumental vaginal delivery.	Forceps vs vacuum extraction	Any forceps vaginal birth Any vacuum vaginal birth Specific type of forceps vaginal birth Specific type of vacuum vaginal birth	Third- or fourth-degree perineal tear (with or without episiotomy)	Moderate
Pergialiotis V, Vlachos D, Protopapas A, Pappa K, Vlachos G.	Risk factors for severe perineal lacerations during childbirth	2014	To identify factors that lead to the occurrence of severe perineal lacerations.	22	Pregnant women, various countries	Presence of risk factors: Macrosomic infant Operative vaginal delivery Epidural anaesthesia Labour induction Labour augmentation Asian ethnicity Persistent occiput posterior presentation	Absence of risk factors	Perineal lacerations	Low
Petrocnik P, Marshall J.	Hands-poised technique: The	2015	To systematically review all available literature that compares the hands-on and	5	Pregnant women, various	Hand-on	Hands-poised (hands-off)	Perineal trauma Episiotomy	Very-low

Author	Title	Date	Review objective	Number of studies	Population	Intervention	Comparator	Outcomes relevant to perineal tears	Grade
	future technique for perineal management of second stage of labour? A modified systematic literature review		hands-poised techniques of perineal management during the second stage of labour.		countries			Postpartum haemorrhage Postpartum perineal pain	
Phipps H, de Vries B, Hyett J, Osborn DA.	Prophylactic manual rotation for fetal malposition to reduce operative delivery	2014	To assess the effect of prophylactic manual rotation for women with malposition in labour on mode of delivery, and maternal and neonatal outcomes.	1	Women with cephalic, singleton pregnancies	Manual rotation	Routine care (no manual rotation)	Operative delivery (caesarean or instrumental)	Moderate
Van Kampen M, Devoogdt N, De Groef A, Gielen A, Geraerts I.	The efficacy of physiotherapy for the prevention and treatment of prenatal symptoms: a systematic review	2015	To assess the effectiveness of prenatal physiotherapy.	54	Women who engaged in various prenatal physiotherapy techniques	Various prenatal physiotherapy techniques (antenatal perineal massage)	Routine care (no antenatal perineal massage)	Perineal pain Third- and fourth degree tears Episiotomy	Low
Vergheze T, Champaneria R, Kapoor D, Latthe P.	Obstetric anal sphincter injuries after episiotomy: systematic review and	2016	To compare rates of OASI amongst women who had undergone mediolateral episiotomy versus those who did not.	16	Pregnant women (majority nulliparous), various countries	Mediolateral episiotomy	No intervention	Obstetric Anal Sphincter Injury	Very-low

Author	Title	Date	Review objective	Number of studies	Population	Intervention	Comparator	Outcomes relevant to perineal tears	Grade
	meta-analysis								
Walsh KA, Grivell RM.	Use of endoanal ultrasound for reducing the risk of complications related to anal sphincter injury after vaginal birth	2015	To evaluate the effectiveness of EAUS in the detection of OASI following vaginal birth and in reducing the risk of anal sphincter complications related to OASI.	1	Primiparous women with clinically detectable second degree tears	Assessment with endoanal ultrasound prior to perineal repair	Standard care	Severe anal incontinence Perineal pain	Moderate
Wang H, Jayasekara R, Warland J.	The effect of 'hands on' techniques on obstetric perineal laceration: a structured review of the literature	2015	To review current evidence of "hands on" and "hands off" techniques as it relates to rates of perineal laceration in order to provide direction for future research in this important area of midwifery practice.	9	Women having a vaginal birth	'Hands-on'	'Hands-off'	Perineal lacerations Episiotomy	Low
Webb S, Yates D, Manresa M, Parsons M	Impact of subsequent birth and delivery mode for women with previous OASI: systematic review and meta-analysis.	2017	To evaluate the impact of subsequent birth and its mode on anal incontinence (AI) and/or quality of life (QoL), for women with previous OASI.	14	Women with previous OASI	Caesarean section	Vaginal birth	Anal incontinence Quality of life	Low
Wuytack F, Smith V, Cleary BJ.	Oral non-steroidal anti-inflammatory	2016	To determine the effectiveness of a single dose of an oral NSAID for relief of acute perineal pain in the early postpartum	28	Women with perineal pain in the early	Non-steroid anti-inflammatories	Placebo Or Paracetamol	Adequate pain relief and need for adequate	Very low to low

Author	Title	Date	Review objective	Number of studies	Population	Intervention	Comparator	Outcomes relevant to perineal tears	Grade
	drugs (single dose) for perineal pain in the early postpartum period		period.		postpartum period			analgesia at 4 and 6 hours postpartum Maternal drug adverse effects	

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