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No. 465, January, 2026 (Replaces No. 330, December 2015, in conjunction with No. 457 (2024))

Guideline No. 465: Obstetrical Anal Sphincter Injuries (OASIs) Part II: Long-Term Management and Counselling Regarding Subsequent Mode of Delivery

(En français : Directive n° 465: Lésions obstétricales du sphincter anal (LOSA) Partie II : Prise en charge à long terme et conseils concernant le mode d'accouchement ultérieur)

The English document is the original version; translation may introduce small differences in the French version.

This clinical practice guideline was prepared by the authors, reviewed by the SOGC Clinical Obstetrics Committee (2025), and approved by the SOGC Guideline Management and Oversight Committee (2025).
This clinical practice guideline, in conjunction with No. 457 Obstetrical Anal Sphincter Injuries (OASIS) Part I: Prevention, Recognition, and Immediate Management (2024), supersedes No. 330, published in December 2015.

Authors

Maria Giroux, MD, Regina, SK
Alison Carter Ramirez, MD, Calgary, AB
Sinead Dufour, PT, PhD, Hamilton, ON
Dobrochna Globerman, MD, Winnipeg, MB
Maryse Larouche, MD, MPH, Vancouver, BC
Dante Pascali, MD, Ottawa, ON
Abdul Sultan, MD, Croydon, UK

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Informed consent: Patients have the right and responsibility to make informed decisions about their care, in partnership with their health care provider. To facilitate informed choice, patients should be provided with information and support that is evidence-based, culturally appropriate, and personalized. Their values, beliefs, and individual needs and personal circumstances should be considered and the final decision regarding care and treatment options chosen by the patient should be respected.

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Weeks Gestation Notation: The authors follow the World Health Organization's notation on gestational age: the first day of the last menstrual period is day 0 (of week 0); therefore, days 0 to 6 correspond to completed week 0, days 7 to 13 correspond to completed week 1, etc.

SOGC Clinical Obstetrics Committee (2025): Francois Audibert, Isabelle Boucoiran, Elissa Cohen, Jillian Coolen, Stephanie Cooper, Marie-Danielle Dionne, Ernesto Figueiro Filho, Megan Gomes, Sebastian Hobson, Kenneth Lim, Christopher Nash, Kirsten Niles, Graeme Smith, Sakina Walji, Georgina Wilcock, Karen Wou

SOGC Guideline Management Oversight Committee (2025): Melanie Basso, Jocelynn Cook, Diane Francoeur, Bing Guthrie, Kristin Harris, Sarah Healey, Venu Jain, Amy Metcalfe, N. Lynne McLeod, Ally Murji, Jessica Papillon-Smith, Vanessa Poliquin, Frank Potestio (Co-chair), Anita Smith, R. Douglas Wilson (Co-chair)

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Corresponding Author: Maria Giroux, MD, Regina, SK, centreforoasis@gmail.com

RECOMMENDED CHANGES IN PRACTICE

1. All postpartum women with a clinical diagnosis of obstetric anal sphincter injury and pregnant women with history of obstetric anal sphincter injury require an assessment by an experienced, or assessment in a dedicated clinic when feasible.
2. Counselling regarding subsequent mode of delivery after obstetric anal sphincter injury should incorporate the algorithms in this guideline as decision-support tools to facilitate informed, shared decision-making.
3. All postpartum women with an obstetric anal sphincter injury should be referred for pelvic health physiotherapy.

KEY MESSAGES

1. All postpartum women with a clinical diagnosis of obstetric anal sphincter injury (OASI) and pregnant women with previous OASI require follow-up with an experienced provider including history, physical examination, investigations, and counselling. The creation and continued development of existing dedicated multidisciplinary clinics for women with OASIs is essential to facilitate specialized care nationally.
2. For women with OASI, it is important to assess both integrity and function of the anal sphincter complex. Endoanal ultrasound and anorectal manometry are the preferred investigations for assessing structural integrity and function, however, transperineal ultrasound is an acceptable alternative when endoanal imaging is not available. Function can be assessed by anal manometry, when available or single digital rectal examination which may offer a basic clinical assessment, though it is subjective and cannot substitute for the detailed information provided by manometry.
3. Pelvic health physiotherapy improves pelvic floor symptoms in postpartum women with OASI. It is important to educate women about the benefits of pelvic health physiotherapy and advocate for affordable access to this important treatment modality.
4. All women with a history of OASI require counselling and shared decision making regarding the subsequent mode of delivery using a collaborative approach. Obstetrical care providers can utilize algorithms presented in this guideline for counselling regarding subsequent mode of delivery with the knowledge that future research is required in this area.

GOOD PRACTICE POINTS

1. Educational resources should be provided to antepartum and postpartum women regarding perineal lacerations, postpartum pelvic floor recovery, and importance of pelvic health or alternatives when not accessible.
2. Birthing facilities should regularly audit episiotomy and OASI rates, documentation of obstetrical trauma, management, patient counselling, and adherence to best practices to support continuous quality improvement.

ABSTRACT

Objective: The purpose of this guideline is to provide recommendations regarding long-term management for women with obstetric anal sphincter injuries (OASIs) and to describe the role of dedicated clinics. This guideline also presents key components and new algorithms for counselling and shared decision-making regarding subsequent mode of delivery post-OASIs.

Target Population: Women who have had prior obstetric anal sphincter injuries (OASIs).

Benefits, Harms, and Costs: Timely access to appropriate care is essential to reducing the significant burden of stigma, emotional distress, and financial hardship associated with complications from obstetric anal sphincter injuries (OASIs). Dedicated follow-up clinics and access to pelvic health physiotherapy play a critical role in recovery and long-term outcomes. These services must be accessible to all women, regardless of geographic location.

Women should receive clear and comprehensive information about the potential benefits of referral to specialized centers, including the possibility of better long-term prognosis when managed in these settings. Such knowledge is vital for informed decision-making around future care, including mode of delivery after an OASI.

Given the current scarcity of specialized services in regional and remote areas, there is a pressing need to improve equitable access across all geographic settings. Innovative models of care, such as telehealth and local provider training, should be expanded to reduce disparities in outcomes; access to these essential referrals and services should not limited by economic barriers. As with any other medically indicated referral, the costs associated with travel, treatment, and follow-up should be covered to guarantee that all women, regardless of circumstance, can access the care they need.

Evidence: Published studies were retrieved by searching PubMed, Ovid, MEDLINE, Embase, SCOPUS, and Cochrane Library

databases from September 1, 2014 to July 1, 2025 using appropriate MeSH terms (delivery, obstetrics, obstetric surgical procedures, obstetric labor complications, anal canal, episiotomy) and keywords (OASIs, obstetrical anal sphincter injury, anal injury, anal sphincter, vaginal delivery, suture, fecal incontinence, anal incontinence, overlap repair, end-to-end repair, bladder protocol, analgesia). Results were restricted to systematic reviews, meta-analyses, randomized controlled trials/controlled clinical trials, observational studies, and clinical practice guidelines. Results were limited to adult females and English- or French-language materials.

Validation Methods: The authors rated the quality of evidence and strength of recommendations using the Grading of Recommendations Assessment, Development and Evaluation (GRADE) approach. See online Appendix A (Tables A1 for definitions and A2 for interpretations of strong and conditional recommendations).

Intended Audience: Obstetricians, urogynaecologists, family physicians, midwives, pelvic health physiotherapists, radiologists, colorectal surgeons, gastroenterologists, nurses, and learners.

Social Media Abstract: Updated Canadian guideline on long-term management of women with obstetric anal sphincter injuries (OASIs) with new algorithms for counselling regarding subsequent mode of delivery.

SUMMARY STATEMENTS:

1. Obstetric anal sphincter injuries are associated with significant morbidity and can have profound physical psychological, emotional, economic, and social implications for women, families, and the health care system *(high).*
2. All women with a clinical diagnosis of OASI should receive timely consultation and follow-up with an experienced provider, consisting of history, physical examination, appropriate investigations, and individualized counselling *(moderate).*
3. Access to specialized services should be equitably available and financial and geographic barriers should not prevent women from receiving the specialized care required to support their recovery, long-term wellbeing, and informed decision-making for future births (*moderate*).
4. It is important to assess both integrity and function of the anal sphincter complex to guide counselling and management for women with OASI. (*moderate*).
5. Further research is required to determine the role of magnetic resonance imaging in the assessment of persistent anal sphincter defects (*low*).
6. The role of vaginal estrogen therapy in postpartum women with OASI requires future research *(high).*
7. Pelvic health physiotherapy has demonstrated benefits in women who have sustained OASI (*high*).
8. It is important to counsel and empower women to make an informed decision regarding subsequent mode of delivery using a collaborative approach (*high*).
9. Although elective cesarean section eliminates the risk of recurrent obstetric anal sphincter injury, anorectal symptoms are multifactorial. Elective cesarean section does not prevent/reverse symptoms resulting from the previous OASI *(moderate).*
10. The risk of recurrent obstetric anal sphincter injury is 5.3% in Canadian women. The risk of long-term anal incontinence is 12-54% after subsequent delivery *(moderate).*

RECOMMENDATIONS:

1. Obstetrical care providers should refer all postpartum women with a clinical diagnosis of OASI and pregnant women with previous OASI to a dedicated clinic. If a dedicated clinic is not available, follow-up should be arranged with an experienced provider with referral to appropriate specialists as indicated *(conditional, moderate).*
2. All women with clinical diagnosis of OASI (3^{rd} or 4^{th} degree) should have birth debriefing, assessment of physical and emotional recovery, identification and management of current short-term and long-term complications, education, emotional support, counselling regarding subsequent mode of delivery, and discussion regarding prevention of pelvic floor disorders in the future *(strong, moderate).*
3. Women with subsequent pregnancy post-OASI should be counselled regarding subsequent mode of delivery (*strong, moderate*).
4. Trained clinicians should use endoanal ultrasound to assess the structure and anorectal manometry to assess the function of the anal sphincter complex to inform recommendations regarding management of current anorectal symptoms, subsequent mode of delivery, and identify women at greater risk of developing anorectal symptoms in the future *(strong, high).*
5. Due to the possibility of a missed OASI, women with anorectal symptoms postpartum, or remote from vaginal delivery without a clinical diagnosis of OASI should be referred for investigations and management by an experienced provider *(conditional, moderate).*
6. In centres that do not have access to endoanal ultrasound, two-dimensional or three-dimensional transperineal ultrasound can be utilized as a screening tool for structural assessment of anal sphincter complex after primary repair. If a residual anal sphincter defect is identified, women should be referred to a centre with endoanal ultrasound for confirmation of diagnosis. Clinicians should avoid the use of single digital rectal examination alone without imaging to diagnose residual anal sphincter defects *(strong, moderate).*
7. In centres that do not have access to anorectal manometry, clinicians should utilize single digital rectal examination together with endoanal or transperineal ultrasound (2D or 3D) for functional assessment of the anal sphincter complex with the knowledge that no validation studies have been performed *(conditional, low).*
8. Obstetrical care providers should refer all postpartum women with clinical diagnosis of obstetric anal sphincter injury for pelvic health physiotherapy, with adaptation to available local or virtual resources where access is limited, with care commencing as early as between 2 weeks and 6 weeks postpartum *(strong, high)*
9. Obstetrical care providers should counsel all women with history of obstetric anal sphincter injury regarding subsequent mode of delivery using a collaborative approach and this discussion as well as the preferred mode of delivery should be documented *(strong, high).*
10. Obstetrical care providers should consider selective, rather than routine use of mediolateral episiotomy at subsequent delivery when clinically indicated *(strong, moderate).*
11. For asymptomatic women without a residual anal sphincter defect on postpartum endoanal, transperineal ultrasound and normal anorectal manometry, clinicians do not need repeat investigations in subsequent pregnancy and can offer a vaginal delivery *(conditional, moderate).*
12. Obstetrical providers should use endoanal ultrasound for structural assessment and anorectal manometry for functional assessment of the anal sphincter complex. When these are unavailable, 2D or 3D transperineal ultrasound and/or a digital rectal examination may be used as alternatives. Both structural integrity

and function should be assessed to guide counselling and management (strong, moderate).

13. At centres without access to endoanal ultrasound and anorectal manometry, providers should offer an elective Cesarean section to women with a previous fourth degree perineal laceration who are not planning to have future secondary anal sphincter surgical repair. Providers should offer a vaginal delivery to women with a previous fourth degree perineal laceration and moderate/severe anorectal symptoms who are planning to have future secondary anal sphincter repair *(conditional, moderate).*
14. Obstetrical care providers should recommend an elective Cesarean section for women with previous secondary anal sphincter repair *(strong, moderate).*
15. Obstetrical care providers should consider individualized risk factors for recurrent obstetric anal sphincter injury when considering a threshold for Cesarean section during subsequent delivery *(strong, high).*
16. Obstetrical care providers should document discussion and patient's choice regarding preferred subsequent mode of following OASI *(strong, high).*

INTRODUCTION

Obstetric anal sphincter injuries (OASIs) are severe perineal lacerations that involve partial or complete disruption of the anal sphincter complex and can extend into the anal mucosa.[1] OASIs are associated with significant short-term and long-term sequelae and can have a profound psychological, emotional, economic, and social implications for women, families, and the healthcare system.[2] Long-term morbidity may develop years to decades after delivery and can significantly impact quality of life.[3] Timely and expert care are essential to improve outcomes.

The Society of Obstetricians and Gynecologists of Canada (SOGC)'s Guideline No. 457: Obstetrical Anal Sphincter Injuries (OASIS) Part I: Prevention, Recognition, and Immediate Management[4] presents the importance of prevention, accurate clinical diagnosis, and adequate primary repair of OASIs. The purpose of this guideline (Part 2) is to describe the postpartum care and to provide recommendations regarding long-term management for women with OASIs.

SUMMARY STATEMENT 1

ROLE OF A DEDICATED CLINIC

Considering potential sequelae of OASIs, postpartum women with clinical diagnosis of OASI and women with subsequent pregnancy post-OASI should optimally be followed up by a clinician with experience treating women with OASIs in a dedicated clinic.[5,6] If a referral to a dedicated clinic is not feasible, women with OASIs should be followed up by an obstetrician and referred for appropriate investigations and health professionals as indicated.

It is important to note that centres that do not have dedicated clinics may also have access to appropriate specialists and investigations. Although several dedicated clinics have been successfully established in Canada, specialized clinics are still underdeveloped and many women, especially in rural and remote communities, lack access to specialized care.[7-9] Future creation and development of dedicated multidisciplinary clinics are essential to facilitate specialized care and long-term management for women with OASIs nationally.[7,9] A dedicated multidisciplinary team allows for consistency of counseling and

ABBREVIATIONS

3D	Three-dimensional
2D-TPUS	Two-dimensional transperineal ultrasound
3D-TPUS	Three-dimensional transperineal ultrasound
ARM	Anorectal manometry
BMI	Body mass index
CSPM	Canadian Society for Pelvic Medicine
DRE	Digital rectal examination
DRESS	Digital rectal examination scoring system
EAS	External anal sphincter
EAUS	Endoanal ultrasound
EPDS	Edinburgh Postnatal Depression Scale
FGSIS	Female Genital Self-Image Scale
FIQOL	Fecal Incontinence Quality of Life
FSFI	Female Sexual Function Index
GRADE	Grading of Recommendations Assessment, Development and Evaluation
IAS	Internal anal sphincter
ICS	International Continence Society
IUGA	International Urogynecological Association
LANSS	Leeds Assessment of Neuropathic Symptoms and Signs
MLE	Mediolateral episiotomy
iMSP	Incremental maximum squeeze pressure
MRI	Magnetic resonance imaging
MRP	Maximum resting pressure
MSP	Maximum squeeze pressure
OASI	Obstetric anal sphincter injury
OASIs	Obstetric anal sphincter injuries
OR	Odds radio
PAIR	Personal Assessment of Intimacy in Relationships
PFDI-20	Pelvic Floor Distress Inventory-20
PFIQ-7	Pelvic Floor Impact Questionnaire-short form 7
PFMT	Pelvic floor muscle training
PSAS-RSF	Postpartum Specific Anxiety Scale Short-Form
RCT	Randomized controlled trial
RCOG	Royal College of Obstetricians and Gynaecologists
rOASI	Recurrent obstetric anal sphincter injury
SMIS	St. Mark's Incontinence Score
SNM	Sacral neuromodulation
SOGC	Society of Obstetricians and Gynaecologists of Canada
TVIC	Trauma and Violence Informed Care
UK	United Kingdom
VAS	Visual Analogue Scale
VBAC	Vaginal delivery after Cesarean section

optimally consists of obstetrics, urogynecology, pelvic health physiotherapy, urology, nursing, a nurse continence advisor, nurse continence advisor, colorectal surgery, psychology, psychiatry, sex therapy, social work, lactation consulting, pharmacy, and dietetics.[6,7,9–11]

Ensuring fair access to specialized services is critical, and no woman should be disadvantaged by financial constraints or geographic location when seeking the care necessary for recovery, long-term well-being, and making informed choices about future childbirth.

It is important for care to focus on the following:

1. Patient debriefing and discussion regarding delivery complicated by OASI.
2. Assessment of postpartum recovery, including presence of anorectal and urinary symptoms, wound infection, pelvic organ prolapse, sexual function, pain, emotional and psychological well-being, and impact on quality of life.
3. Provision of consistent multidisciplinary education and support for both women and individual(s) supporting birthing parents.
4. Early identification and management of short-term and long-term complications associated with OASIs including appropriate expertise for surgical intervention (such as secondary anal sphincter repair, sacral neuromodulation, and rectovaginal fistula repair) if indicated.
5. Provision of management strategies to decrease the risk of recurrence of OASIs with subsequent delivery.
6. Counselling and empowering women to make an informed decision regarding subsequent mode of delivery.[5,7,10,12,13]
7. Counselling regarding prevention of pelvic floor disorders in the future.

Women may report delivery complicated by OASI to be a traumatic experience and it is important to provide care grounded in Trauma- and Violence-Informed Care (TVIC) principles. This includes creating emotionally safe clinical encounters, acknowledging the potential impact of prior trauma or abuse, and adapting clinical practices (including physical examinations and counselling) to minimize distress and promote a sense of safety and control.[14,15]

Women with OASIs may experience psychological sequelae including anxiety, depression, altered body image, shame, difficulty coping, and social isolation.[15–17] These women may be reluctant to seek care and these psychological consequences can impact maternal-infant relationship, infant development, and relationship with partners and family.[15,16,18] Women's partners may also experience anxiety and social isolation, highlighting the importance of supporting both women and their families.[19]

SUMMARY STATEMENTS 2 and 3 and RECOMMENDATIONS 1 and 2

ASSESSMENT POSTPARTUM AND DURING SUBSEQUENT PREGNANCY

Assessment for women with clinical diagnosis of OASIs consists of history, physical examination, and investigations. The timing of postpartum assessment varies among dedicated clinics, with some assessing women at specific time intervals and others based on evolution of symptoms.[9] Considering the rate of early wound complications, it is reasonable to initiate follow-up within 1-2 weeks post-partum.[20] Screening for complications associated with OASI should occur during the 6-week postpartum visit and at subsequent visits as needed.[5]

Women with subsequent pregnancy post-OASI should be counselled regarding subsequent mode of delivery.[5] There is no evidence regarding the optimal timing of assessment during subsequent pregnancy. However, it is important to consider the risk of spontaneous abortion, possibility of termination of pregnancy, timeline for specialist consultation and completion of investigations, time required for a woman to consider her options and make an informed decision regarding subsequent mode of delivery, and planning logistics surrounding arrangement of Cesarean section if this is the preferred mode of delivery. Considering these factors, the expert opinion is for optimal timing to be in the third trimester (after 28 weeks). However, this timeline may be tailored towards individual's unique circumstances.

History and Physical Examination

Components of assessment for postpartum women and women with subsequent pregnancy post-OASI are presented in Appendix B. Some practitioners may find it helpful to incorporate validated questionnaires into assessment. St. Mark's Incontinence Score (SMIS), presented in Appendix C, is used for assessment of anorectal symptoms in the past 4 weeks.

Single digital rectal examination (DRE) is performed for functional assessment of anal sphincter complex.

Specifically, the Digital Rectal Examination Scoring System (DRESS) presented in Table 1 can be used to report a) resting and b) squeeze pressures.

RECOMMENDATION 3

INVESTIGATIONS

The purpose of anorectal investigations for women with OASIs is the following:

1. To confirm accuracy of clinical diagnosis
2. To assess structure and function of anal sphincter complex
3. To guide management of anorectal symptoms including surgical planning
4. To create individualized recommendations regarding subsequent mode of delivery
5. To stratify risk of developing anorectal symptoms in the future

For women with obstetric anal sphincter injury, it is important to assess both integrity and function of the anal sphincter complex using endoanal ultrasound (EAUS) and anorectal manometry (ARM).[21] In centres that do not have access to these resources, alternative available investigations should be considered.

Table 1. The Digital Rectal Examination Scoring System (DRESS)[63]

Resting Score	
0	No discernable tone at rest, an open or patulous anal canal
1	Very low tone
2	Mildly decreased tone
3	Normal
4	Elevated tone, snug
5	Very high tone, a tight anal canal, difficult to insert a finger
Squeeze Score	
0	No discernable increase in tone with squeezing effort
1	Slight increase
2	Fair increase but below normal
3	Normal
4	Strong squeeze
5	Very strong squeeze, to the point of being painful to the examiner

DRESS: digital rectal examination scoring system; ARM: anorectal manometry.

SUMMARY STATEMENT 4 and RECOMMENDATION 4

Endoanal Ultrasound (EAUS)

EAUS is the gold standard for structural assessment of the anal sphincter complex.[22] It is typically performed after 6-weeks postpartum as performing EAUS in the early puerperium period has poor correlation with long-term anal incontinence.[23,24] The probe is placed into the anal canal and 360° images are obtained at four levels: 1) puborectalis muscle, 2) deep external anal sphincter (EAS) (proximal) and internal anal sphincter (IAS), 3) superficial EAS (mid) and IAS, 4) subcutaneous EAS (distal) (*Figure 1*).

Integrity of the Anal Sphincter Complex

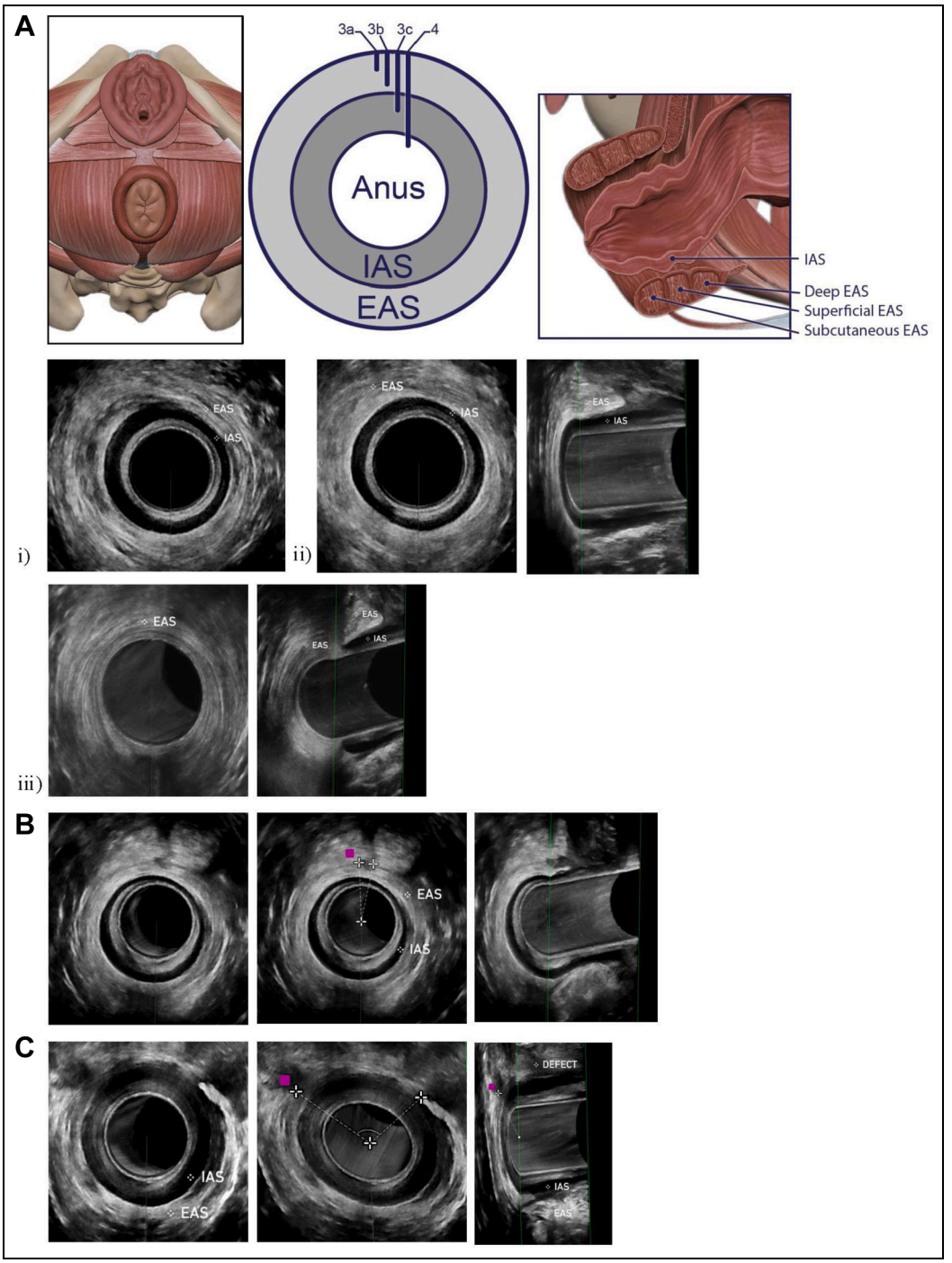
The following definitions depicted in Figure 1 are utilized to describe the integrity of anal sphincter complex using EAUS:

1. **Intact:** normal continuity of anal sphincter complex (no evidence of previous OASIs).[10,25]
2. **Scar:** partial or full thickness break in the normal continuity of the anal sphincter complex less than 1 hour (<30°), which is expected at the site of primary OASI repair.[26]
3. **Defect:** partial or full thickness break in the normal continuity of the anal sphincter complex (EAS and/or IAS) ≥1 hour (≥30°) in width at ≥2 of the 3 levels. The size of a defect is described as hours on a clock face or measured in degrees (12 hours equal to 360° with each hour equivalent to 30°).[27]

Under-classification of OASIs

In a 2023 retrospective observational study of 615 women referred to a tertiary care clinic with clinical diagnosis of 3A and 3B degree perineal lacerations, 1 in 11 women had evidence of damage to IAS on EAUS indicating presence of ≥3C degree perineal laceration.[28] Similarly, 11.36% of women with clinical diagnosis of 3A or 3B perineal laceration had evidence of greater defect on EAUS than clinical diagnosis.[29] Women with missed OASIs experience significantly worse anorectal symptoms, which may be due to incomplete repair, residual anal sphincter defects, and more severe symptoms with greater tears.[29,30]

Figure 1. Endoanal Ultrasound Findings.



A) Normal anal sphincter complex i) deep; ii) superficial; iii) subcutaneous levels. EAS appears hyperechoic (white), IAS appears hypoechoic (black). IAS is the continuation of circular muscle of the rectum that terminates 6-8mm above the anal margin.[131] B) Partial thickness scar measuring 14.2 degrees. C) Full thickness, full length defect in EAS measuring 99.3 degrees. Intact IAS. EAUS images obtained by Dr. Maria Giroux, MD FRCSC (Regina, SK) at the Centre for Obstetric Pelvic Health & Reconstructive Surgery (Centre for OASIS) and used with patients' permission. 3D pelvic model was created by a medical artist, Ms. Aimee Hutchinson, BA MSc (Belfast, Northern Ireland), with conceptual design by Dr. Maria Giroux, MD FRCSC (Regina, SK). 3D pelvic model used with permission. EAUS: endoanal ultrasound, EAS: external anal sphincter; IAS: internal anal sphincter; 3D: three-dimensional

Missed OASIs

While women with under-classified OASIs have an attempt at primary anal sphincter repair, women with missed OASIs may have no attempt to repair the anal sphincter, which can have devastating consequences.[29,30] Missed OASIs have been reported in 11.5-14% of vaginal deliveries and 9.3% of women who received sutures for first or second degree perineal lacerations.[31-33] At 2 months postpartum, 71.5% of women with missed OASIs report moderate anal incontinence.[31] A 2017 retrospective study of 32 patients with missed OASIs matched two to one with 62 women with OASIs who had primary anal sphincter repair revealed that women with missed OASIs experience more severe anorectal and urinary symptoms at 9.31+/-6.79 months postpartum.[30] Therefore, women without clinical diagnosis of OASI who experience postpartum anorectal symptoms require a referral for investigations and management by an experienced provider. It is also important to note that women with missed OASIs may be asymptomatic.[32] These women are at increased risk of developing anal incontinence after subsequent delivery and later in life.[32]

RECOMMENDATION 5

Overdiagnosis of OASIs

Women with overdiagnosis have a clinical diagnosis of OASI, but normal integrity of anal sphincter complex on EAUS. Overdiagnosis has been reported in 7-37% in literature.[8,34,35] A Canadian retrospective study of 330 women found the rate of overdiagnosis of OASIs to be 36.8%.[36] In this scenario, women can be reassured that they do not have diagnosis of OASI and an elective Caesarean section for the sole indication of OASI is unnecessary.[36]

In summary, the possibility of incorrect diagnosis of degree of perineal trauma highlights the importance of provider training, accurate clinical diagnosis and adequate primary repair of OASIs, clinical practice audits, and access to appropriate investigations and specialists.[29]

Residual Anal Sphincter Defect

Residual anal sphincter defects have been reported in 34-91% of women after primary OASI repair.[21] Theoretically, persistent anal sphincter defect may be due to inadequate primary repair and/or wound infection/dehiscence.[36] Presence of residual anal sphincter defect is associated with development of anorectal symptoms.[37] In a large systematic review of 16,110 women with OASIs, residual anal sphincter defect was present in 55% of women and 38% of these women developed anal incontinence.[37] Combined EAS and IAS defects have the highest risk of anorectal symptoms.[38] A 2023 Canadian study found a weak positive correlation between the size of residual anal sphincter defect and anorectal symptoms.[36] It is also possible for women with a residual anal sphincter defect to be asymptomatic. In a retrospective observational study of 140 women, 70% of women with residual external anal sphincter defects were asymptomatic at 2 months postpartum.[39] Nonetheless, these women are at risk of developing anorectal symptoms in the future.[40] Therefore, EAUS is a crucial component for assessment of integrity of the anal sphincter complex.[36]

Centres without EAUS

For assessment of structure of anal sphincter complex, DRE alone has limited diagnostic accuracy, with reported sensitivity of 12-82% and specificity of 32-55% for diagnosis of residual external anal sphincter defects observed on EAUS.[41−43] Therefore, EAUS remains the gold standard for structural assessment of anal sphincter complex.[22] The use of DRE alone to diagnose residual external anal sphincter defects after primary OASI repair should be avoided.[22] Since EAUS is not widely available, two-dimensional or three-dimensional transperineal ultrasound (2D-TPUS and 3D-TPUS) can be utilized as a screening tool with referral to a centre with EAUS when indicated.[44]

RECOMMENDATION 6

3D-Transperineal Ultrasound (3D-TPUS)

The definition of a residual anal sphincter defect is ≥1 hour (≥30°) in width partial or full thickness in ≥3 out of 7 slices for EAS and ≥2 out of 5 slices for IAS, with sensitivity of 70% and specificity of 69% for EAS defect.[45] Nonetheless, this definition needs reappraisal because there is poor correlation between 3D-TPUS and EAUS measurements with standard error of measurement of +/-16.5° for EAS defect and +/-26.4° for IAS defect.[46] Therefore, using the same cut-off angle of 30° for both 3D-TPUS and EAUS could result in incorrect diagnosis of a significant defect in 9-36% of women for EAS and 4-15% of women for IAS respectively.[46] Therefore, future research is required to establish the optimal cut-off angle to define a significant defect using 3D-TPUS.[46]

Since 3D-TPUS has a high negative value for detection of residual anal sphincter defects (85% for EAS and 93% for IAS), women without a residual anal sphincter defect 3D-

TPUS do not require a referral for EAUS.[45] However, 3D-TPUS has a low positive predictive value for detection of residual anal sphincter defect (51% for EAS and 37% for IAS).[45] Therefore, EAUS remains the imaging modality of choice for diagnosis of residual anal sphincter defects and women with a defect identified on 3D-TPUS should be referred to a centre with EAUS for confirmation of diagnosis.[45,47]

2D- Transperineal Ultrasound (2D-TPUS)

In centres that do not have access to EAUS and 3D-TPUS, two-dimensional transperineal ultrasound (2D-TPUS), also known as introital ultrasound, can be utilized as a screening tool for presence of residual external anal sphincter defects in women with clinical diagnosis of OASI.[48,49] It accessible, less expensive comparing to EAUS, reproducible, and non-invasive tool for visualizing the anal sphincter complex.[48,49] The definition for a residual anal sphincter defect is the same for both 2D-TPUS and 3D-TPUS.[45] Similarly to 3D-TPUS, 2D-TPUS also has a high negative value for detection of residual anal sphincter defects (86% for EAS and 93% for IAS). Therefore, women without a residual anal sphincter defect on 2D-TPUS do not require a referral for EAUS.[45] 2D-TPUS also has a low positive predictive value for detection of residual anal sphincter defect (50% for EAS and 63% for IAS). Therefore, women with anal sphincter defect identified on 2D-TPUS should be referred to a centre with EAUS for confirmation of diagnosis.[45]

Magnetic Resonance Imaging (MRI)

There is limited literature regarding the use of MRI for assessment of residual external anal sphincter defects as an alternative to EAUS. A small prospective study of 40 women revealed moderate interrater reliability between EAUS and 1.5T external phased-array MRI.[50] Another small prospective study of 24 women revealed comparable results between EAUS and 3T external phased-array MRI.[51] Future larger studies are required to determine whether MRI could be an alternative diagnostic modality for centres that do not have access to EAUS.

SUMMARY STATEMENT 5

Anorectal Manometry (ARM)

ARM provides an objective measurement of the function of anal sphincter complex.[52] Normal ARM parameters depend on the equipment utilized.[53] The following parameters are important for women with OASIs:

- **Maximum resting pressure (MRP) (normal 60-160cm H2O for water-perfused high resolution manometry and 40-103mm Hg for THD® Anopress):** maximum pressure present in the anal canal at rest approximately (50-85% is due to IAS, 25-30% is due to continuous tonic contraction of the EAS, 15% is due to anal cushions).[9,22,53]
- **Maximum squeeze pressure (MSP) (normal 50-180cm H2O for water-perfused high resolution manometry and 35-140mm Hg for THD® Anopress):** maximum pressure present in the anal canal during squeeze and cough maneuvers (voluntary contraction of EAS).[22,53]
- **Incremental maximum squeeze pressure (iMSP) (normal ≥20mm Hg) = maximal squeeze pressure − maximum resting pressure:** increase in pressure in the anal canal above the resting pressure during voluntary contraction of EAS (reflects function of EAS).[40]

Abnormal anorectal sphincter function may be present after both vaginal delivery and Cesarean section.[54,55] In a prospective cohort study of 283 nulliparous women, anal pressures decreased between third trimester and 3 months after vaginal delivery in women with and without evidence of OASI.[56] Although women with anorectal symptoms and residual anal sphincter defects post-OASI are more likely to have a compromised anal sphincter function,[9,21,52,56] a large retrospective cohort study of 13,548 women with OASIs revealed that 30.6% of asymptomatic women without residual anal sphincter defect on EAUS also have abnormal ARM findings.[21] Anorectal symptoms are multifactorial and abnormal anorectal function may be attributed to injury to the anal sphincter complex, pudendal neuropathy, connective tissue damage, and weakness in the pelvic floor musculature.[54,56,57]

Furthermore, anal sphincter function may improve with time.[56,58] In a small prospective cohort study of 100 women initially assessed with ARM in third trimester of pregnancy, anal pressures decreased at 24 hours and 6 weeks postpartum and improved by 6 months postpartum.[58] Similarly, anal squeeze pressures improved by 6 months postpartum.[59] Therefore, an expert opinion is for women with abnormal ARM findings postpartum to have a repeat ARM in subsequent pregnancy because compromised anal sphincter function can influence counselling regarding subsequent mode of delivery.[21,60]

Centres without ARM

For assessment of anal sphincter function, DRE can be utilized together with EAUS, 2D-TPUS, or 3D-TPUS in centres that do not have access to ARM with the knowledge that no validation studies have been performed.[42,61] DRE is minimally invasive, cost-effective, quick, and easy to perform.[52] DRE is used to assess the resting anal tone, voluntary squeeze of both anal sphincter complex and levator ani muscles, sustained anal sphincter squeeze over 5-10 seconds (normal endurance squeeze pressure ≥5 sec), and involuntary contraction on cough or Valsalva.[22]

In patients with fecal incontinence, the agreement between DRE and ARM has been reported to be poor for anal resting pressure and moderate for anal squeeze pressure.[62] Nonetheless, there is a strong positive correlation between the use of DRESS scoring system for DRE and conventional anorectal manometry for anal resting and squeeze pressures.[63] The agreement between DRESS score and ARM findings varies by provider experience, with more experienced providers showing greater accuracy of estimating anal sphincter function.[52] For more objective assessment of the anal sphincter function, anorectal manometry remains the modality of choice.[52] If ARM is not immediately available, it can be performed during subsequent pregnancy or prior to surgical management of fecal incontinence.

RECOMMENDATION 7

ROLE OF VAGINAL ESTROGEN

Women may experience vulvovaginal symptoms of hypoestrogenism during the postpartum period.[64] This relative state of hypoestrogenism is induced through postpartum anovulation and can be exacerbated during lactation. To date, the only published double blind randomized controlled trial (RCT) evaluating both the efficacy and safety of postpartum vaginal estrogen enrolled 59 women with a 2nd degree laceration or greater (7 women with OASI).[65] These women were randomized to 1g vaginal estrogen or placebo to be used intravaginally twice weekly for 12 weeks.[65] There were no adverse events reported in the vaginal estradiol arm, and no differences in infant-feeding patterns between groups at 12 weeks.[65] There was an improvement in the primary outcome measure, vulvar assessment scale (VuAS), at 12 weeks in the vaginal estradiol arm, but this was neither statistically or clinically significant due to small absolute reduction in score.[65] More women in the estradiol arm reported feeling "very satisfied" and their perineum to feel "very much better" than placebo, although this study was not powered to assess statistical differences for these subjective assessments.[65] Limitations of this study which impact its generalizability include its small sample size, low rates of exclusive breastfeeding (<10%), and omission of clear indicators as to when the use of vaginal estrogen was initiated. The latter is important to know when evaluating its potential impact on breastmilk supply and clinical improvement in vulvovaginal symptoms.[65] Future research is required in the role of vaginal estrogen in postpartum women.

SUMMARY STATEMENT 6

ROLE OF PELVIC HEALTH PHYSIOTHERAPY

Regarding post-partum pelvic health physiotherapy, several trials confer overall benefit, particularly for individualized pelvic floor muscle training (PFMT).[66] Wu et al. published a systematic review and meta-analysis of 15 RCTs, examining the impact of PFMT versus "watchful waiting" on pelvic floor disorders including urinary incontinence, anal incontinence, pelvic organ prolapse, and sexual dysfunction.[66] Furthermore, the trials included were not limited to women who had sustained OASIs. Nonetheless, a subgroup analysis favoured PFMT over expectant management for improvement of anorectal symptoms in women with OASIs.[66,67] OASI is an independent risk factor for persistent stress urinary incontinence and anal incontinence.[68-71] Individualized physiotherapist supervised PFMT is an effective treatment modality for women with stress urinary incontinence and anal incontinence.[72] Furthermore, women with OASIs encounter a variety of pelvic floor concerns in the first 6 months post-partum suggesting a justified benefit of individualized rehabilitation.[73] DeLancey and colleagues (2024) recently concluded that care provision for women who have experienced difficult deliveries can be enhanced with early recognition, pelvic health physiotherapy, and attention to recovery.[74]

Oakley et al. randomized 50 women with OASIs to standard of care (no exercise instruction) and an intervention comprised of pelvic health physiotherapy including biofeedback facilitated PFMT, deep core exercise prescription, and manual therapy.[75] The intervention was initiated at 6 weeks postpartum. At 12 weeks postpartum, there were no differences in Fecal Incontinence Quality of Life (FIQOL) domain scores and ARM measurements. Participants in both groups demonstrated improvement in domains of coping and depression. Some limitations of this study

included imbalance of sample characteristics between groups, notably a higher proportion of fourth degree perineal lacerations in the intervention group. In addition, the baseline severity of symptoms was low as per FIQOL and participants reported normal anal continence on their baseline questionnaires. Furthermore, follow up was limited to 12 weeks, which denotes the fourth trimester and a critical healing period, limiting meaningful insight gained from the intervention studied. Additionally, the intervention consisted of only 4 care sessions spanning 6 weeks,[75] when the current global recommendations for efficacy related to supervised PFMT to improve pelvic floor dysfunction is 12 weeks, with sessions occurring 3 to 4 times a week.[76]

A 2021 RCT by Von Bargen et al also evaluated the impact of pelvic health physiotherapy on pelvic floor symptoms in the early postpartum period in women with OASIs.[77] This RCT randomized 50 women to standard care alone versus together with pelvic health physiotherapy starting at 2 weeks postpartum. Pelvic health physiotherapy was individualized and multidimensional, including patient education, manual therapy, therapeutic exercise, neuromuscular re-education, and therapeutic activities and modalities. Comparing to 2 weeks postpartum, women in both groups experienced a reduction in pelvic floor, urinary, and anorectal symptoms compared at 12 weeks postpartum. Pelvic health physiotherapy group experienced a significant improvement in pelvic floor symptoms and bother, as quantified by a larger reduction in their Pelvic Floor Distress Inventory (PFDI-20) scores compared with the standard care group.[77]

For women suffering with anal incontinence after OASI, pelvic health physiotherapy has been demonstrated to be an effective treatment modality.[67,78] Mahony et al. randomized 60 women with fecal incontinence at 12 weeks postpartum to two different types of biofeedback applications as part of pelvic floor exercise programs. Ninety six percent of these women had residual anal sphincter defects of the EAS on ultrasound. Both groups undergoing pelvic health physiotherapy programs reported significant improvements in self-reported anal continence scores and ARM findings.[78] A 2017 RCT recruited women at one year postpartum with anal incontinence with and without OASIs.[79] Participants were randomized to a control group (written information alone) or treatment group (6 months of individual physiotherapist-guided PFMT over the course of 4-6 appointments). The PFMT group experienced a significant reduction in St. Mark's Incontinence Scores (SMIS) from baseline to post-intervention compared with controls, as well as a significant reduction in fecal urgency and flatal incontinence.[79] Since 30% of women with OASIs have anal incontinence, PFMT can improve severity of anorectal symptoms.[80]

Recent qualitative data also supports the benefits of pelvic health physiotherapy. Johannesson and colleagues (2022) conducted in-depth interviews with 14 women who sustained OASI and reported that women felt "empowered" and "in good hands" through the care they received from pelvic health physiotherapists.[67]

Prevention of Perineal Trauma

From a prevention perspective, the use of antepartum PFMT has not been shown to reduce perineal trauma.[81] Specific to OASI, Zhang and colleagues (2024) performed a meta-analysis of 30 studies (N=6691). Their findings highlight the importance of incorporating PFMT into antenatal care and training programs to improve maternal well-being and overall childbirth outcomes. An effective preventive action of PFMT was found for urinary incontinence and OASIs. These findings support the role of antenatal PFMT as a preventive strategy to improve maternal childbirth outcomes and maternal pelvic floor health.[82]

Timing and Mode of Delivery of Pelvic Health Physiotherapy

In considering general timeline for tissue healing while also acknowledging PFMT as a mode of accelerating muscle recovery, commencing pelvic health physiotherapy in the early post-partum period is recommended. Evidence supports that pelvic health physiotherapy can be commenced as early as between 2 weeks and 6 weeks post-partum for women with OASIs.[77,83]

In-person care remains the gold standard for physiotherapy care.[84,85] However, virtual care and mobile health applications designed based on appropriate evidence-based principles have been found to be effective and appropriate when in-person care is not available.[85] Such recommendations are for general pelvic floor dysfunction and not specific to women with OASIs.

It is also important to note that, if access is limited by local (including telehealth) resources, alternate strengthening therapies such as yoga or pilates[86] as well as online resources could be considered.

SUMMARY STATEMENT 7 and RECOMMENDATION 8

SUBSEQUENT MODE OF DELIVERY

In women with a history of OASIs, 60-75% have a subsequent pregnancy,[14,87] and 49% report experiencing anxiety regarding subsequent pregnancy.[15]

Counselling Regarding Subsequent mode of delivery

All women with a history of OASI should receive counselling to guide shared decision-making regarding subsequent mode of delivery using a collaborative approach. This discussion and patient's preferred mode of delivery should be documented.[5]

During discussion, it is important to consider the following factors:

1. Current physical and emotional sequelae post-OASI and their effect on quality of life
2. Findings on physical examination and investigations
3. Desire and plans for future childbearing
4. Risks and benefits associated with vaginal delivery and Caesarean section
5. Risk of recurrent OASI (rOASI), including individualized risk factors and protective factors for recurrence
6. Risk of developing or worsening of anorectal symptoms with each mode of delivery
7. History of previous pelvic floor surgery and/or sacral neuromodulation (SNM)
8. Patient's and family's preferences regarding subsequent mode of delivery

Women with OASIs report two main concerns about subsequent delivery: the risk of recurrence of OASI and the risk of development or deterioration of anorectal symptoms after subsequent delivery.[27] Seventy five percent[27] to 95%[40] of women agree to deliver according to recommendations made by their provider based on EAUS and ARM findings.[27] Shared decision-making is paramount and 34.9% of women reported that counselling they received influenced their decision regarding subsequent mode of delivery.[2]

SUMMARY STATEMENT 8 and RECOMMENDATION 9

Risk of Anorectal Symptoms after Subsequent Delivery

Evidence regarding anorectal symptoms is conflicting with some studies reporting de novo or deterioration of symptoms, while other studies report no difference in symptoms after subsequent delivery.[14,88,89] Even mild anorectal symptoms can significantly impair quality of life.[90] A systematic review and meta-analysis of 27 studies reported no impact of subsequent delivery on anorectal symptoms.[88] There was no difference in postpartum anorectal symptoms between vaginal delivery and Cesarean section.[88] This evidence, however, is limited by sample size, quality, and heterogeneity of studies.

Only one RCT reported on the outcomes of elective Cesarean section versus vaginal delivery in 222 asymptomatic women with anal sphincter lesions diagnosed on EAUS. It revealed no difference in anal incontinence between two groups at 6-8 weeks and 6 months postpartum.[91] However, findings from this trial have limited generalizability due to: 1) issues with the definition of a significant anal sphincter defect on EAUS 2) only 14.7% of women randomized had a history of a third degree perineal laceration and all women with a fourth degree perineal laceration were excluded 3) the majority of women (91.0%) had forceps assisted vaginal delivery at their first delivery and women who had vacuum assisted vaginal delivery were excluded 4) ARM was not performed to assess for functional compromise of the anorectal sphincter complex 5) the timeframe was relatively short for development of anorectal symptoms 6) there was no subgroup analysis performed to guide recommendations based on the size of residual anal sphincter defect noted on EAUS.[91,92]

A large systematic review and meta-analysis of 14 studies (977 women) concluded that due to sample size, quality and heterogeneity of currently available evidence, the optimal delivery route for women with OASIs remains unknown.[88] Similarly, a 2024 systematic review and meta-analysis of 9 studies reported that due to low quality of currently available evidence, it is not possible to determine whether elective Cesarean section at subsequent delivery is protective against anal incontinence in women with previous OASIs.[87] Further research is required in this area.

SUMMARY STATEMENT 9

Long-Term Anorectal Symptoms After Subsequent Delivery

Long-term anal incontinence has been reported after subsequent delivery in 12-54% of women with OASI, including 41.0% after third degree, and 58.8% after fourth degree perineal laceration.[93] Presence of transient or permanent anal incontinence after index delivery complicated by OASI correlates with presence of long-term anal incontinence regardless of presence or subsequent mode of delivery.[87]

Prevalence of anorectal symptoms is the highest in the puerperal period, decreases as the function of pelvic floor recovers postpartum, and then becomes more prevalent as anal sphincter function deteriorates with age.[94,95] Long-term sequelae can develop years to decades after index OASI and can significantly impair quality of life.[3] No RCTs have specifically studied the impact of elective Cesarean section versus vaginal delivery on long-term anorectal symptoms in women with OASIs.[87]

Anorectal symptoms can also be present in women without OASI and women after adequate primary repair of OASI.[96, 97]Anorectal symptoms are multifactorial in nature and may be present due to residual anal sphincter defect, weakness in the pelvic floor musculature, and pudendal neuropathy.[96–98] Since contraction of the pelvic floor musculature is associated with increased pressure in the proximal anal canal, greater pelvic floor muscle strength is associated with less severe anorectal symptoms.[99,100] Furthermore, 10% of asymptomatic women with persistent anal sphincter defects at 9 weeks postpartum developed de novo anal incontinence at 3 years postpartum.[101] Women who are initially asymptomatic may also develop anorectal symptoms later in life, especially after menopause.[95,102] Estrogen receptors have been identified in the external anal sphincter, smooth muscle of the internal anal sphincter, and connective tissue of the anal canal.[103–106] As pelvic floor muscle function deteriorates with age, anorectal symptoms may develop or become more severe.[95] Prevalence of fecal incontinence increases after the age of 52 in women with previous OASI.[102] At the age of 60, fecal incontinence was reported in 19.8%, 36.8%, and 48.8% for women with no previous OASI, one OASI, and two OASIs respectively.[102]

Future research is required to determine the long-term effect of a subsequent pregnancy and delivery on pelvic floor function and quality of life.[87] Future research is also needed to compare prevalence and severity of anorectal symptoms at 3 time points: postpartum after OASI, postpartum after subsequent delivery, and long-term after subsequent delivery.[87]

SUMMARY STATEMENT 8

Risk of Recurrent OASI (rOASI)

Women with a history of OASI have an increased risk of rOASI at subsequent delivery compared to multiparous women without previous OASI.[107] The published rates of rOASI range from 2.0% to 13.4%, whereas the risk of OASI in women without prior OASIs is 1.5%.[108] A 2014 Canadian study of 1,923 subsequent deliveries post-OASI in Ontario reported the risk of recurrence to be 5.3%.[109] Based on this evidence, women with a previous OASI can be counselled that most will not have rOASI after subsequent delivery. The most common laceration after a previous OASI is a second degree perineal laceration, reported in 59.4% of women.[89] Women with a history of OASI who do not have a recurrence during subsequent vaginal delivery continue to have an elevated risk of rOASIs (3.1%) during the following vaginal delivery.[108] It is important to discuss risk factors presented in Table 2 for rOASI during subsequent pregnancy during counselling regarding subsequent mode of delivery. Most of the risk factors for rOASI are not modifiable (ex. maternal age) or their presence may become apparent later in labour (ex. need for augmentation, operative vaginal delivery, presence of shoulder dystocia). It is important to note that 0.3% of women with OASI sustain a traumatic cloacal defect, which may be due to wound breakdown of a fourth-degree perineal laceration.[110] In these women, it is important to be cognizant of the possibility of tissue breakdown with subsequent vaginal delivery.[111]

Regarding protective factors for recurrence, a systematic review and meta-analysis identified 11 studies that examined the impact of episiotomy at the time of subsequent delivery on the risk of rOASI.[112] Data pooling did not show any association between episiotomy at subsequent delivery and rOASI, suggesting that episiotomy is neither a risk factor, nor protective against recurrence. It is important to recognize a limitation of the primary data used for this meta-analysis, as many of the included studies did not specify or differentiate the angle of episiotomy employed at delivery (midline versus mediolateral episiotomy [MLE]).[112] More recent studies, which have been specifically focused on MLE and rOASI suggest that MLE at subsequent delivery may confer a protective role in prevention of rOASI. For instance, D'Souza et al. described an 80% reduction in the risk of rOASI at subsequent delivery in women with previous OASI.[89] The authors of this study reported an impressively low number of prophylactic episiotomies required to prevent rOASI (NNT=8 to prevent one rOASI for all modes of vaginal delivery, NNT=10 to prevent 1 rOASI for SVD). Therefore, MLE at the time of subsequent delivery does not increase the risk of rOASI and may be protective against rOASIs.[89,112] Therefore, MLE should be performed when clinically indicated.[112]

Table 2. Risk Factors for Recurrent OASI at Subsequent Delivery

	OR[a]	SMD
Maternal Risk Factors		
Maternal age (years)[89,112,128] Maternal age ≥40 years at subsequent delivery[108]	1.34-1.95	0.31
History of 2 previous OASIs[108]	10.6	
Wound infection at index delivery complicated by OASI[129]	9.97	
Fetal Risk Factors		
Fetal macrosomia (birth weight >4kg) at subsequent delivery[89,108,130]	2.1	
Occiput posterior position at subsequent delivery[108,112] Greater gestational age[112]	1.41-2.85	0.11
Obstetrical Factors Risk Factors for rOASI		
Duration of second stage ≥30 minutes[130]	1.8	
Augmentation with oxytocin[112]	1.48	
Operative vaginal delivery at subsequent delivery[112]	3.46	
Shoulder dystocia at subsequent delivery[108,112,128]	1.98-4.27	

rOASI: recurrent obstetric anal sphincter injury; OASI: obstetric anal sphincter injury, OR: odds ratio; SMD: standard mean difference.
[a]All OR 95% confidence intervals are significant, i.e. do not cross 1.

In summary, further research is required regarding efficacy of intrapartum measures to prevent rOASI. Counselling remains paramount in shared decision-making regarding subsequent mode of delivery and the use of intrapartum measures, such as selective MLE, for prevention of rOASI.[112]

SUMMARY STATEMENT 10 and RECOMMENDATION 10

Management of rOASI

For women selecting vaginal delivery after previous OASI, it is imperative for providers to perform a careful post-delivery examination described in SOGC Guideline No. 457: Obstetrical Anal Sphincter Injuries (OASIS) Part I: Prevention, Recognition, and Immediate Management[4] to assess for rOASI. If rOASI is identified, repair and postpartum care recommendations should follow those outlined in this guideline. [4]

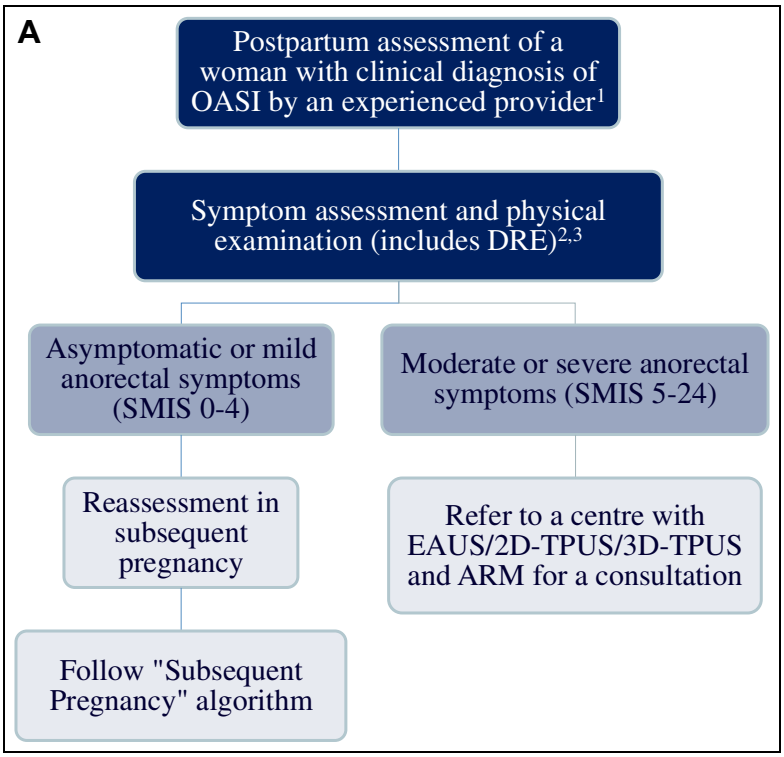
Women who have had two OASIs are at an increased risk of rOASI at the next vaginal delivery (OR 10.6); recurrent OASI increases risk for developing more severe anorectal symptoms as compared to women with one OASI.[102,107] An observational study comparing 6760 women without OASIs, 357 women with one OASI, and 324 women with two OASIs reported an additive effect of one or two OASIs on severity and impact of self-reported anal incontinence in women at two decades after index delivery.[102] The severity of anal incontinence increased for all components (solid stool, liquid stool, and gas) after two OASIs comparing to one OASI.[102] Conversely, these authors did not find significant differences in long-term lower urinary tract symptoms and other pelvic floor disorders at two decades after index delivery between women with no, one, or two prior OASIs.[102]

Algorithms for Counselling

Future research is required to determine the optimal subsequent mode of delivery in women with previous OASI. Recommendations regarding subsequent mode of delivery for centres with and without available investigations are outlined in Figure 2 a, b, c, d. These algorithms were developed based on expert opinion incorporating currently available evidence.[40,44,92] They should be interpreted with the knowledge that future long-term research is required in this area. Individualized counselling is paramount to empower women to make an autonomous decision regarding subsequent mode of delivery.

Asymptomatic women without a residual external anal sphincter defect on EAUS and normal ARM postpartum do not need repeat investigations in subsequent pregnancy and can be offered a vaginal delivery.[92] Normal EAUS is defined as intact anal sphincter complex (overdiagnosis of OASI) or scar in the EAS.[25,27] Abnormal EAUS is defined a residual anal sphincter defect in the EAS.[27] Presence of IAS defect does not impact counselling regarding subsequent mode of delivery.[27] For women with a residual external anal sphincter defect identified using EAUS postpartum, the size of the defect is unlikely to change with subsequent pregnancy and these women do not require repeat EAUS in subsequent pregnancy unless there is uncertainty regarding

Figure 2. Recommendations Regarding Postpartum Management and Subsequent Pregnancy After OASI



A) Recommendations regarding postpartum management for women with OASI for centres without EAUS/2D-TPUS/3D-TPUS and ARM. B) Recommendations regarding management of subsequent pregnancy for women with history of OASI for centres without EAUS/2D-TPUS/3D-TPUS and ARM. C) Recommendations regarding postpartum management for women with OASI for centres with EAUS/2D-TPUS/3D-TPUS and ARM. D) Recommendations regarding management of subsequent pregnancy for women with history of OASI for centres with EAUS/2D-TPUS/3D-TPUS and ARM. Algorithms created by Maria Giroux, MD FRCSC (Regina, SK, Canada) and Abdul Sultan, MBChB, MD, FRCOG (Croydon, Surrey, UK)

[1]Assessment is typically performed at 6-8 weeks postpartum.[5,132] If available, women are referred to a dedicated clinic. The timing of postpartum assessment varies among dedicated clinics.[9] EAUS and ARM are performed at least 6 weeks postpartum.[23,24]

[2]Anorectal symptoms include fecal urgency, fecal incontinence, and flatal incontinence. SMIS is used for assessment of anorectal symptoms.[133] Severity of anorectal symptoms is classified as mild (0-4), moderate (5-8), and severe (9-24).[92]

[3]DRESS score is used for DRE.[63]

[4]During third trimester (after 28 weeks) based on expert opinion. This timeline may be tailored towards individual's unique circumstances.

[5]Discussion and shared decision-making regarding subsequent mode of delivery using a collaborative approach considering the following factors: 1) Current physical and emotional sequelae post-OASI and their effect on quality of life; 2) Findings on physical examination and investigations; 3) Desire and plans for future childbearing; 4) Risks and benefits associated with vaginal delivery and Caesarean section; 5) Risk of rOASI, including individualized risk factors and protective factors for recurrence; 6) Risk of developing or worsening of anorectal symptoms with each mode of delivery; 7) History of previous pelvic floor surgery and/or SNM; 8) Patient's and family's preferences regarding subsequent mode of delivery.

[6]Only 7% of women with a fourth degree perineal laceration have normal EAUS and ARM and would be recommended to have a vaginal delivery.[45]

[7]Women with traumatic cloacal defect may be offered Cesarean section due to possibility of tissue breakdown with subsequent vaginal delivery.[111]

[8]Surgical management includes secondary anal sphincter repair or SNM after recovery postpartum and/or when finished childbearing.

[9]If EAUS is not available, 2D-TPUS or 3D-TPUS can be utilized as a screening tool for presence of residual anal sphincter defect.[45] Women with anal sphincter defect identified on 2D-TPUS or 3D-TPUS require a referral to a centre with EAUS for confirmation of diagnosis.[45,47] Women without a residual anal sphincter defect on 2D-TPUS or 3D-TPUS do not require a referral for EAUS.[45]

[10]If ARM is not immediately available, then ARM is performed during subsequent pregnancy or prior to surgical management of fecal incontinence. In centres that do not have access to ARM, DRE can be utilized together with EAUS, 2D-TPUS, or 3D-TPUS.[42,61]

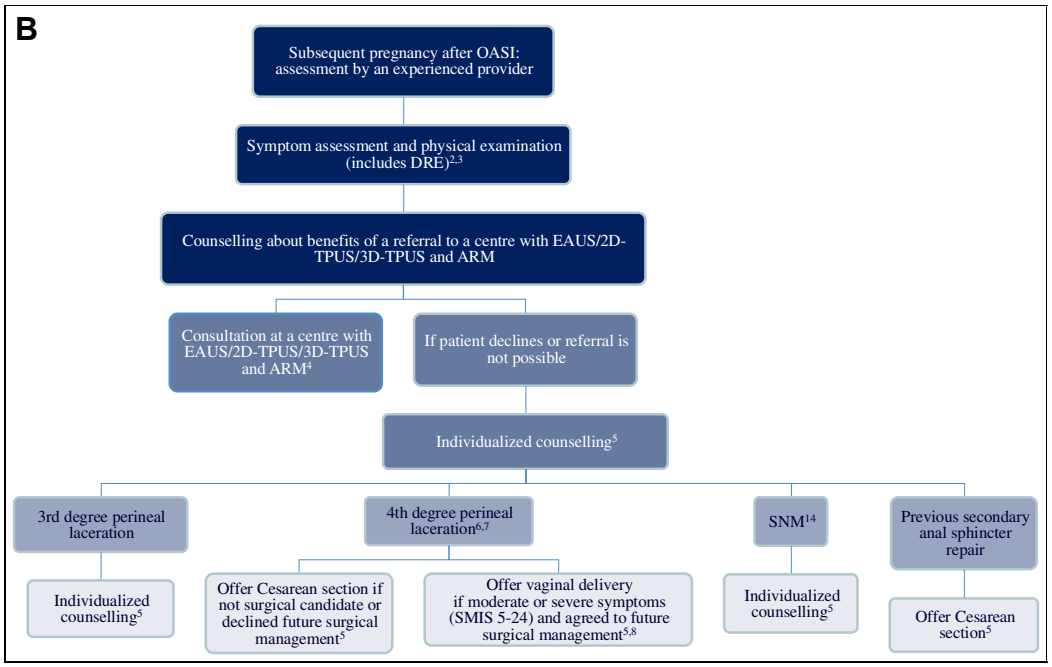
[11]Normal EAUS is defined as intact anal sphincter complex (overdiagnosis of OASI) or scar in the EAS.[25,27] Abnormal EAUS is defined a residual anal sphincter defect in the EAS.[27] Presence of IAS defect does not impact counselling regarding subsequent mode of delivery.[27] Abnormal 2D-TPUS or 3D-TPUS is defined as presence of a residual anal sphincter defect is $\geq$1 hour ($\geq$30°) in width partial or full thickness in $\geq$3 out of 7 slices for EAS and $\geq$2 out of 5 slices for IAS.[45]

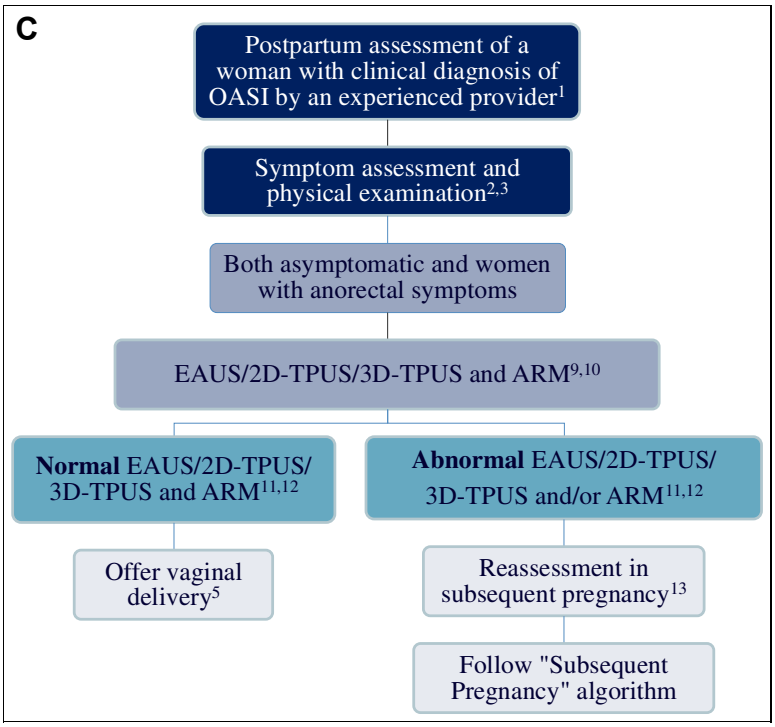
[12]Normal ARM is defined as iMSP $\geq$20mm Hg.[40] Abnormal ARM is defined as iMSP $<$20mm Hg.[40]

[13]For women with abnormal ARM postpartum, repeat ARM during subsequent pregnancy is recommended.[21,60] Women do not require repeat EAUS in subsequent pregnancy unless there is uncertainty regarding ultrasound findings.[40]

[14]The optimal mode of delivery after SNM is unknown and an individualized approach is needed.[113]

Figure 2. (*continued*).

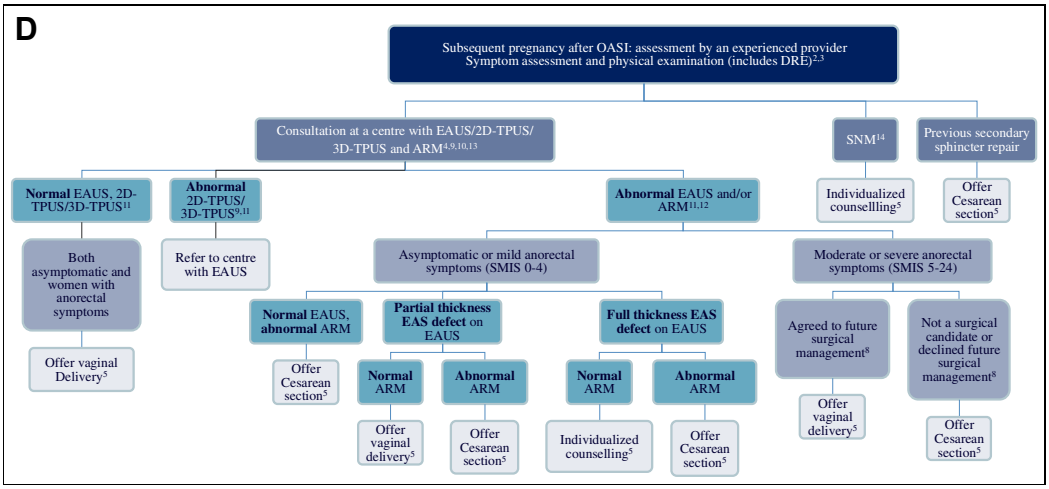




ultrasound findings.[40] For women with abnormal ARM postpartum, repeat ARM during subsequent pregnancy is recommended.[21,60] Elective Caesarean section can be considered for asymptomatic women with abnormal EAUS and/or ARM findings for prevention of de novo anorectal symptoms.[92]

OASI: obstetric anal sphincter injury; OASIs: obstetric anal sphincter injuries; DRE: digital rectal examination; EAUS: endoanal ultrasound; ARM: anorectal manometry; SMIS: St. Mark's Incontinence Score; DRESS: digital rectal examination scoring system; 2D-TPUS: two-dimensional transperineal ultrasound; 3D-TPUS: three-dimensional transperineal ultrasound; SNM: sacral neuromodulation; iMSP: incremental maximum squeeze pressure; rOASI: recurrent obstetric anal sphincter injury.

Figure 2. (*continued*).



At centres without EAUS and ARM, women with OASI can be offered an elective Caesarean section since 82-86.6% of these women have a residual anal sphincter defect.[36,44] Only 7% of women with OASI have normal EAUS and ARM and would be recommended to have a vaginal delivery.[45]

Women after secondary anal sphincter repair can be offered an elective Cesarean section. The optimal mode of delivery after SNM is unknown and an individualized approach is needed.[113] Theoretically, vaginal delivery can result in lead migration and/or damage, which can result in a non-functional device.[113-115]

RECOMMENDATIONS 11, 12 and 13

Vaginal Delivery

Subsequent vaginal delivery in women with history of OASI must be performed by an experienced clinician. Clinicians may consider a lower threshold for Caesarean section during labour if risk factors for rOASI are present (ex. Fetal macrosomia, prolonged labour, occiput posterior presentation, considering operative vaginal delivery).

Request for Elective Cesarean Section

Women with previous OASI are more likely to have an elective Caesarean section in subsequent pregnancy (OR 12.75).[116] Although an elective Caesarean section is the only means to eliminate the risk of rOASI, there is scant evidence regarding whether Cesarean section is protective against worsening anorectal symptoms. It is important to have a balanced discussion with the patient whether morbidity associated with Caesarean section outweighs potential benefits of preventing additional damage to the anal sphincter complex.[108,117]

RECOMMENDATIONS 14 and 15

Satisfaction with choice of subsequent mode of delivery

In women with prior OASIs, evidence is scarce regarding women's satisfaction or regret with the subsequent mode of delivery. A small survey study of 50 participants reported 10% moderate/severe regret and 54% no regret with decision regarding route of subsequent delivery.[2] Another study of 88 women after OASIs included 61 women with subsequent vaginal delivery and 27 women with subsequent Cesarean section reported high rates of satisfaction with subsequent mode of delivery in both groups (76% with satisfaction score $\geq$ 8 out of 10; with no significant difference between groups).[68] Overall, a systematic review concluded that there was no evidence of a difference in satisfaction or regret based on subsequent mode of delivery.[87] Further research is required to assess long-term regret regarding subsequent mode of delivery.

SUMMARY STATEMENT 10

BIRTHING FACILITIES AUDITS

For the purposes of quality improvement, birthing facilities should aim to conduct regular audits of 1) episiotomy and OASIs rates (baseline and trends), 2) standardized documentation of obstetrical trauma, management, patient disclosure, and education, and 3) adherence to best

practices described in part 1 and 2 of this guideline. Local OASI rates can be compared regionally or provincially. After review of departmental practices, birthing units can implement appropriate changes when required for optimization of patient care.[76] Various publications have documented changes in practice with resultant improved short-term outcomes after implementation of evidence-based OASI care interventions or bundles improvement projects.[118,119]

DOCUMENTATION AND MEDICO-LEGAL CONSIDERATIONS

OASIs not only have clinical implications but can also raise medico-legal issues. Courts often use national guidelines to assess standard of care in negligence cases. Failure to follow the national guideline may have significant legal implications, such as negligence claims. The need for thorough documentation is critical, as it can guide clinical practice, ensure accountability within the health care system, and impact legal outcomes. Appendix D presents suggested components of documentation for diagnosis and management of OASIs.

Informed consent is crucial in discussing potential risks associated with mode of delivery. The standard of care in obstetrics demands that practitioners adhere to established guidelines for prevention, recognition, and management of OASIs. There has been legal emphasis on patient autonomy over medical paternalism. To make informed decisions, patients must be informed of risks associated with medical procedures such as episiotomies and operative vaginal delivery. This stresses the importance of informed consent and risk disclosure, particularly in emergency circumstances and complicated deliveries.[120]

Comprehensive documentation of the delivery process, including detailed accounts of labour and delivery are important. Accurate recording of the degree of anal sphincter sphincter injury is critical for treatment. Documentation should also reflect patient counselling. A 2021 Canadian cross-sectional study of 73 women with OASI revealed low adherence to documentation of preventive measures such as fetal head control and perineal support during delivery, perineal massage and use of warm compresses, post-delivery DRE, follow-up care, and physiotherapy referrals. This study draws attention to better adherence to guidelines, improved documentation practices, and potentially, the implementation of checklists.[121]

Adequate documentation can improve patient safety by ensuring that care protocols are followed and can be audited for quality assurance. In the event of a legal claim, well-documented medical records serve as a critical defense tool, providing evidence of adherence to the standard of care.

The advent of electronic medical records has allowed for more detailed standardization of documentation including delivery summaries. In a 2021 retrospective study of hospital delivery records, the accuracy of documenting OASIs using electronic medical records compared to traditional hospital discharge codes was similar, but it may provide more accurate documentation for all types of perineal lacerations.[122]

In an audit of electronic medical records of patients affected by OASIs at two university hospitals, the quality of documentation significantly improved after implementation of a standardized electronic template for reporting diagnosis and repair of OASIs.[123] The appropriate use of antibiotics and bowel regimens also increased at both units.[123] A new protocol designed for documenting perineal lacerations provided significantly more complete and comprehensive information about perineal lacerations compared to the most common obstetric record system in Sweden.[124]

Development and implementation of standardized protocols based on national practice guidelines for management of labor and delivery will assist with advancing care for women with OASIs. Educating patients about the risks of OASI and subsequent delivery is also important and will assist in informed decision-making. As the field of obstetrics evolves, ongoing education and adherence to best practices in both care delivery and documentation will be crucial in addressing the complexities associated with OASIs.

RECOMMENDATION 16

EDUCATION AND RESOURCES

A 2020 review of available international guidelines revealed that many countries have national OASI guidelines.[125] However, there is no standardization amongst 13 available guidelines. Due to variable methodological quality and evidence used for recommendations, there is a need for a consensus international guideline to provide evidence-based care for women worldwide.[125]

It is important to provide educational resources to antepartum and postpartum women regarding perineal

lacerations, postpartum pelvic floor recovery, and importance of pelvic health physiotherapy and other options (e.g., pilates, yoga) where physiotherapy is not available. Regular training workshops can provide up to date information for healthcare providers on the recognition and management of OASIs, as well as the importance of documentation. Hands-on training regarding prevention, diagnosis, and management of OASI is important to optimize care for these women.[126] There are ongoing workshops geared towards obstetrical care providers including those offered by the International Continence Society (ICS), International Urogynecological Association (IUGA), Royal College of Obstetricians and Gynaecologists (RCOG), SOGC, and Canadian Society of Pelvic Medicine (CSPM).

A population-based cohort study based on real-world data of 324,930 nulliparous pregnant individuals with singleton spontaneous vaginal births at ≥22 weeks in Norway following the implementation of a national care bundle of education and training on correct perineal protection during childbirth to reduce increasing incidence of OASI reported that the rate reduced significantly from 5.4% during 2002−2004 to 2.1% during 2020−2022. The decrease in OASI incidence was attributed to the widespread adoption of manual perineal protection techniques, following comprehensive staff training.[127]

Good Practice Point 1 and 2

AREAS FOR FUTURE RESEARCH

Future research is required to provide evidence regarding optimal prevention, management, and care after OASIs. Areas of future research include the following (but not exclusively):

1. National rates of overdiagnosis and missed OASIs
2. Postpartum pelvic floor recovery after OASI
3. Outcomes of OASI management in dedicated multidisciplinary clinics
4. Development and validation of scales and questionnaires specific to women with OASIs
5. Role of vaginal estrogen postpartum in breastfeeding women with OASIs
6. Identification of modifiable protective factors for rOASI
7. Factors associated with development of anorectal symptoms post-OASI
8. The risk of symptoms with one versus recurrent OASI
9. Long-term anorectal outcomes after pelvic health physiotherapy in postpartum women with OASIs
10. Recommendations regarding subsequent mode of delivery after OASI based on long-term anorectal outcomes
11. Long-term regret about subsequent mode of delivery OASI

CONCLUSION

OASI and its associated pelvic floor disorders can have a profound impact on women's quality of life. A multidisciplinary longitudinal care approach with long-term follow-up is important to address unique needs of this patient population. Dedicated clinics for women with OASI are a valuable resource for debriefing and education, assessment of postpartum physical and emotional recovery, early identification and management of complications, empowering women to make an informed decision regarding subsequent mode of delivery, and counselling regarding prevention of pelvic floor disorders in the future. Pelvic health physiotherapy is important for all women with OASI. Future research is required regarding the optimal subsequent mode of delivery to optimize long-term outcomes and improve quality of life in this patient population.

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