



AOA

AUSTRALIAN
ORTHOPAEDIC
ASSOCIATION

PREGNANCY IN ORTHOPAEDICS

GUIDELINES FOR
TRAINEES AND TRAINERS

AUTHORS

Elizabeth G Garcia

BSc DML MBBS FRACS FAOrthA

Katherine Stannage

MBBS FRACS FAOrthA

Avanthi Mandaleson

BMedSci MBBS FRACS FAOrthA

Nicole Williams

BMedSci (HONS), BMed, Grad Cert
Sports Med, FRACS (ORTH)

APPROVAL AND REVIEW

Approved by AOA Board: February 2025

First published: August 2025

Last updated: August 2025

Next update due: August 2029

DISCLAIMER

This guideline provides an evidence-based summary of best practice for managing occupational hazards in orthopaedic surgery during pregnancy, that may arise during work in an orthopaedic environment. See full paper Garcia, E., Stannage, K., Mandaleson, A., Williams, N (2024) Occupational hazards and pregnancy in orthopaedics: female surgeons are at increased risk of infertility and pregnancy complications. ANZ Journal of Surgery 2024 Apr 8. doi: 10.1111/ans.18992. PMID: 38590139. Occupational hazards include but are not limited to radiation, bone cement, surgical smoke, anaesthetic gases, sharps injuries and physical demands. This guideline is provided for information purposes only to assist health professionals (including members and associate members of the Australian Orthopaedic Association (AOA)) who may come into contact with the orthopaedic operating theatre in the course of pregnancy. It is intended to be used to support health care workers who are pregnant, may be pregnant or intend on becoming pregnant to guide decision making regarding personal working circumstances, knowledge and expertise, and provide a consistent approach to managing the occupational hazard(s) identified. However, this guideline should not be viewed as a definitive guide to managing all occupational hazards in orthopaedic surgery during pregnancy. This guideline is not intended to constitute, replace and/or supersede any medical, legal or other professional advice, including but not limited to work health and safety principles and laws, and should not be relied upon as such. You should obtain independent medical, legal and/or other professional advice relevant to your circumstances as appropriate. To the maximum extent permitted by law, any person using the information in this guideline does so entirely at their own risk.

It is intended that this guideline will be reviewed every four years, or from time to time, and updated as necessary. This guideline has been prepared having regard to the information available at the time of its preparation, and health care professionals should therefore take into account any information that may have been published or has become available subsequently and seek up-to-date information and advice.

Whilst reasonable care has been taken by AOA in preparing this guideline, AOA makes no guarantees or warranties, and assumes no responsibility or liability, for the accuracy, currency or completeness of the information.

To the extent permitted by law, AOA excludes and disclaims all liability for any injury, losses, damages, costs, expenses or other adverse consequences arising directly or indirectly from the use of any information in this guideline and/or incurred by any person either as a result of the information in this guideline being (or becoming) inaccurate, unreliable or incomplete in any way for any reason.

INTRODUCTION

ACKNOWLEDGEMENTS

Thank you to everyone who contributed to this work, including women who have come before us and paved the way for mothers, parents and surgeons alike.

The authors would like to acknowledge the following people for their support and input to this project: Juliette Gentle (past chair, Orthopaedic Women's Link), Jennifer Green (past chair, Orthopaedic Women's Link), Sonya Black (senior solicitor, Avant Mutual), Ruanne Brell (senior solicitor, Avant Mutual), Michelle White (chief member experience officer, Australian Orthopaedic Association), Susie Obeid (membership and engagement manager Australian Orthopaedic Association).

MISSION STATEMENT – GUIDELINES

This document aims to assess the current literature in regard to occupational hazards in the orthopaedic operating theatre and how it pertains to pregnant health care workers. The aim of this document is to provide evidence-based recommendations to AOA members and trainees to support decision making and risk management for foetal exposure and mother wellbeing during pregnancy.

Recommendations are made based on assessment of the current evidence base and are considered up to date at the time of writing. Recommendations are intended as a guide and should not replace personalised medical review and advice.

Ultimately each pregnant worker must decide for themselves what is right for their personal circumstances.

PREAMBLE

Occupational hazards identified in the operating theatre include radiation, surgical smoke, working conditions, sharps injury, anaesthetic gases, toxic agents and more¹.

Such occupational hazards should be identified and controlled as much as practicable to minimise risks and complications to all healthcare workers. Any pregnant or potentially pregnant healthcare worker, including those going through fertility treatments and lactating women, needs to consider how these hazards relate to a developing foetus and breastfeeding child. All female surgeons, and all operating theatre staff regardless of gender or seniority, should be made aware of exposure risk and encouraged to manage such exposures without limiting a surgeon's activities, training and service provision unnecessarily.

THE EVIDENCE

Published evidence around occupational exposures in orthopaedics, both during pregnancy and in the normal course of work for all healthcare workers, is extensive and varied.

In preparation for these guidelines a literature review was performed. Additionally, telephone interviews were performed of female orthopaedic trainees and junior consultants who have experienced fertility treatments, pregnancy, pregnancy loss, delivery, interruption to training and return to work in recent years. This interview process was opt-in and self-referred. Experiences were varied. Findings from these interviews were intended to help design the structure and contents of these guidelines and the needs of the healthcare workers for whom these guidelines are intended.

These guidelines offer the recommendations that have arisen from this research. For the full literature review please see: 'Occupational hazards and pregnancy in orthopaedics: female surgeons are at increased risk of infertility and pregnancy complications'.

Garcia E, Mandaleson A, Stannage K, Williams N. Occupational hazards and pregnancy in orthopaedics: female surgeons are at increased risk of infertility and pregnancy complications. ANZ J Surg. 2024 Apr 8. doi: 10.1111/ans.18992. PMID: 38590139.

CONTENTS

Introduction	3
Preamble	4
The evidence	4
Flexible Training	6
AOA flexible training policy	6
RACS flexible training policy	6
Australian Human Rights Commission – Sex Discrimination Act 1984	7
Further information	7
Occupational hazards in the operating room	8
Introduction	8
Radiation	9
Methyl methacrylate	10
Surgical smoke	11
Sharps injuries	12
Anaesthetic gases	13
Formaldehyde	14
Surgical hand scrub	14
Physical demands and prolonged hours	15
Breastfeeding and lactation	16
Employment and entitlements	17
Maternity, paternity & parental leave	17
Entitlements for the pregnant employee	18
Planning maternity leave	19
Parental leave and keeping in touch days	20
Planning maternity leave	20
Dispute resolution	21
Returning to work	21
Breastfeeding and expressing	21
Support networks	22
References	23

FLEXIBLE TRAINING

AOA 21 FLEXIBLE TRAINING POLICY

AOA is committed to tailoring training to a trainee's individual circumstances without compromising on standards. The AOA 21 Training Program is flexible by design, as it is intended to respond to the individual development of each trainee.

The AOA 21 Flexible Training Policy, provides comprehensive information on flexible training options for AOA 21 trainees, including maximum training time, deferral of training commencement, interruption of training, leave, training region transfers, part-time training, recognition of prior learning and special consideration.

Any leave taken by the trainee is subject to the approval of the employing authority. For more information, AOA members can access the policy via [aoa.org.au/learn](https://www.aoa.org.au/learn)

RACS FLEXIBLE TRAINING POLICY

The Royal Australasian College of Surgeons defines flexible training as "less than full time training" and supports flexible training for any trainee regardless of gender. The aim is to "increase diversity in the surgical workforce by increasing the appeal of surgical training to more candidates" with the availability for trainees to "broaden their focus and pursue wider interests while training".

RACS have developed a Flexible Training Toolkit as a downloadable PDF to assist surgeons and trainees to develop flexible training posts.

For the full policy, access to the Flexible Training Toolkit, and previous surgeons' experiences, see:

<https://www.surgeons.org/Trainees/the-set-program/flexible-training>

AUSTRALIAN HUMAN RIGHTS COMMISSION – SEX DISCRIMINATION ACT 1984

The Sex Discrimination Act 1984 is a federal law which makes it unlawful to discriminate against you because of your sex, marital status, pregnancy, or potential to become pregnant; to dismiss you from your job because of your family responsibilities; or to sexually harass you.

The Australian Human Rights Commission (the Commission) supports pregnant workers in that “women who are pregnant should be able to continue to work in the same way and under the same conditions as other employees, unless there are valid medical or safety reasons”.

On returning to work after maternity leave, a woman has the right to return to the same job she had before going on leave according to the Sex Discrimination Act.

The Commission developed the Pregnancy Guidelines following the National Inquiry into Pregnancy and Work. ‘Pregnant and Productive: It’s a right not a privilege to work while pregnant’ was produced in 1998. This document supports workplaces on how to fulfill obligations under the Sex Discrimination Act.

The Pregnancy Guidelines state that “where medical issues are associated with a pregnancy or legitimate OH&S issues arise, employers should make reasonable adjustments in the workplace to allow pregnant employees to continue work”; and that it is not discriminatory towards male or non-pregnant employees to accommodate a pregnant employee.

FURTHER INFORMATION

<https://humanrights.gov.au/our-work/sex-discrimination/guides>

<https://humanrights.gov.au/our-work/sex-discrimination/publications/pregnancy-and-return-work-national-review-report>

<https://www.legislation.gov.au/C2004A02868/asmade/text>

OCCUPATIONAL HAZARDS

IN THE OPERATING ROOM

INTRODUCTION

Female surgeons have increased rates of infertility and pregnancy complications.¹⁻³ Infertility rates are reported at 32% compared to 10.9% in the general population.² Complications include pre-term labour and delivery, spontaneous abortion, intra-uterine growth restriction and congenital abnormalities.^{1,2} Complications were highest with the first pregnancy (35.6%) and reduced with subsequent pregnancy (30.7%). Complications were not associated with advanced maternal age, stage in career or time in the operating room. Yet, in a voluntary survey of orthopaedic surgeons in the US, overall satisfaction with pregnancy during training is high at 85% for trainees and consultants.²

Female surgeons are older at the time of their first live birth compared to the general population (33.1 vs 24.6 years)²; and compared to non-surgeon female partners of their male colleagues (33 vs 31 years).³ Of female orthopaedic trainees, 25.1% have at least one child during training.¹

Female surgeons compared to their male colleagues had fewer biological children (1.8 vs 2.3, $p < 0.001$), were more likely to delay their childbearing for training (65% vs 43%, $p < 0.001$), and were more likely to require assisted reproductive technologies (24.9% vs 17.1%, $p 0.04$).³ They were also more likely to have a non-elective caesarean delivery (25.5% vs 15.3%, $p 0.01$), musculoskeletal disorder (36.9% vs 18.4%, $p < 0.001$) and post-partum depression (11.1% vs 5.7% $p 0.04$)³ compared to non-surgeon female partners of male colleagues.

BIOLOGICAL CHILDREN



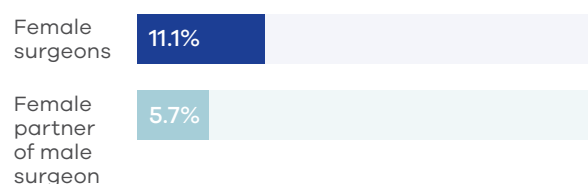
LIKELIHOOD OF DELAYING CHILDBEARING FOR TRAINING



LIKELIHOOD OF REQUIRING ASSISTED REPRODUCTIVE TECHNOLOGIES



RISK OF POST-PARTUM DEPRESSION



OCCUPATIONAL HAZARDS IN THE OPERATING ROOM



RADIATION

In pregnancy where a “pregnancy has been declared to the employer, clause 3.1.10 of the Code [Code of Practice for Radiation Protection in the Medical Applications of Ionizing Radiation (2008)] requires that the foetus be afforded the same level of protection as a member of the public”. Where a healthcare worker is exposed to radiation, estimates suggest 25% to 40% of radiation reaching the maternal abdomen penetrates the uterus to the foetus.⁴

The foetus should not receive more than 1mSv over the course of the pregnancy.⁵ This limit can be reached by a primary operator by wearing 0.25mm standard lead performing 800 dynamic hip screws (foetal dose of 0.001mGy per procedure), 71 tibial nails (foetal dose of 0.014mGy) or 23 long femoral nails with distal locking (foetal dose of 0.044mGy).⁶

RECOMMENDATIONS

1. An occupationally exposed pregnant staff member should be provided with a personal dose monitor.^{7,8}
 - a. A foetal dose monitor should be worn at the level of the uterus, under lead gowns.
 - b. A personal dose monitor should be worn at the level of the chest above lead gowns.
2. A foetus should not receive more than 1mSv of foetal radiation over the course of the pregnancy.
3. Lead aprons, thyroid shields and other personal protective devices should meet minimum design criteria as outlined in the Australian Standard (AS/NZS 2000a), be of at least 0.25mm thickness (equivalent to 150 kVp), and preferably using a separate wrap-around vest and skirt (no open back) with a thyroid shield.⁷
4. Pregnant workers may wish to consider purchasing their own personalised lead in minimum 0.25mm thickness. Lead is available in 0.5mm and 1mm thickness, as are specialty pregnancy gowns. Individual departments may wish to consider purchasing a pregnancy lead gown or increased thickness gown to be available for any employee (including those potentially pregnant or undergoing fertility treatments).
5. All lead should be tested annually for shielding integrity.⁷
6. Pregnant workers should consider whether they choose to opt out of, or minimise, intramedullary nailing throughout their pregnancy to avoid reaching the maximum pregnancy radiation limit.
7. Any person who is pregnant, or potentially pregnant, has the right to opt out of any procedures involving fluoroscopy. Failure to allow a pregnant worker to opt out constitutes discrimination on the basis of pregnancy or potential pregnancy.^{6,8}
8. Radiation dose should be minimised by avoiding continuous fluoroscopy, avoiding the use of magnification of the beam, and increasing the distance from the beam. For every meter further away from the beam, the dose is reduced by half.

OCCUPATIONAL HAZARDS IN THE OPERATING ROOM



METHYL METHACRYLATE

The use of methyl methacrylate (MMA) during pregnancy has been shown to remain below recommended threshold levels during routine orthopaedic practice. Where appropriate work practices are followed for oneself, the foetus is deemed to be safe.⁹ Studies show the use of vacuum mixing reduces MMA exposure significantly.⁹⁻¹¹ MMA is not listed as a human carcinogen.¹²

Wearing a surgical hood significantly reduces the inhaled exposure for the surgeon but increases the exposure to the scrub technician doing the mixing.⁹

RECOMMENDATIONS

1. Pregnant workers should consider limiting exposure to MMA bone cement to the recommended limit of four arthroplasty cases per day.
 - a. This includes two mixes of cement per case, using vacuum mixing and wearing a surgical hood for the primary surgeon and first assistant.⁹
2. Minimise handling of MMA cement, as this has been shown to increase the release of MMA vapours.¹⁰
3. Scrub technicians mixing the cement should consider not wearing a surgical hood due to increased exposure to MMA secondary to recirculation of expired air and air trapping in close proximity to MMA monomer.⁹
4. MMA has not been identifiable in breast milk.¹³ Breastfeeding and lactating women can safely continue working in cemented arthroplasty.



OCCUPATIONAL HAZARDS IN THE OPERATING ROOM



SURGICAL SMOKE

Contents of surgical smoke includes water, chemical gases, particulate matter, cellular material, bacteria and viruses.^{14,15} Higher smoke plumes are released from solid organs and fatty tissue compared to muscle.^{1,14} There are no studies on the effect of surgical smoke on reproductive outcomes.¹ However, various studies into components within surgical smoke including particulate matter, benzene, toluene and 1,2-dichlorethane have been shown to have an association with low birth weight, preterm labour, childhood leukemia, congenital defects, cognitive impairment, infertility and increased risk of miscarriage.¹

RECOMMENDATIONS

1. For use of diathermy, cautery, laser and diamond-drill, use local exhaust ventilation at the level of the tissue.
2. Consider the use of irrigation plus local suction when drilling to reduce exposure to ultrafine particles.¹⁸
3. Use a surgical mask, which should be worn snugly and changed often. Masks worn loosely or for too long are less effective¹⁵.
4. Consider the use of N95 mask for high aerosol-generating procedures, or where the tissue being cut may contain viruses.
5. High filtration masks should not be used as a substitute for local exhaust ventilation.¹⁵
6. Workers should be educated about surgical smoke and methods of reduction.



Surgical masks reduce exposure but not for particulate matter smaller than 5 μ m.¹⁶



However, N95 masks block particles down to 0.3 μ m.¹⁷

OCCUPATIONAL HAZARDS IN THE OPERATING ROOM



SHARPS INJURIES

Surgeons are at high risk of sharps injuries with high exposure-prone procedure rates. Sharps injuries are recognised to occur in up to 15% of operations, with suture needles being the most common source and the primary and first assistant surgeon being most at risk.¹⁹ Orthopaedic surgeons have poor reporting rates for sharps injuries, with up to 66% never reported.²⁰ By the end of training over 90% of trainees report a significant sharps injury, and 58.6% report at least three exposures.²⁰

Risks associated with seroconversion of bloodborne infection from large-bore needle injury in an unvaccinated surgeon is reported at 40% for Hepatitis B, 1.8% for Hepatitis C and 0.3% for Human Immunodeficiency Virus (HIV).²¹

Post exposure prophylaxis (PEP) exists for Hepatitis B and HIV, but not for Hepatitis C. Use of post-exposure prophylaxis depends on the recipient immune status and the infection being treated for. Exposure to an infected source with an undetectable viral load eliminates the risk of transmission of infection.²²

RECOMMENDATIONS

1. Be aware of the high risk of sharps injuries and practice meticulous sharps management, especially during wound closure for the primary surgeon and first assistant.
2. A pregnant healthcare worker may choose to avoid wound closure or opt out of operating on patients with known bloodborne viruses.
3. If any exposure occurs with a patient with a known bloodborne virus, follow local sharps injury protocols and seek urgent specialist immunology advice.²³
4. Where indicated, post-exposure prophylaxis should commence within 72 hours post exposure.²³
5. Reduce your risk of exposure by double gloving, use a blunt needle for closure of muscle and fascia, ensure hands-free zones for transfer of sharps, and use safety sharps devices.²⁶
6. A healthcare worker with a significant exposure requiring PEP does not need to avoid getting pregnant.²⁴
7. A breastfeeding worker with a significant exposure requiring PEP does not need to discontinue breastfeeding.²⁴

Australian guidelines recommend pregnant and breastfeeding women seek urgent specialist immunology opinion regarding the use of post-exposure prophylaxis.²³

Post exposure prophylaxis is safe in pregnancy for hepatitis B and HIV.^{22,24} There is no post-exposure prophylaxis for hepatitis C and treatment during pregnancy is contraindicated.^{1,25}

Risk of bloodborne infection from large-bore needle injury in an unvaccinated person

40%

Hepatitis B

1.8%

Hepatitis C

0.3%

HIV

OCCUPATIONAL HAZARDS IN THE OPERATING ROOM



ANAESTHETIC GASES

Halogenated and nitrous oxide gases are released into the air during anaesthesia and were recognised reproductive hazards prior to the introduction of scavenger air filter systems, with increased rates of spontaneous abortion among operating room nurses and increased risk of infertility in dental assistants.²⁷⁻³⁰

Paediatric intubation with nitrous oxide via a mask demonstrates the highest workplace concentration of nitrous oxide under modern scavenging systems and operating theatre air conditioning.³¹

Modern ventilation systems and laminar flow have been shown to reduce halogenated agents and nitrous oxide below safe levels.³¹⁻³³ No evidence of reproductive toxicity has been demonstrated with lower concentrations with modern scavenger systems, air conditioning and high-flow suction.³¹

N2O

Exposure is reduced by 50% for the circulating nurse compared to the anaesthetist (42ppm vs 95ppm).

RECOMMENDATIONS

1. Departments and operating theatre management teams need to ensure scavenger systems, laminar flow and ventilation within orthopaedic operating suites are up to date and maintain serviceability at all times.
2. There is no indication in the current literature for pregnant or breastfeeding women to take any additional precautions to reduce exposure to anaesthetic waste gases.
3. Paediatric intubation with nitrous oxide via a mask demonstrates the highest workplace concentration of nitrous oxide.³¹ Pregnant or potentially pregnant healthworkers may choose to reduce their exposure by distancing themselves from the patient during the induction, if possible.
4. All operating room personnel can reduce risk of increasing waste-gas pollution by ensuring fresh gas flow is turned off after mask ventilation and during intubation, and using airtight airway devices, where possible.
5. Work in well air-conditioned operating rooms with scavenging systems and high-flow suction.

OCCUPATIONAL HAZARDS IN THE OPERATING ROOM



FORMALDEHYDE

RECOMMENDATIONS

1. Consider avoiding anatomical laboratories and exposure to human cadavers during pregnancy due the risk of exposure to formaldehyde.
2. Where exposure cannot be avoided, exposure can be limited by use of an air-purifying respirator and gloves made of nitrile, butyl rubber or neoprene.⁴¹



SURGICAL HAND SCRUB

RECOMMENDATIONS

1. Povidone-iodine hand scrubs should be avoided during pregnancy and lactation to avoid high urine levels of iodine and risk of foetal hypothyroidism.⁴¹

OCCUPATIONAL HAZARDS IN THE OPERATING ROOM



PHYSICAL DEMANDS AND PROLONGED HOURS

The physical demands of surgical practice have been shown to significantly impact reproductive outcomes in female surgeons and the female partners of male surgeons. The physical activity associated with surgical practice, including long working hours, night shift and prolonged standing, have all been demonstrated to have effects on pregnancy.^{1, 3, 5, 34-36}

Physical and structural changes in the body occur due to the change in centre of gravity as the uterus increases in size and collagen cross-linking and concentration within ligaments reduces in response to oestrogen and the hormone relaxin.^{5, 37} During a pregnancy these changes can result in musculoskeletal pain and injury. Up to 60% of women with musculoskeletal injury and pain will require time off work due to their symptoms.³⁷ There is > 90% chance of recurrent symptoms with subsequent pregnancies if there is significant musculoskeletal pain or injury in a previous pregnancy.³⁷

Women working more than 40 hours per week have increased rates of pre-term labour, miscarriage and intra-uterine growth restriction.³⁵

RECOMMENDATIONS

1. Working hours should be kept as close to 40 hours per week as possible throughout pregnancy, and definitely below 60 hours per week, to reduce increased rates of miscarriage, pre-term labour and intra-uterine growth restriction.^{35, 38}
2. Non-standard working hours, including night shift, should be kept to a minimum and ideally avoided throughout pregnancy; and they should be completely avoided in the third trimester to reduce risk of pre-term labour and intra-uterine growth restriction.
3. Use opportunities to rest and sit down when able, as prolonged standing >8 hours per day results in increased rates of musculoskeletal injury; and operating >12 hours per week can result in time away from work.^{1, 3}
4. If musculoskeletal pain and injury are identified, consider medical review by a women's health physiotherapist, your obstetrician or an other medical provider.
5. Departments should consider altering workload and rostered hours for pregnant workers:
 - a. to ensure prolonged standing, non-standard working hours including night shift, and working hours >40 hours per week are avoided.
 - b. especially in the setting of musculoskeletal injury in a previous pregnancy, due to >90% chance of recurrence.
6. If spontaneous-onset, unilateral or bilateral hip pain commences, see your obstetrician or medical provider and consider reducing physical workload.
7. Consider wearing graded compression stockings (11–21mmHg) to reduce occupational leg swelling.³⁴

Night shift and non-standard hours of work increases rates of miscarriage.¹ Female surgeons are five times more likely to work >60 hours per week compared to the female non-surgeon partners of male colleagues.³⁸

Female surgeons are also 1.7 times more likely to have a pregnancy complication when operating more than 12 hours per week.^{3, 38}

OCCUPATIONAL HAZARDS IN THE OPERATING ROOM



BREASTFEEDING AND LACTATION

The greatest reason for surgeons ceasing breastfeeding after returning to work is due to lack of access to appropriate facilities and time.²

RECOMMENDATIONS

1. Every hospital and department must make appropriate facilities available for a breastfeeding woman.
 - a. This includes a clean sanitary area, behind a lockable door.
 - b. The ideal space will include a sink, disposable towels and a comfortable chair, bed or similar.
 - c. The ideal location is in close proximity to operating theatres and/or the orthopaedic department or ward to reduce unnecessary travel time. If outpatient clinics are in a separate building to the operating theatres, additional appropriate facilities should be made available in close proximity to the clinic.
2. An appropriate refrigerator must be available for storage of breastmilk.
 - a. This fridge should be only for storage of breastmilk, and not in a shared food refrigerator.
 - b. This fridge should be in a lockable location and is ideally within or in close proximity to the breastfeeding room.
3. A breastfeeding woman is entitled by law in Australia, under the Sex Discrimination Act 1984, to have access to sufficient breaks and time for breastfeeding and lactation.
 - a. This is in addition to any rostered breaks or mealtimes as necessary.
 - b. This includes a minimum of 30 minutes per break, per four hours rostered work.
4. For optimal breastfeeding and expressing of breastmilk, lactating women should remain well hydrated, ensure nutrition is optimised, and empty the breast often and regularly.³⁹
5. To avoid mastitis, the breast must be emptied of milk on a regular basis to avoid engorgement. If concerns about mastitis arise, seek medical attention quickly to avoid onset of sepsis.⁴⁰

EMPLOYMENT & ENTITLEMENTS

MATERNITY, PATERNITY & PARENTAL LEAVE

Countries around the world have different maternity, paternity and parental leave entitlements.

Australia is party to seven international human rights treaties, including the International Covenant on Economic, Social and Cultural rights (ICESCR), within which article 10(2) stipulates the right to maternity leave; as well as the Convention on the Elimination of All Forms of Discrimination Against Women (CEDAW) article 11(2)(b).

ICESCR ARTICLE 10(2)

The States Parties to the present Covenant recognize that special protection should be accorded to mothers during a reasonable period before and after childbirth.

During such period working mothers should be accorded paid leave or leave with adequate social security benefits.

<https://www.info.dfat.gov.au/Info/Treaties/treaties.nsf/AllDocIDs/CFB1E23A1297FFE8CA256B4C000C26B4>

CEDAW ARTICLE 11 (2)(b)

In order to prevent discrimination against women on the grounds of marriage or maternity and to ensure their effective right to work, States Parties shall take appropriate measures:[...]

(b) To introduce maternity leave with pay or with comparable social benefits without loss of former employment, seniority or social allowances

<https://www.info.dfat.gov.au/Info/Treaties/treaties.nsf/AllDocIDs/333D22B9ED69B058CA256B300024F1BA>

On average in OECD countries, women are offered 32 weeks paid parental leave and 18 weeks paid maternity leave around the time of birth or adoption of a child. The USA is the only OECD country that does not have statutory entitlements for paid leave, whereas the United Kingdom offers 39 weeks fully paid maternity leave. Australia offers 18 weeks paid maternity leave, two weeks father-specific paid leave, with no statutory entitlement for paid parental leave ; however, 52 weeks of unpaid parental leave can be accessed within the first two years after the birth of a child. In Australia, of 18 weeks of maternity leave, 12 weeks must be taken within the first 12 months after birth or adoption, with a further six weeks available at any time within the first two years.

<https://www.oecd.org/en/data/datasets/oecd-family-database.html>

EMPLOYMENT & ENTITLEMENTS

ENTITLEMENTS FOR THE PREGNANT EMPLOYEE

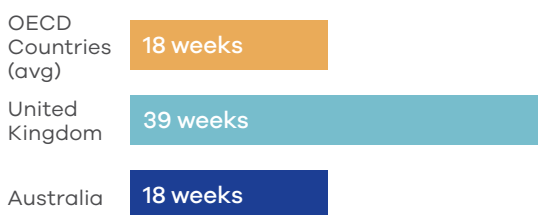
Australia recognises that pregnancy is not an illness or injury. However, pregnant employees can take sick leave if they experience pregnancy-related illness or injury.

SICK AND CARER'S LEAVE

<https://www.fairwork.gov.au/tools-and-resources/language-help/english/holidays-and-taking-time-off-work/sick-and-carers-leave>

In the event of pregnancy-related illness or injury, miscarriage or termination, an employee may be able to take Special Maternity Leave. This is unpaid leave which does not reduce the amount of unpaid parental leave that an employee can take. In the event of a still birth an employee cannot access special maternity leave but is entitled to take unpaid parental leave or compassionate leave. The current spouse or de facto partner of a woman who has a miscarriage is also entitled to compassionate leave.

MATERNITY, PATERNITY AND PARENTAL LEAVE



SPECIAL MATERNITY LEAVE

<https://www.fairwork.gov.au/tools-and-resources/fact-sheets/minimum-workplace-entitlements/parental-leave-and-related-entitlements#parental-leave-stillbirth>

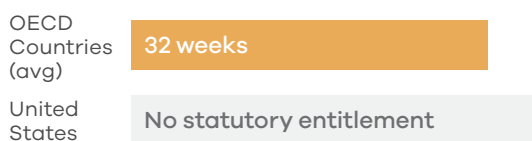
COMPASSIONATE AND BEREAVEMENT LEAVE

<https://www.fairwork.gov.au/leave/compassionate-and-bereavement-leave>

For more information on parental leave for stillbirth, premature birth or infant death, see:

<https://www.fairwork.gov.au/tools-and-resources/fact-sheets/minimum-workplace-entitlements/parental-leave-and-related-entitlements#parental-leave-stillbirth>

PAID PARENTAL LEAVE



EMPLOYMENT & ENTITLEMENTS

PLANNING MATERNITY LEAVE

Leave from training is separate to leave from your local department of health, which comes under government parental leave, through which you have access to 52-104 weeks of unpaid leave and 18 weeks of paid leave. Paid parental leave includes 12 weeks of continuous paid leave, to be taken while not working, plus 30 days (six weeks) of flexible paid parental leave, which can be used to reduce hours at work, to take days off or as a continuous block before, during or after returning to work.

Access to parental leave is not managed through AOA and must be applied for through the employment or HR department at your local hospital site. Note: many HR departments require a minimum of ten weeks' notice for parental leave.

Access to government payment is via the Australian government's Services Australia.

According to Services Australia, to access the Australian government parental leave entitlements you must:

- be the primary carer of a newborn or newly adopted child.
- have met the income test.
- not be working during your Paid Parental Leave period except for allowable reasons.
- have met the work test.
- have registered or applied to register your child's birth with your state or territory birth registry, if they're a newborn.

Hospitals, health services and private businesses may offer other paid leave entitlements in addition to, or in lieu of, government entitlements.

For more information on paid parental leave entitlements and other resources see:

Services Australia

<https://www.servicesaustralia.gov.au/parental-leave-pay>

Fair Work Australia

<https://fairwork.gov.au/leave/maternity-and-parental-leave/paid-parental-leave>

Australian Government Attorney-General's Department

<https://www.ag.gov.au/rights-and-protections/human-rights-and-anti-discrimination/human-rights-scrutiny/public-sector-guidance-sheets/right-maternity-leave>

Australian Government Productivity Commission report on Paid Parental Leave: Support for Parents with Newborn Children

<https://www.pc.gov.au/inquiries/completed/parental-support/report>

Other leave entitlements during parental leave

<https://www.fairwork.gov.au/leave/parental-leave/during-parental-leave/accruing-and-taking-other-leave-during-parental-leave>

EMPLOYMENT & ENTITLEMENTS

PARENTAL LEAVE AND KEEPING IN TOUCH DAYS

Australian employees on unpaid parental leave have access to ten keeping in touch days, which does not affect their unpaid leave entitlements. If unpaid leave is extended beyond 12 months, they can take an additional ten days.

Keeping in touch days can be worked as a part day, one day at a time, a few days at a time, or all at once. They must be worked at least 42 days after the birth or adoption of a child. They don't have to be used if an employee doesn't wish to.

Keeping in touch days are paid at an employee's normal wage and accumulate leave entitlements for each keeping in touch day or part day.

For more information see Fair Work Australia:

<https://www.fairwork.gov.au/leave/parental-leave/during-parental-leave/keeping-in-touch-days>

PLANNING MATERNITY LEAVE

When a trainee is taking time away from work for the birth or adoption of their child where they are not the primary carer, there are various options for leave entitlements.

For more information on partner leave and paid partner leave see:

Services Australia Dad and Partner Pay

<https://www.servicesaustralia.gov.au/dad-and-partner-pay>

Department of Social Services, Dad and Partner Pay

<https://www.dss.gov.au/our-responsibilities/families-and-children/programs-services/paid-parental-leave-scheme/paid-parental-leave-dad-and-partner-pay>

EMPLOYMENT & ENTITLEMENTS

DISPUTE RESOLUTION

For employees who need help resolving workplace issues about pregnancy, parental leave and returning to work, contact the Fair Work Commission or Fair Work Ombudsman.

Fair Work Australia, 'Fixing a workplace problem'

<https://www.fairwork.gov.au/workplace-problems/fixing-a-workplace-problem>

Australian Human Rights Commission, 'Supporting Working Parents' toolkit

See 'Pregnant employees', 'Working while pregnant (or potentially pregnant)', 'Employees and leave' and 'Returning to work from leave':

<https://humanrights.gov.au/our-work/employers/supporting-working-parents-toolkit-employers>

RETURNING TO WORK

In Australia, the Sex Discrimination Act 1984 states that a woman on returning to work following a period of maternity leave has the right to return to the same job she had before going on leave.

For information on entitlements when returning to work from parental leave and requesting flexible working arrangements see:

Fair Work Australia

<https://www.fairwork.gov.au/leave/parental-leave/after-parental-leave/returning-to-work-from-parental-leave>

<https://www.fairwork.gov.au/leave/parental-leave/after-parental-leave/flexible-work-after-parental-leave>

BREASTFEEDING AND EXPRESSING

In Australia breastfeeding in the workplace is protected under the grounds of discrimination. If a woman is made to feel uncomfortable about breastfeeding, or not provided adequate facilities and breaks, it may constitute discrimination.

For more information on entitlements around breastfeeding in the workplace and protection from discrimination at work, see:

Fair Work Australia

<https://www.fairwork.gov.au/leave/parental-leave/after-parental-leave/returning-to-work-from-parental-leave#breastfeeding-in-the-workplace>

The Australian Breastfeeding Association is a valuable resource for clinical and educational material, free phone support for any breastfeeding woman, and dedicated resources for working mothers and for employers to support creating a breastfeeding-friendly workplace.

<https://www.breastfeeding.asn.au/workplace/>

EMPLOYMENT & ENTITLEMENTS

SUPPORT NETWORKS

There are a lot of support systems available for new mothers in Australia. Each council community has a **maternal child health nurse** (MCHN) and centre funded through the department of health. Your MCHN is experienced and a wealth of knowledge. They are in charge of organising and running your local mothers group.

Your GP is an important resource, and as a medically trained person it is important that you attend the GP for medical review of yourself and your baby, rather than get caught up in self-diagnosis, or asking for 'corridor consults' from friends and colleagues.

ONLINE SUPPORT

In Australia, the recommended websites for information on newborns and children include the Raising Children Network

| <https://raisingchildren.net.au>

and the Royal Children's Hospital Guidelines

| www.rch.org.au/kidsinfo/

For evidence-based breastfeeding information that is reliable, refer to the Australian Breastfeeding Association (www.breastfeeding.asn.au), their Mum2Mum app, Feed Safe app and 24-hour phone line for advice from lactation consultants.

POSTPARTUM DEPRESSION AND ANXIETY

Postpartum depression and anxiety is an important issue to be aware of, to recognise, and to manage. As a highly functioning, busy and a 'type A' personality cohort, surgeons and trainees are at increased risk of post partum mental health concerns. The most important first step is to recognise it and ask for help. At work speak to your consultant, or a trusted colleague, or contact any OWL representative

| <https://aoa.org.au/for-patients/diversity/owl>

for non-judgemental advice and support. There are always options. Don't struggle. To have a healthy and happy baby, you need a happy and healthy mother! Outside of work there are a lot of support networks in Australia available to you, including the PANDA network

| www.panda.org.au

Beyond Blue

| www.beyondblue.org.au

And your local maternal child health nurse and your GP.

REFERENCES

1. Anderson, M. and R.H. Goldman, *Occupational Reproductive Hazards for Female Surgeons in the Operating Room: A Review*. JAMA Surg, 2020. **155**(3): p. 243-249.
2. Hamilton, A.R., et al., *Childbearing and pregnancy characteristics of female orthopaedic surgeons*. J Bone Joint Surg Am, 2012. **94**(11): p. e77.
3. Rangel, E.L., et al., *Incidence of Infertility and Pregnancy Complications in US Female Surgeons*. JAMA Surg, 2021. **156**(10): p. 905-915.
4. Osei, E.K. and C.J. Kotre, *Equivalent dose to the fetus from occupational exposure of pregnant staff in diagnostic radiology*. Br J Radiol, 2001. **74**(883): p. 629-37.
5. Vu, C.T. and D.H. Elder, *Pregnancy and the working interventional radiologist*. Semin Intervent Radiol, 2013. **30**(4): p. 403-7.
6. Uzoigwe, C.E. and R.G. Middleton, *Occupational radiation exposure and pregnancy in orthopaedics*. J Bone Joint Surg Br, 2012. **94**(1): p. 23-7.
7. Agency, A.R.P.a.N.S., *Safety Guide for Radiation Protection Diagnostic and Interventional Radiology, in Radiation Protection Series 2008*, Radiation Health & Safety Advisory Council.
8. Protection, I.C.f.R., *Radiological Protection in Medicine; Publication 105*. Annals of the ICRP, 2007. **37**(6): p. 1-63.
9. Speeckaert, A.L., et al., *Airborne Exposure of Methyl Methacrylate During Simulated Total Hip Arthroplasty and Fabrication of Antibiotic Beads*. J Arthroplasty, 2015. **30**(8): p. 1464-9.
10. Schlegel, U.J., et al., *Efficacy of vacuum bone cement mixing systems in reducing methylmethacrylate fume exposure: comparison of 7 different mixing devices and handmixing*. Acta Orthop Scand, 2004. **75**(5): p. 559-66.
11. Ungers, L.J., T.G. Vendrely, and C.L. Barnes, *Control of methyl methacrylate during the preparation of orthopedic bone cements*. J Occup Environ Hyg, 2007. **4**(4): p. 272- 80.
12. Australia, S.W., *Methyl Methacrylate* 2019. p. 1-8.
13. Linehan, C.M. and T.J. Gioe, *Serum and breast milk levels of methylmethacrylate following surgeon exposure during arthroplasty*. J Bone Joint Surg Am, 2006. **88**(9): p. 1957-61.
14. Limchantra, I.V., Y. Fong, and K.A. Melstrom, *Surgical Smoke Exposure in Operating Room Personnel: A Review*. JAMA Surg, 2019. **154**(10): p. 960-967.
15. Okoshi, K., et al., *Health risks associated with exposure to surgical smoke for surgeons and operation room personnel*. Surg Today, 2015. **45**(8): p. 957-65.
16. Barrett, W.L. and S.M. Garber, *Surgical smoke: a review of the literature. Is this just a lot of hot air?* Surg Endosc, 2003. **17**(6): p. 979-87.
17. Liu, Y., et al., *Awareness of surgical smoke hazards and enhancement of surgical smoke prevention among the gynecologists*. J Cancer, 2019. **10**(12): p. 2788-2799.
18. Schramm, M.W.J., et al., *Surgically generated aerosol and mitigation strategies: combined use of irrigation, respirators and suction massively reduces particulate matter aerosol*. Acta Neurochir (Wien), 2021. **163**(7): p. 1819-1827.
19. Berguer, R. and P.J. Heller, *Strategies for preventing sharps injuries in the operating room*. Surg Clin North Am, 2005. **85**(6): p. 1299-305, xiii.
20. Snovely, J.E., et al., *Needlestick and sharps injuries in orthopedic surgery residents and fellows*. Infect Control Hosp Epidemiol, 2019. **40**(11): p. 1253-1257.
21. Waljee, J.F., S. Malay, and K.C. Chung, *Sharps injuries: the risks and relevance to plastic surgeons*. Plast Reconstr Surg, 2013. **131**(4): p. 784-791.

REFERENCES

22. Kuhar, D.T., et al., *Updated US Public Health Service guidelines for the management of occupational exposures to human immunodeficiency virus and recommendations for postexposure prophylaxis*. Infect Control Hosp Epidemiol, 2013. **34**(9): p. 875-92.
23. McAllister, J. and t.N.P.G.E.R. Group, *Literature review for the national guidelines for post-exposure prophylaxis after non-occupational and occupational exposure to HIV (revised)*, A.S.f. HIV, Editor. 2016, Viral Hepatitis and Sexual Health Medicine: Sydney, NSW.
24. Schillie, S., et al., *CDC guidance for evaluating health-care personnel for hepatitis B virus protection and for administering postexposure management*. MMWR Recomm Rep, 2013. **62**(Rr-10): p. 1-19.
25. Prasad, M.R. and J.R. Honegger, *Hepatitis C virus in pregnancy*. Am J Perinatol, 2013. **30**(2): p. 149-59.
26. Centre, I.S., *Moving the Sharps Safety in Healthcare Agenda Forward in the United States:2020 Consensus Statement and Call to Action*, S.I.P.S. group, Editor. 2020, American College of Surgeons. p. 1-15.
27. Boivin, J.F., *Risk of spontaneous abortion in women occupationally exposed to anaesthetic gases: a meta-analysis*. Occup Environ Med, 1997. **54**(8): p. 541-8.
28. Administration, O.S.a.H. *Anesthetic Gases: Guidelines for Workplace Exposures*. 2000 1/10/2016; Available from: <https://www.osha.gov/waste-anesthetic-gases/workplace-exposures-guidelines>
29. Rowland, A.S., et al., *Nitrous oxide and spontaneous abortion in female dental assistants*. Am J Epidemiol, 1995. **141**(6): p. 531-8.
30. Rowland, A.S., et al., *Reduced fertility among women employed as dental assistants exposed to high levels of nitrous oxide*. N Engl J Med, 1992. **327**(14): p. 993-7.
31. Hoerauf, K., *Nitrous oxide: workplace concentrations/ecology*. Ballieres Clinical Anaesthesiology 2001. **15**: p. 389-396.
32. Krajewski, W., et al., *Occupational exposure to nitrous oxide - the role of scavenging and ventilation systems in reducing the exposure level in operating rooms*. Int J Hyg Environ Health, 2007. **210**(2): p. 133-8.
33. Deng, H.B., et al., *Waste anesthetic gas exposure and strategies for solution*. J Anesth, 2018. **32**(2): p. 269-282.
34. Partsch, H., J. Winiger, and B. Lun, *Compression stockings reduce occupational leg swelling*. Dermatol Surg, 2004. **30**(5): p. 737-43; discussion 743.
35. Snijder, C.A., et al., *Physically demanding work, fetal growth and the risk of adverse birth outcomes. The Generation R Study*. Occup Environ Med, 2012. **69**(8): p. 543-50.
36. Klebanoff, M.A., P.H. Shiono, and G.G. Rhoads, *Outcomes of pregnancy in a national sample of resident physicians*. N Engl J Med, 1990. **323**(15): p. 1040-5.
37. Gross, G.A. and J.W. George, *Orthopedic Injury in Pregnancy*. Clin Obstet Gynecol, 2016. **59**(3): p. 629-38.
38. Rangel, E.L., et al., *Pregnancy and Motherhood During Surgical Training*. JAMA Surg, 2018. **153**(7): p. 644-652.
39. Association, A.B. *Breastfeeding Friendly Workplaces*. 29/10/2024; Available from: <https://www.breastfeeding.asn.au/community-workplaces/breastfeeding-friendly-workplaces/how-bfw>
40. Association, A.B., *Breastfeeding: expressing and storing breastmilk*.
41. Landford, W.N., et al., *A Roadmap for Navigating Occupational Exposures for Surgeons: A Special Consideration for the Pregnant Surgeon*. Plast Reconstr Surg, 2021. **147**(2): p. 513-523.



AOA

AUSTRALIAN
ORTHOPAEDIC
ASSOCIATION



Orthopaedic
Women's
Link