

Improving Patient Understanding of Fetal Risk of Mycophenolate

The Pharmacist's Important Role



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This activity is intended to be fully compliant with the Mycophenolate REMS education requirements issued by the US Food and Drug Administration (FDA).

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Faculty

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Manager, Education & Staff Development

Assistant Professor of Pharmacy

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Jacksonville, Florida



Dr. Enderby is the Manager of Education & Staff Development at the Mayo Clinic in Florida. She is the PGY1 Pharmacy Residency Program Director, Pharmacy Student Program Director, and the Mayo Clinic Technician Training Program Assistant Program Director. She supports educational efforts for the department, including training, competencies, and professional development. Dr. Enderby received her Doctor of Pharmacy from the University of Florida and completed a PGY1 Pharmacy Practice Residency at Florida Hospital in Orlando. Dr. Enderby is a Board-Certified Pharmacotherapy Specialist and Board-Certified Nutrition Support Pharmacist. She is an Assistant Professor of Pharmacy with the Mayo Clinic College of Medicine.

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Faculty

Steven Gabardi, PharmD, BCPS, FAST, FCCP

Abdominal Organ Transplantation Clinical Specialist

Brigham and Women's Hospital

Assistant Professor of Medicine, Department of Medicine

Harvard Medical School

Boston, MA



Dr. Gabardi is a Clinical Specialist in Organ Transplant with the Department of Transplant Surgery at Brigham and Women's Hospital in Boston, and an Assistant Professor of Medicine at Harvard Medical School, where he became the first PharmD to receive an academic appointment. Dr. Gabardi earned his PharmD at Butler University's College of Pharmacy and Health Sciences in Indianapolis and completed his residency in pharmacy practice at Tufts Medical Center in Boston. Board-certified as a Pharmacotherapy Specialist and a Fellow of both the American Society of Transplantation and American College of Clinical Pharmacy, Dr. Gabardi has published in a multitude of textbooks and peer-reviewed journals. Dr. Gabardi became the first transplant pharmacist to be named an Associate Editor for both the *American Journal of Transplantation* and *Transplantation*.

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Disclosures

Drs. Enderby and **Gabardi** have no relevant affiliations or financial relationships with a commercial interest to disclose.

The clinical reviewer, **Lisa Holle, PharmD, BCOP**, has no relevant affiliations or financial relationships with a commercial interest to disclose.

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UAN: 0430-0000-22-126-H01-P

Credits: 1.5 hours (0.15 CEUs)

Type of Activity: Application

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Learning Objectives

- **Identify** the fetal risks associated with mycophenolic acid (MPA) use during pregnancy
- **Describe** approaches to effectively counsel patients in accordance with the Mycophenolate REMS program
- **Develop** innovative methods to improve and validate consistent patient understanding of MPA fetal risk and use of highly effective contraception
- **Recognize** the need for reporting pregnancies to the Mycophenolate Pregnancy Registry

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Mycophenolate and REMS Overview

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Mycophenolate

Immunosuppressant

Inhibits inosine monophosphate dehydrogenase

Used in combination with other immunosuppressants

Enderby CY, et al. *Am J Manag Care*. 2015;21(1 suppl):s12-s23.

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Comparison

| | Mycophenolate Mofetil (MMF) | Mycophenolic Acid (MPA) |
|--------------|--|--|
| Brand name | CellCept | Myfortic |
| Formulations | Capsule, tablet, oral suspension, injection | Delayed-release tablet |
| Indication | Prophylaxis of organ rejection in adult and pediatric recipients 3 months of age and older of allogeneic kidney, heart, or liver transplants, in combination with other immunosuppressants | Prophylaxis of organ rejection in adult patients receiving kidney transplants and in pediatric patients at least 5 years of age and older who are at least 6 months post kidney transplant. Use in combination with cyclosporine and corticosteroids |

CellCept (mycophenolate mofetil) prescribing information. Genentech; 2022. Accessed November 7, 2022. https://www.gene.com/download/pdf/cellcept_prescribing.pdf
Myfortic (mycophenolic acid) prescribing information. Novartis; 2022. Accessed November 7, 2022. https://www.novartis.com/us-en/sites/novartis_us/files/myfortic.pdf

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Drug Interactions

Decrease concentrations of mycophenolic acid (MPA)

- **Antacids with magnesium or aluminum hydroxide**
- Proton pump inhibitors (eg, lansoprazole, pantoprazole)
- **Drugs that interfere with enterohepatic recirculation** (eg, **cyclosporine**, **bile acid sequestrants/cholestyramine**, trimethoprim/sulfamethoxazole, **rifampin**, aminoglycoside, cephalosporin, fluroquinolone/*ciprofloxacin*, penicillin classes of antimicrobials/*amoxicillin plus clavulanic acid*, *norfloxacin* and *metronidazole*, *oral activated charcoal*)
- **Calcium-free phosphate binders** (eg, **sevelamer**)
- Drugs inducing glucuronidation (eg, telmisartan)

Increase concentrations of MPA

- Drugs inhibiting glucuronidation (eg, isavuconazole)

Bold: CellCept & Myfortic prescribing information; **Normal:** CellCept prescribing information; *Italics:* Myfortic prescribing information. CellCept (mycophenolate mofetil) prescribing information. Genentech; 2022. Myfortic (mycophenolic acid) prescribing information. Novartis; 2022.

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Drug Interactions Affecting Other Drugs

Increase concentrations and/or adverse reactions

- **Drugs that undergo renal tubular secretion** (eg, **acyclovir**, **ganciclovir**, **probenecid**, **valacyclovir**, **valganciclovir**)

Decrease effectiveness

- **Oral contraceptives**

Inhibit purine metabolism

- *Azathioprine*

Bold: CellCept & Myfortic prescribing information; **Normal:** CellCept prescribing information; *Italics:* Myfortic prescribing information. CellCept (mycophenolate mofetil) prescribing information. Genentech; 2022. Myfortic (mycophenolic acid) prescribing information. Novartis; 2022.

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Common Adverse Reactions

Mycophenolate Mofetil (MMF)

- Diarrhea, vomiting
- Leukopenia
- Infection
- Opportunistic infections

Mycophenolic Acid (MPA)

- Anemia, leukopenia
- Constipation, diarrhea
- Nausea, vomiting, dyspepsia
- Urinary tract infection, CMV (cytomegalovirus) infection
- Insomnia
- Postoperative pain

CellCept (mycophenolate mofetil) prescribing information. Genentech; 2022. Myfortic (mycophenolic acid) prescribing information. Novartis; 2022.

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Warnings and Precautions



| | | | | |
|--|----------------------------------|---|--|--|
| Embryofetal toxicity | Lymphomas and other malignancies | Serious infections | Blood dyscrasias | Gastrointestinal complications |
| Patients with hypoxanthine-guanine phosphoribosyl-transferase deficiency (HGPRT) | Acute inflammatory syndrome | Immunizations | Local reactions with rapid IV administration | Risks in patients with phenylketonuria |
| Blood donation | Semen donation | Potential impairment of ability to drive or operate machinery | <i>Management of immunosuppression by experienced physicians</i> | <i>New or reactivated viral infections</i> |

Bold: CellCept & Myfortic prescribing information; **Normal:** CellCept prescribing information; *Italics:* Myfortic prescribing information. CellCept (mycophenolate mofetil) prescribing information. Genentech; 2022. Myfortic (mycophenolic acid) prescribing information. Novartis; 2022.

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Pregnancy and Fetal Risks

- Increased risk of:
 - First trimester pregnancy loss
 - Congenital malformations

| General Population | Mycophenolate Exposed |
|--|---|
| <ul style="list-style-type: none">• Major birth defect: 2-4%• Miscarriage: 15-20% | <ul style="list-style-type: none">• Congenital malformations: 23-27%• Spontaneous abortion: 40-52% |

Le HL, et al. *Ther Drug Monit.* 2020;42(4):518-531.
CellCept (mycophenolate mofetil) prescribing information. Genentech; 2022. Myfortic (mycophenolic acid) prescribing information. Novartis; 2022.

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Fetal Risks



Cleft Lip



Cleft Palate



External Ear Abnormality

Perez-Aytes A, et al. *Eur J Med Genet.* 2017;60(1):16-21. Figure 2.
Facts about cleft lip and cleft palate. CDC. December 28, 2020. Accessed November 7, 2022. <https://www.cdc.gov/ncbddd/birthdefects/cleftlip.html>

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Mycophenolate REMS

(Risk Evaluation and Mitigation Strategy)

| Educate Healthcare Providers | Inform Female Patients of Reproductive Potential |
|--|--|
| <ul style="list-style-type: none">• Increased risks of miscarriage and birth defects• Counsel females of reproductive potential on importance of pregnancy prevention and planning• Report pregnancies to the Mycophenolate Pregnancy Registry | <ul style="list-style-type: none">• Increased risks of miscarriage and birth defects• Importance of pregnancy prevention and planning |

Mycophenolate REMS. 2021. Accessed November 7, 2022. <https://www.mycophenolaterems.com>

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Mycophenolate REMS Resources

www.MycophenolateREMS.com



[Home Page](#) | [Prescribing Information](#) | [Report a Pregnancy](#) | [Tell a Colleague](#)

Prescriber
Overview

Patient
Overview

Other Healthcare
Professionals Overview

REMS
Materials

Report a
Pregnancy

Additional
Resources

FAQs

For CME/CE
Community

WELCOME TO THE MYCOPHENOLATE REMS (Risk Evaluation and Mitigation Strategy)

Mycophenolate REMS. 2021. <https://www.mycophenolaterems.com>

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Program Resources and Educational Materials

Patient Information
Brochure: What You
Need to Know About
Mycophenolate

Healthcare Provider
Brochure

Dear Healthcare
Provider Letter &
Letter for Centers

Mycophenolate
Pregnancy Registry
Frequently Asked
Questions for Patients

Prescriber Training
Confirmation Form

Medication Guides

Mycophenolate REMS. 2021. <https://www.mycophenolaterems.com>

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Healthcare Provider Brochure

- Document REMS Training
- Educate females of reproductive potential on the increased risk of mycophenolate
- Check pregnancy status
- Reassess treatment options for patients who are considering becoming pregnant
- Report pregnancies



HEALTHCARE PROVIDER BROCHURE

Mycophenolate REMS. 2021. <https://www.mycophenolaterems.com>

What you need to know about mycophenolate use, first trimester pregnancy loss, and congenital malformations.

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Document REMS Training



PRESCRIBER TRAINING CONFIRMATION FORM

- Complete and submit the online Prescriber Training Confirmation Form by:
 - Visiting www.MycophenolateREMS.com
 - Calling 1-800-617-8191, faxing a hard copy to 1-800-617-5768, or emailing a copy to support@mycophenolateREMS.com
 - Mailing a hard copy to Mycophenolate REMS, 200 Pinecrest Plaza, Morgantown, WV 26505-8065

Mycophenolate REMS. 2021. <https://www.mycophenolaterems.com>

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Patient Brochure: What You Need to Know About Mycophenolate

- Risks of mycophenolate
- Pregnancy prevention
- Acceptable birth control options
- Pregnancy test
- What to do if you are thinking of having a baby
- What to do if you get pregnant
- Resources




**PATIENT INFORMATION
BROCHURE**

Mycophenolate REMS. 2021. <https://www.mycophenolaterems.com>

What you need to know about mycophenolate use and pregnancy risk

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Pharmacy Responsibilities



Pharmacies
do not
register with
Mycophenolate
REMS

Provide
medication guide
to patient when
mycophenolate is
dispensed

Mycophenolate REMS. 2021. <https://www.mycophenolaterems.com>

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Questions and Answers

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Mycophenolate REMS Counseling Points

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Definitions

Females of Reproductive Potential

- Girls who have entered puberty and all women who have a uterus and ovaries and have not passed through menopause

Menopause

- Permanent end of menstruation and fertility
- Should be clinically confirmed by a patient's healthcare practitioner
 - 12 months of spontaneous amenorrhea
 - Post-surgical from a bilateral oophorectomy

Mycophenolate REMS. 2021. <https://www.mycophenolaterems.com>

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Pregnancy Prevention

Discuss

Discuss birth control and pregnancy planning

Inform

Inform physician if interested in having a baby and do not stop taking mycophenolate before speaking with physician

Notify

Notify physician right away and do not stop taking mycophenolate if pregnancy occurs

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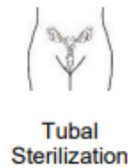
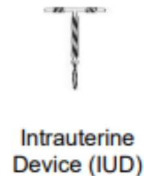
Acceptable Contraception Methods



Option 1 | Use Method Alone

- Pick one item from (A)
- ▶ **Most effective:** Less than 1 pregnancy per 100 women in one year

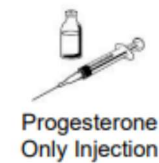
A



Option 2 | Use Hormone & Barrier

- Pick one item from (B) **and** one item from (C1) or (C2) shown below
- ▶ 4-7 pregnancies per 100 women in one year

B



Option 3 | Use Two Barriers

- Pick one item from (C1) **and** one from (C2)
- ▶ **Least effective:** 13 or more pregnancies per 100 women in one year

C



Mycophenolate REMS. 2021. <https://www.mycophenolaterems.com>

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Contraception: Option 1

Option 1 | Use Method Alone

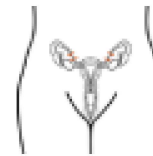
■ Pick one item from (A)

▶ Most effective: Less than 1 pregnancy per 100 women in one year

A



Intrauterine Device (IUD)



Tubal Sterilization



Vasectomy

Mycophenolate REMS. 2021. <https://www.mycophenolaterems.com>

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Contraception: Option 2

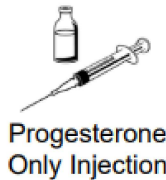


Option 2 | Use Hormone & Barrier

■ Pick one item from (B) **and** one item from (C1) or (C2) shown below

▶ 4-7 pregnancies per 100 women in one year

B



C

1



Female Condom



Male Condom

2



Female Diaphragm with Spermicide



Female Birth Control Sponge



Cervical Cap with Spermicide

Mycophenolate REMS. 2021.
<https://www.mycophenolaterems.com>

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Contraception: Option 3

Option 3 | Use Two Barriers

■ Pick one item from (C1) **and** one from (C2)

▶ Least effective: 13 or more pregnancies per 100 women in one year

C

1



Female Condom



Male Condom

2



Female Diaphragm with Spermicide



Female Birth Control Sponge



Cervical Cap with Spermicide

Mycophenolate REMS. 2021. <https://www.mycophenolaterems.com>

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Contraception Counseling: Duration



During entire
treatment

For 6 weeks
after stopping
treatment

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Pregnancy Tests

- One test immediately before starting mycophenolate
- Second test 8 to 10 days later
- Repeat at routine follow-up visits
- Pregnancy tests with sensitivity of at least 25 mIU/mL

Mycophenolate REMS. 2021. <https://www.mycophenolaterems.com>

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Male Patients

- Sexually active male patients and/or their female partners use effective contraception
- Male patients should not donate sperm
- Duration
 - During treatment
 - At least 90 days after treatment cessation

CellCept (mycophenolate mofetil) prescribing information. Genentech; 2022. Myfortic (mycophenolic acid) prescribing information. Novartis; 2022.

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Questions and Answers

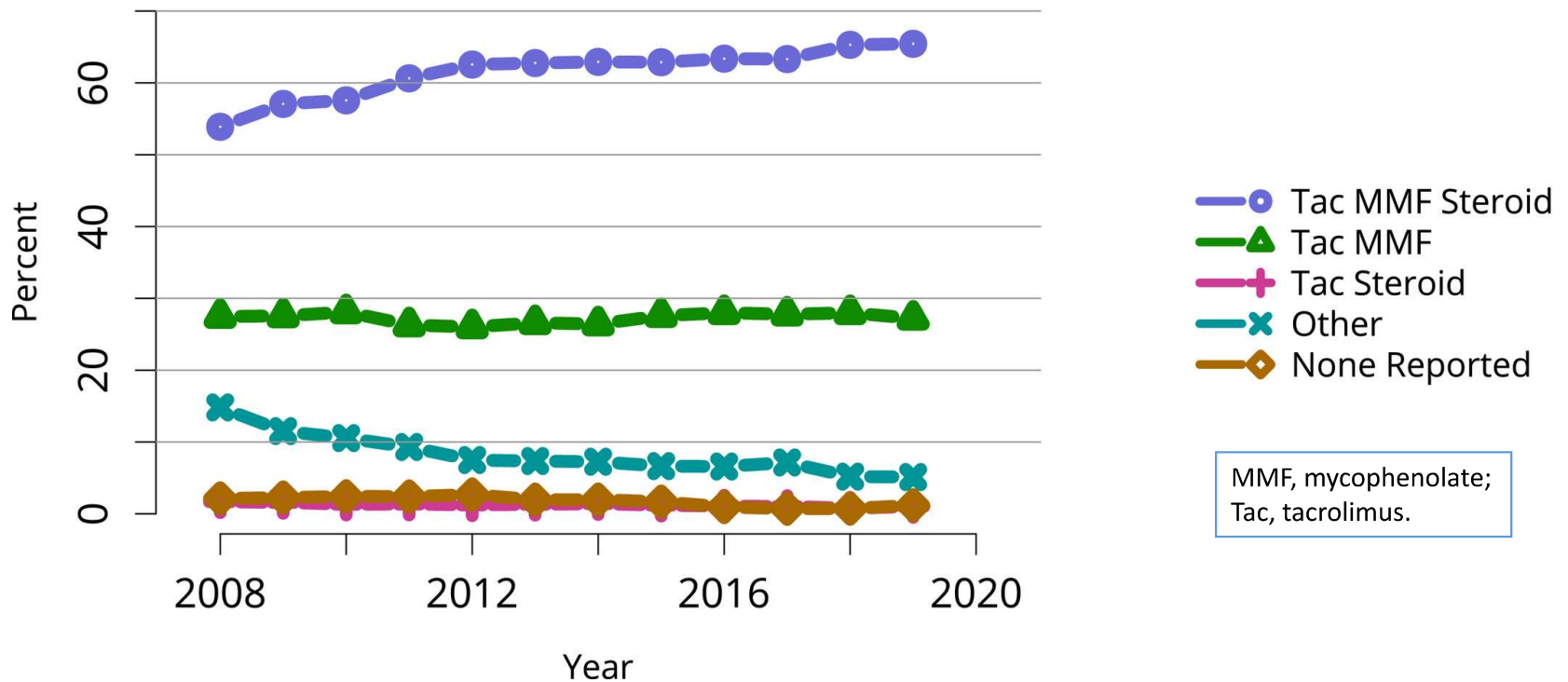
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Mycophenolate Alternative Treatment Options

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Mycophenolate's Role in Renal Transplantation



Hart A, et al. *Am J Transplant.* 2021;21(suppl 2):21-137.

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Proven Transplant Immunosuppressive Agents in Pregnancy

| Drug | Main Features | Former Category |
|--|--|-----------------|
| <i>Usually considered as safe</i> | | |
| Azathioprine | Azathioprine is teratogen in animal models. Case reports have demonstrated congenital abnormalities and growth retardation but cannot rule out maternal disease and other concomitant medications. KDIGO suggests switching from mycophenolate to azathioprine before pregnancy | D |
| Calcineurin inhibitors (cyclosporine, tacrolimus) | Cyclosporine and tacrolimus have not been associated with increased teratogenicity; however, small for gestational age babies and preterm delivery have been reported, possibly due to the maternal disease and not specifically to the drug. Levels may vary in pregnancy, and hypertension, hyperglycemia, and kidney function should be mentioned | C |
| Steroids | No major malformations have been reported, but a higher risk of premature rupture of membranes has been reported | C |

Kidney Disease: Improving Global Outcomes (KDIGO) Transplant Work Group. *Am J Transplant.* 2009;9(suppl 3):S1-S157. Lexi-Drugs Azathioprine/Cyclosporine/Tacrolimus/Prednisone. Lexicomp app. UpToDate Inc. Accessed November 8, 2022.

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Alternatives to Mycophenolate in Transplantation

| Drug | Main Features | Former Category |
|--|---|-----------------|
| <i>To be avoided</i> | | |
| Mycophenolate | Severe fetal malformations are reported, mainly involving cardiovascular and cranial malformations. Discontinuation for at least 6 weeks, to stabilize kidney function, is usually indicated after kidney transplantation | D |
| mTOR inhibitors (everolimus, sirolimus) | Very few studies have considered their use in pregnancy. They are teratogenic in animals and discontinuation in humans is a matter of debate. KDIGO guidelines suggest discontinuation in anticipation of pregnancy | C |
| Belatacept | In animal studies, belatacept was not teratogenic, but there is no data to prove safe use in pregnancy. Need for further evidence, but trials are unlikely to be undertaken | C |

mTOR: mammalian target of rapamycin.

KDIGO Transplant Work Group. *Am J Transplant*. 2009;9(suppl 3):S1-S157.
Lexi-Drugs Azathioprine/Cyclosporine/Tacrolimus/Prednisone. Lexicomp app. UpToDate Inc. Accessed November 8, 2022.

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Alternative Immunosuppressive Agents in Nontransplant Patients

| Medication | Pre-conception | During pregnancy | Breastfeeding |
|---|--|--|--|
| Conventional medications | | | |
| Hydroxychloroquine | ++ | ++ | ++ |
| Sulfasalazine | ++ | ++ | ++ |
| Colchicine | ++ | ++ | ++ |
| Azathioprine, 6-mercaptopurine | ++ | ++ | + Low transfer |
| Prednisone | + Taper to <20 mg/day by adding pregnancy-compatible immunosuppressants | + Taper to <20 mg/day by adding pregnancy-compatible immunosuppressants | + After a dose of >20 mg, delay breastfeeding for 4 hours |
| Cyclosporine, tacrolimus | + Monitor blood pressure | + Monitor blood pressure | + Low transfer |
| Nonsteroidal antiinflammatory drugs (cyclooxygenase 2 inhibitors not preferred) | + Discontinue if the woman is having difficulty conceiving | + Continue in first and second trimesters; discontinue in third trimester | + Ibuprofen preferred |

Tumor necrosis factor inhibitors (tumor necrosis factor inhibitors are considered compatible with pregnancy)

| | | | |
|---|----------------------------------|---|----|
| Certolizumab | ++ | ++ | ++ |
| Infliximab, etanercept, adalimumab, golimumab | + Continue through conception | + Continue in first and second trimesters; discontinue in third trimester several half-lives prior to delivery | ++ |
| Rituximab | + Discontinue at conception | + Life-/organ-threatening disease | ++ |

Other biologics (limited safety data; limited transfer in early pregnancy but high transfer in second half of pregnancy)

| | | | |
|---|--------------------------------|-----------------------------------|---|
| Anakinra, belimumab, abatacept, tocilizumab, secukinumab, ustekinumab | + Discontinue at conception | X Discontinue during pregnancy | + Expect minimal transfer due to large molecular size, but no available data |
|---|--------------------------------|-----------------------------------|---|

Not compatible with pregnancy

| | | | |
|---|--|---|--|
| Methotrexate | XX Stop 1-3 months prior to conception | XX Stop and give folic acid 5 mg/day | X Limited data suggest low transfer |
| Leflunomide | XX Cholestyramine washout if detectable levels | XX Stop and give cholestyramine washout | XX |
| Mycophenolate mofetil and mycophenolic acid | XX Stop >6 weeks prior to conception to assess disease stability | XX | XX |
| Cyclophosphamide | XX Stop 3 months prior to conception | + Life-/organ-threatening disease in second and third trimesters | XX |
| Thalidomide | XX Stop 1-3 months prior to conception | XX | XX |
| Tofacitinib, Apremilast, Baricitinib | Unable to determine due to lack of data; small molecular size suggests transfer across the placenta and into breast milk | | |

- ++ Strongly recommend
- + Conditionally recommend
- X Conditionally recommend against
- XX Strongly recommend against

Sammaritano LR, et al. *Arthritis Rheumatol.* 2020;72(4):529-556.

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Questions and Answers

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Patient Communication Strategies

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Recommended Strategies to Improve Communication

- Explain things using simple words
- Focus on key messages and/or actions
- Use a "teach-back" technique to evaluate the patient's understanding
- Encourage your patient to ask questions
- Use patient-friendly educational materials that are easy to understand

Agency for Healthcare Research and Quality (AHRQ). Accessed November 8, 2022.
<https://www.ahrq.gov/health-literacy/professional-training/pharmacy/resources/slides/strategies.html>

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Explain Things Using Everyday Words

- Slow down the pace of your speech and speak clearly
- Use plain, nonmedical language
 - “Birth defects” instead of “fetal malformation”

<https://www.ahrq.gov/health-literacy/professional-training/pharmacy/resources/slides/strategies.html>

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Focus on and Repeat Key Messages or Actions

Limit information and focus on a few key points

- Fetal risk
- Methods of birth control
- Try not to become pregnant while on mycophenolate, but inform provider if this happens
- When ready to become pregnant, work with patient to change transplant medications so they work best for both patient and baby

Discuss

- Discuss specifically what the patient needs to do

Review

- Review each key point at the end

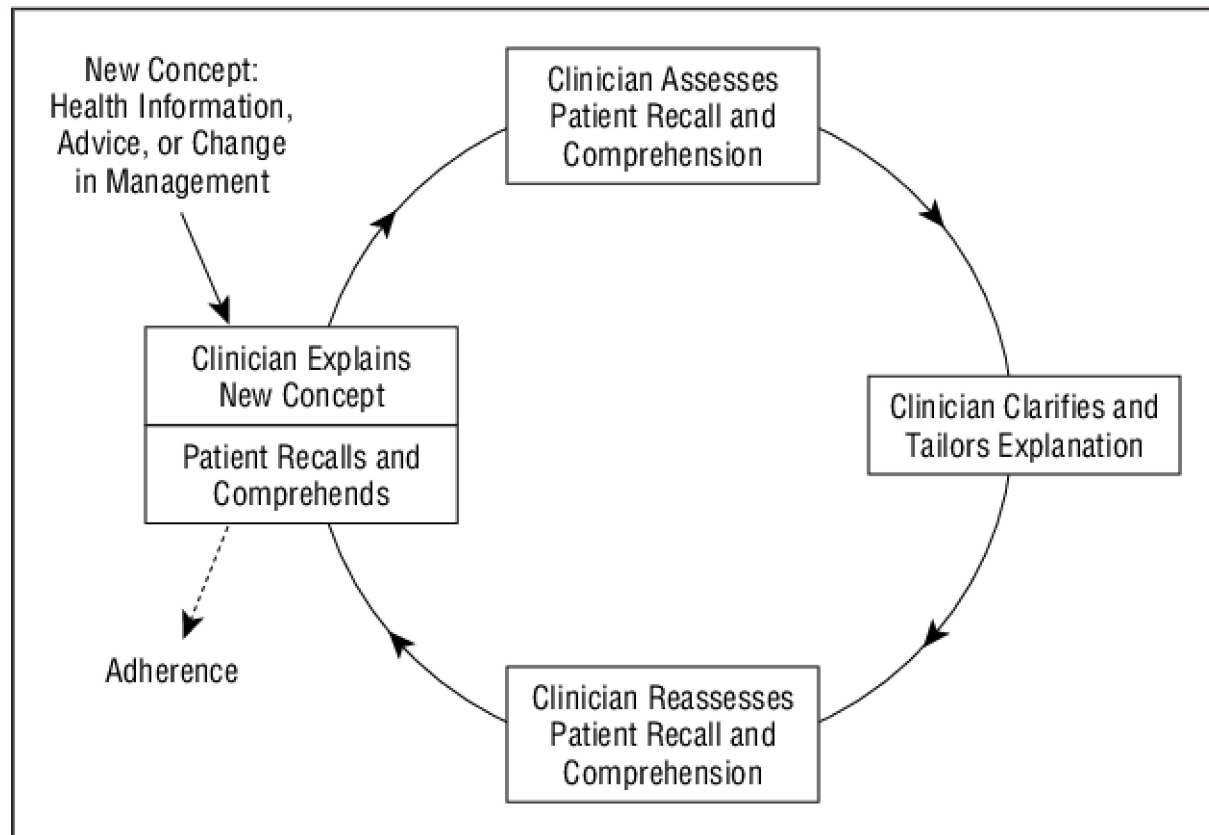
Repeat

- Make sure this is a topic that is not buried after the initial discussion. Repeated education should take place at multiple time points following initiation of mycophenolate

<https://www.ahrq.gov/health-literacy/professional-training/pharmacy/resources/slides/strategies.html>

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Use “Teach-Back” Techniques to Check for Clarity and Patient Understanding



<https://www.ahrq.gov/health-literacy/professional-training/pharmacy/resources/slides/strategies.html>

Schillinger D, et al. *Arch Intern Med.* 2003;163(1):83-90.

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Encourage Questions and Patient Interaction

- Do Ask:
 - What questions do you have?
 - When you're at home, can you reach out to any of your transplant practitioners via email, office phone, pager, or patient gateway to ask any follow-up questions?
 - Did anyone explain what to do if you become pregnant?
- Don't Ask:
 - Do you have any questions?
 - Questions?

<https://www.ahrq.gov/health-literacy/professional-training/pharmacy/resources/slides/strategies.html>

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Questions and Answers

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The Mycophenolate Pregnancy Registry

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What is the Mycophenolate Pregnancy Registry?

- Designed as a prospective, observational registry collecting data regarding mycophenolate exposure during pregnancy, and pregnancy, fetal, and infant outcomes after exposure
- Early and later term pregnancy outcomes will be solicited at selected gestational time points
- Structural and functional birth defects identified in the perinatal period through 1 year of life will be collected and classified
- Nonproprietary registry and a component of a comprehensive pregnancy REMS plan required by the FDA for all mycophenolate formulations

The Mycophenolate Pregnancy Registry. ClinicalTrials.gov Identifier: NCT01733082. <https://clinicaltrials.gov/ct2/show/NCT01733082>

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Healthcare Provider's Role in the Mycophenolate Pregnancy Registry

- **Instruct** patients to tell you if they get pregnant during treatment with mycophenolate or within 6 weeks following discontinuation of treatment
- **Report** pregnancies to the Mycophenolate Pregnancy Registry
 - By phone: **1-800-617-8191** (HCP or patient can call)
 - Online: HCP or patient can provide contact information online. Someone from the Registry will then contact you to confirm necessary healthcare information
- **Encourage** patients to participate in the Registry and read the *Mycophenolate Pregnancy Registry FAQs for Patients* on the website
- **Provide** the patient's and your contact information and information about the pregnancy so that she can be called for follow-up
 - The Registry is covered by a HIPAA waiver

Mycophenolate REMS. 2021. <https://www.mycophenolaterems.com>

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Healthcare Provider's Role in the Registry

- 
- Patients who participate in the Mycophenolate Pregnancy Registry agree to provide information about their pregnancy, including:
 - Prenatal drug exposure of any duration
 - Maternal demography and history
 - Maternal and fetal outcomes of pregnancies exposed to mycophenolate
 - Patients are encouraged to participate in the Registry as soon as their pregnancy is known, preferably in the first trimester

Mycophenolate REMS. 2021. <https://www.mycophenolaterems.com>

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Reporting a Pregnancy (Online)

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Steps for Participation in the Mycophenolate Pregnancy Registry

1. The patient should tell her prescriber if pregnant while taking mycophenolate or within 6 weeks of stopping the drug

2. The patient should be registered (by phone or online) in the Mycophenolate Pregnancy Registry (the Registry will contact the patient after registration)

3. The patient must complete an Informed Consent form

- The form tells the patient what to expect with the Registry and will be mailed with a preaddressed, postage-paid, return envelope
- By signing this form, the patient allows the Registry to ask you questions about her health and the baby's. The Registry will also seek information from her prescriber

4. The patient will be asked to answer questions about her health and the baby's (see next slide for information collected)

5. The Registry requests to know if the patient's contact information changes

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Information Collected When a Pregnancy is Registered


- For newly reported and ongoing pregnancies, questions are asked at baseline; first, second, and third trimesters; time of expected delivery; and at infant ages 2, 6, and 12 months. Data elements include but are not limited to:
 - Demographics
 - Mycophenolate exposure including dose and timing of exposure
 - Maternal and fetal outcomes
 - Root cause analysis (understand the circumstances that led to the fetal exposure)
 - Frequency of educational counseling
 - Infant development to age 12 months
- For completed pregnancies, the available information on the pregnancy outcome will be captured and any infant follow-up



Additional Educational Resources for Patients and Healthcare Providers

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Mycophenolate REMS Website



MYCOPHENOLATE REMS
RISKS OF FIRST TRIMESTER PREGNANCY LOSS
AND CONGENITAL MALFORMATIONS

Home Page | Prescribing Information | Report a Pregnancy | Tell a Colleague

Prescriber Login

Prescriber Overview | Patient Overview | Other Healthcare Professionals Overview | REMS Materials | Report a Pregnancy | Additional Resources | FAQs | For CME/CE Community

INFORMATION FOR PRESCRIBERS

Looking for Accredited REMS CME/CE Activities?
[Click here](#)

What is my role in the Mycophenolate REMS? *Click step to expand details.*

● **Step 1 - Document your training in the Mycophenolate REMS**

You should become familiar with the increased risks of embryofetal toxicity associated with mycophenolate and the requirements of Mycophenolate REMS:

- **First-trimester pregnancy loss**
- **Congenital malformations, especially**
 - external ear
 - cleft lip and palate abnormalities
- **Anomalies of**
 - the distal limbs
 - heart
 - esophagus
 - kidney
 - and nervous system

As a prescriber of mycophenolate, you should document your training in the Mycophenolate REMS by completing

Prescriber Training

To view the Healthcare Provider Brochure, and document your training, [click here](#).

REMS Materials

Download or Order materials, [click here](#).

DATA INSIGHTS

In December 2006, the National Transplantation Pregnancy Registry (NTPR) published data from prospective cases where 24 female transplant patients reported 33 mycophenolate-exposed pregnancies*. Of these pregnancies, there were:

- 15 spontaneous abortions (45%)
- 18 live-born infants

Four of the 18 live-born infants had

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Information for Patients



[Prescriber Overview](#)

[Patient Overview](#)

[Other Healthcare Professionals Overview](#)

[REMS Materials](#)

[Report a Pregnancy](#)

[Additional Resources](#)

[FAQs](#)

[For CME/CE Community](#)

INFORMATION FOR PATIENTS

I take mycophenolate, what do I need to know and do? [Click an item below to expand details.](#)

Understanding the increased risks of taking mycophenolate during pregnancy

If you are a girl or woman who can get pregnant, your doctor will talk with you about the increased risks of mycophenolate during pregnancy.

You need to learn about the following risks of mycophenolate in pregnancy:

- Higher risk of miscarriage during the first 3 months.
- Higher risk that the baby may be born with the birth defects:
 - Defects of the ears
 - Cleft lip or cleft palate
 - Defects of the arms, legs, heart, esophagus, kidney, and nervous system

[Click here](#) to see complete patient information in the *Patient Information Brochure: What You Need To Know About Mycophenolate*

[+ Do I need to use birth control?](#)

[+ Do I need a pregnancy test?](#)

[+ What if I am thinking about getting pregnant?](#)

[+ What if I get pregnant?](#)

Report a Pregnancy

To report a pregnancy, [click here](#).

REMS Materials

To view program materials online, [click here](#).

DATA INSIGHTS

In December 2006, the National Transplantation Pregnancy Registry (NTPR) published data from prospective cases where 24 female transplant patients taking mycophenolate reported 33 pregnancies*. Of these pregnancies, there were:

- 15 spontaneous abortions (45%)
- 18 live-born infants

Four of the 18 live-born infants had birth defects (22%).

Of the 77 females who took mycophenolate during pregnancy †:

- 25 had spontaneous

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Information for Other Healthcare Professionals



[Home Page](#) | [Prescribing Information](#) | [Report a Pregnancy](#) | [Tell a Colleague](#)

[Prescriber Overview](#)

[Patient Overview](#)

[Other Healthcare Professionals Overview](#)

[REMS Materials](#)

[Report a Pregnancy](#)

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[For CME/CE Community](#)

INFORMATION FOR OTHER HEALTHCARE PROFESSIONALS

Looking for Accredited REMS CME/CE Activities?

[Click here](#)

What do I need to know about the Mycophenolate REMS? [Click step to expand details.](#)

Step 1 - Understand the Increased Risks of Mycophenolate Use During Pregnancy

You should become familiar with the increased risks of embryofetal toxicity associated with mycophenolate:

- **First-trimester pregnancy loss**
- **Congenital malformations, especially**
 - external ear
 - cleft lip and palate abnormalities
- **Anomalies of**
 - the distal limbs
 - heart
 - esophagus
 - kidney
 - and nervous system

Step 2 - Counsel Females of Reproductive Potential

DATA INSIGHTS

In December 2006, the National Transplantation Pregnancy Registry (NTPR) published data from prospective cases where 24 female transplant patients reported 33 mycophenolate-exposed pregnancies*. Of these pregnancies, there were:

- 15 spontaneous abortions (45%)
- 18 live-born infants

Four of the 18 live-born infants had structural malformations (22%).

Of the 77 females exposed to systemic mycophenolate during pregnancy that were reported in postmarketing data¹:

- 25 had spontaneous abortions
- 14 had a malformed fetus or infant, of which six had ear abnormalities

While available data are limited, structural malformations occur in approximately 20% of live-born infants exposed in utero to mycophenolate. First trimester pregnancy loss rates have been reported to be approximately 45%*¹.

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Mycophenolate Pregnancy Registry



[Home Page](#) | [Prescribing Information](#) | [Report a Pregnancy](#) | [Tell a Colleague](#)

[Prescriber Overview](#)

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MYCOPHENOLATE PREGNANCY REGISTRY

What is the Mycophenolate Pregnancy Registry?

The Mycophenolate Pregnancy Registry is a way to collect information about pregnancies in female patients taking mycophenolate or within 6 weeks of stopping treatment. Females taking mycophenolate while they are pregnant have a higher risk of miscarriage in the first 3 months. There is also a higher risk that the baby will have birth defects.

Who should report a pregnancy to the Mycophenolate Pregnancy Registry?

- **Healthcare Professionals** - Report pregnancies to the Mycophenolate Pregnancy Registry using one of the 2 ways below.
- **Patients** - Tell your doctor if you get pregnant. Do not stop taking your mycophenolate medicine. Your doctor should report the pregnancy to the Mycophenolate Pregnancy Registry.

How do I report a pregnancy to the Mycophenolate Pregnancy Registry?

There are 2 ways to report a pregnancy:

1. **BY PHONE** - You can call the Mycophenolate Pregnancy Registry at 1-800-617-8191.
2. **ONLINE** - You can provide your contact information online to the Mycophenolate Pregnancy Registry. Someone from the Mycophenolate Pregnancy Registry will then contact you to confirm necessary healthcare information.

What should be reported to the Mycophenolate Pregnancy Registry?

Any pregnancy, planned or unplanned, that occurs:

- While taking mycophenolate or
- Within 6 weeks after stopping treatment.

For more information about the Mycophenolate Pregnancy Registry, click one of the links below:

[Patient FAQs](#)

[Prescriber FAQs](#)

Patients

I am a pregnant patient, please contact me.

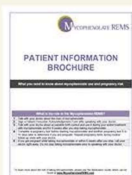
Healthcare Professionals

I am a healthcare professional, please contact me.

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Brochures and Medication Guides

Your REMS Materials:



Patient Information Brochure: What You Need To Know About Mycophenolate

- For prescribers to give to female patients of reproductive potential
- Contains the tools and materials to help patients understand the components of the Mycophenolate REMS

[View to Print or Save](#)



Healthcare Provider Brochure

- For prescribers

[View to Print or Save](#)



CellCept Medication Guide

[View to Print or Save](#)



Myfortic Medication Guide

[View to Print or Save](#)

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Questions and Answers

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