



Placenta Accreta Spectrum (PAS) Program

Highly specialized, highly experienced care for the treatment of placenta accreta, increta and percreta



Caring for you, together, every step of the way

Baylor College of Medicine and Texas Children's Pavilion for Women

Placenta Accreta Spectrum (PAS) is a serious pregnancy complication in which the placenta grows deeply into the wall of the uterus and is unable to detach after childbirth. Known as placenta "accreta", "increta" or "percreta" depending on the depth of invasion, these conditions lead to complex pregnancies and deliveries with the potential for life-threatening hemorrhage or other serious risks to mother and baby.

Our expertise in the treatment of these high-risk pregnancies has earned us global recognition, making our Placenta Accreta Spectrum (PAS) program one of the most experienced in the world. Every day, we deliver compassionate, evidence-based care for these mothers and babies, with outcomes that continue to attract a growing number of referrals.

Our program and outcomes are possible through the partnership of Baylor College of Medicine's Department of Obstetrics & Gynecology and Texas Children's Pavilion for Women, a one-of-a-kind facility known for groundbreaking maternal, fetal and newborn care. Together, we offer patients with the placenta accreta spectrum a highly experienced, multidisciplinary team of specialists, a family-centered facility with proven resources and protocols, and specialized services and nursing that set us apart.

Located in the Texas Medical Center in Houston, the Pavilion for Women is part of Texas Children's Hospital, the largest pediatric hospital in the nation. We are here for you. We offer the following information to help you learn more about this rare condition, risk factors, and what to expect during your pregnancy.

About Placenta Accreta Spectrum (PAS)

When a woman becomes pregnant, the placenta develops in the uterus, attaches itself to the uterine wall and begins providing nutrients and oxygen to the growing fetus through the umbilical cord. Known as the "afterbirth", normally immediately after childbirth the placenta afterbirth detaches from the uterine wall and is pushed out through the birth canal in vaginal deliveries or through the cesarean incision.

In cases of Placenta Accreta Spectrum, the blood vessels and other parts of the placenta grow too deeply into the uterine wall and become inseparable. Known as abnormally invasive placenta, or morbidly adherent placenta, the condition can be life-threatening, causing vaginal bleeding during the third trimester of pregnancy and severe hemorrhage after delivery.

There are several types of morbidly adherent placenta, depending on the severity:

- Placenta accreta – the placenta grows into the uterine lining
- Placenta increta – the placenta grows into the muscular wall of the uterus
- Placenta percreta – the placenta grows through the wall of the uterus and in some cases into adjacent organs, such as the bladder, colon, or nearby vessels

Placenta Accreta

Placenta attaches firmly to uterine wall lining

Normal Placenta

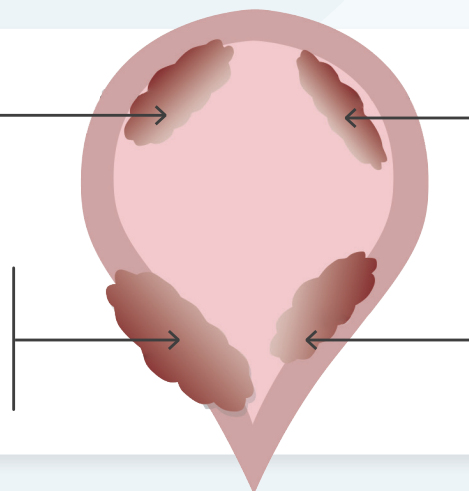
Separated from uterine wall by fine fibrinous layer

Placenta Percreta

Invasion through the uterine wall, sometimes into nearby tissues, like the bladder

Placenta Increta

Placenta invades at least halfway through uterine wall



Rising Incidence Rates

According to the American College of Obstetricians and Gynecologists (ACOG), the incidence of placenta accreta spectrum was 1 in 4,017 pregnancies in the 1970s, compared to 1 in 533 pregnancies by the year 2002, the most recent estimate as published by ACOG. An estimated 0.5% of patients with PAS die from the condition. With early diagnosis and specialized treatment, many of these deaths may be preventable.

Are you at Risk?

While the exact cause of morbidly adherent placenta is unknown, factors that can increase the risk of developing these conditions include:

- Placenta previa – a condition in which the placenta covers part or all of the cervix, or sits in the lower portion of the uterus; a reported 75% of women with morbidly adherent placental conditions have placenta previa
- Prior cesarean delivery – studies show an estimated 66% of women with morbidly adherent placenta have had prior cesarean deliveries; the risk increases with increasing numbers of cesareans
- Prior uterine surgery – including myomectomy (removal of uterine fibroids) or D&C (dilation and curettage)
- In vitro fertilization (IVF) – many women requiring IVF have had other intrauterine procedures
- Advanced maternal age – defined as 35 years or older
- Smoking
- Uterine conditions that cause abnormalities in the lining of the uterus, such as fibroids

Be an advocate for you. Ask your obstetrician if you are at risk for placenta accreta spectrum.



Diagnosis Saves Lives

Placenta Accreta Spectrum typically causes no symptoms, although bleeding may occur during the third trimester. With early diagnosis, plans can be put in place to minimize the risk of uncontrolled bleeding at delivery, and improve outcomes for mothers and babies.

If you have risk factors during pregnancy, such as placenta previa and/or previous cesarean deliveries, diagnosis can be made using imaging tests to evaluate the location of the placenta and look for abnormal growth into the uterine wall. Diagnostic imaging tests include:

- **Ultrasound** – most often used to diagnose PAS conditions
- **Magnetic Resonance Imaging (MRI)** – MRI is typically reserved for pregnancies in which ultrasound findings suggest complications that will likely require advanced multi-specialty care (e.g. extension of the placenta into the broad ligament, maternal bladder, or involving other areas of the maternal abdomen), the placenta is posterior and more difficult to evaluate with ultrasound, or ultrasound results remain unclear.

We identify at-risk patients through the latest advancements in maternal and fetal imaging, including state-of-the-art 2D and 3D ultrasound. The leading-edge technology we use and our imaging team's experience in evaluating and treating placenta accreta spectrum disease continue to improve outcomes and set our program apart.

Our Approach to Treatment

Delivery is carefully individualized and timed to minimize the risk of bleeding for you and to minimize the impact of prematurity for your baby. Our patients are typically delivered 4 to 5 weeks ahead of their due date through a planned cesarean delivery, followed immediately by local resection or a hysterectomy – the definitive treatment for placenta accreta.

The uterus, placenta, fallopian tubes, cervix, and surrounding tissues are usually removed, a procedure known as a modified radical cesarean hysterectomy. The goal is to prevent massive hemorrhage caused by the placenta's difficulty separating from these organs and tissues. We take care to help women keep their full vaginal length and ovaries to allow return to sexual function after healing and to prevent symptoms of menopause prior to the natural end of hormone production from the ovaries that comes with age.

A hysterectomy ends your ability to become pregnant. We cannot always attempt to save the uterus because of the risks associated with this more conservative approach, including:

- Delayed hemorrhage
- Prolonged treatment
- Delayed hysterectomy
- Risk of infection
- Recurrent placenta accreta spectrum and other complications in subsequent pregnancies; in one observational study, an estimated 28% of patients who do not undergo hysterectomy will develop another abnormally invasive placental condition

The treatment is the same for all placenta accreta spectrum conditions – placenta accreta, increta and percreta. The surgery is usually performed through a vertical abdominal incision that typically runs from just above the pubic area to just above the navel. This incision allows room to safely deliver the baby and perform the hysterectomy, while avoiding the invasive placenta, which is a major source of potential bleeding.

Surgery for Placenta Accreta Spectrum (PAS) Versus Normal Cesarean Delivery

(The surgical approach will be individualized to the specific needs of each patient.)

Type of Procedure	Modified radical cesarean hysterectomy	Routine C-section
Morbidity/Mortality	<ul style="list-style-type: none"> PAS occurs in 1 in 533 pregnancies 0.5% mortality 	<ul style="list-style-type: none"> 32.9% of all pregnancies (1 in 3) are delivered by C-section Extremely low mortality risk
Timing of Admission/Delivery; Length of Hospital Stay	<ul style="list-style-type: none"> Admission at 33 weeks Delivery by 34-35 weeks 4-5 day hospital stay 	<ul style="list-style-type: none"> Delivered at term (39 weeks or more) 2-4 day hospital stay
Impact of placenta previa	<ul style="list-style-type: none"> Cesarean delivery recommended by 34-35 weeks Massive bleeding may occur 	<ul style="list-style-type: none"> May require hysterectomy to control bleeding
ICU	<ul style="list-style-type: none"> Overnight stay in ICU following surgery May require mechanical ventilation 	<ul style="list-style-type: none"> Not required; patient sent to regular room
Fetal Considerations	<ul style="list-style-type: none"> Preterm delivery Steroids to help protect lungs, brain and intestinal tract Most require NICU stay 	<ul style="list-style-type: none"> Delivery at term NICU admission rare
Blood Loss	<ul style="list-style-type: none"> Heavy blood loss Transfusions often required (as many as 90% of placenta accreta patients require transfusions) 	<ul style="list-style-type: none"> Minimal blood loss
Possible Complications	<ul style="list-style-type: none"> Excessive bleeding Hemorrhagic shock • Death 	<ul style="list-style-type: none"> Low rate of serious complications
Type of Surgical Incision	<ul style="list-style-type: none"> Long vertical skin incision, which may be visible above underwear or bikini 	<ul style="list-style-type: none"> “Bikini cut,” sometimes can be hidden by underwear
Length of Surgery	<ul style="list-style-type: none"> Typically several hours (on average 4-5 hours) Highly complex cases may last up to 13+ hours 	<ul style="list-style-type: none"> Often 10-15 minutes from incision to delivery (within 5 minutes for emergency C-sections) Additional 45 minutes for delivery of the placenta and suturing May require more time if a repeat cesarean delivery
Anesthesia	<ul style="list-style-type: none"> General anesthesia during hysterectomy An arterial line in the wrist and central IV line in the neck required May be eligible for epidural for delivery, if considered safe with anesthesiologist consult 	<ul style="list-style-type: none"> Epidural or combined spinal epidural common General anesthesia occasionally required

An Experienced Team Partnering with You

Our experience, innovation and success in research, quality improvement and in treatment of the most severe cases of placenta percreta is attracting a growing number of patients from across the country seeking the best available maternal, fetal and neonatal care.

We provide women and their babies a comprehensive approach to treatment of PAS, including:

- A highly experienced, multidisciplinary surgical team
- Delivery at hospitals with subspecialty care
- Access to transfusion facilities and adequate blood bank supplies
- Access to Level 4 NICU
- Reproductive psychiatry support
- Maternal transport

We are prepared and equipped to address the needs of you and your family throughout every step of these complex pregnancies and deliveries, coordinating and mobilizing the resources required should emergencies arise along the way.

Delivery is performed at Texas Children's Pavilion for Women, Ben Taub Hospital, or other partner hospitals, depending on the needs of the patient. All patients are cared for by the same multidisciplinary team of specialists, regardless of where they are delivered.

Despite optimal planning, transfusion management and surgical care, there remains a risk that maternal death may occur due to the severity of hemorrhage caused by abnormally invasive placenta conditions.

Your Specialized Healthcare Team

Here, you'll be cared for by a highly skilled, highly experienced team of specialists, including:

- Maternal-Fetal Medicine
- Gynecologic Oncology (for refined surgical skills and expertise removing abnormal tissue)
- Anesthesiology
- Blood Bank/Transfusion Medicine
- Urology (for cases where the placenta has adhered to the bladder)
- Pulmonary & Critical Care
- Neonatology
- Reproductive Psychiatry/Support Groups
- Interventional Radiology/Radiology
- Pathology
- Respiratory Therapy
- Specialized nurses and support staff

Prenatal Care – What to Expect During Your Pregnancy

Throughout your pregnancy you will be cared for by Baylor College of Medicine Maternal-Fetal Medicine specialists – physicians specially trained in the treatment of high-risk pregnant women and their unborn babies. Your prenatal visits will take place at one of our clinic locations in the Texas Medical Center.

While your care will be individualized based on your unique needs and pregnancy, prenatal care for abnormally invasive placenta patients typically includes:

- Basic recommended prenatal care
- Oral and/or IV iron supplements, for treatment of anemia prior to any expected blood loss
- Steroids to promote lung function in preterm babies
- Frequent prenatal visits compared to routine pregnancy
- Regular ultrasounds, as often as needed to monitor the baby’s growth
- Consultations with your care team, most of which take place after admission
- The need to be in close proximity to the hospital as your planned delivery date approaches; our Patient Services team is available to help out-of-town patients find temporary accommodations
- Admission at 33-34 weeks and delivery by 34-35 weeks, earlier if bleeding or contractions occur during pregnancy
- Treatment of coexisting maternal or neonatal conditions by our multidisciplinary team of specialists, to reduce the risk to both mother and baby

What to Tell Your Family and Friends

Family and friends need to be informed about the seriousness of your condition – including the risks of premature delivery, life-threatening hemorrhage, and the need for a hysterectomy – so they can be prepared to support you and your partner throughout the pregnancy, at delivery and postpartum.

Support groups and counseling are available through Baylor College of Medicine’s Women’s Place – Center for Reproductive Psychiatry, to help you and your family deal with the emotional challenges that can accompany reproductive health issues.

About Baylor College of Medicine

As Baylor College of Medicine faculty members, our physicians not only provide expert clinical and surgical care, they are in the classroom educating the next generation of PAS specialists and in the lab conducting innovative research to improve our understanding and treatment of these devastating conditions. As a result, we are uniquely positioned to bring you the latest advancements in the diagnosis and treatment of abnormally invasive placenta.

For Referring Physicians

We partner with you, to serve your highest risk patients.

If you suspect your patient is at risk for PAS, we encourage you to refer them as soon as possible for a diagnostic ultrasound and consultation. Early referral enables ample time for evaluation and care coordination. Patients with two or more of the following risk factors and ultrasound indicators are at an increased risk for PAS.

Placenta Accreta Spectrum Risk Factors & Ultrasound Indicators

(2 or more of the following increase risk)

Risk Factors

- History of cesarean section (low transverse or classical)
- Placenta previa
- History of uterine surgery (myomectomy, D&C)
- History of placenta accreta spectrum
- In vitro fertilization (IVF)
- Endometrial ablation
- Smoking
- Advanced maternal age (AMA)

Imaging finding suggestive of PAS (any 1 or more suggestive of PAS)

Grayscale Ultrasound:

- Irregular placental lacunae (placental lakes)
- Placental bulge (placental tissue into neighboring organ, typically bladder; uterine serosa appears intact but outline shape is distorted)
- Bladder wall interruption
- Retroplacental myometrial thickness <1mm
- Loss or irregularity of hypoechoic retroplacental zone (myometrium underneath the placental bed)
- Any suspected c-section scar pregnancy or any other irregularity

Color Doppler Ultrasound:

- Blood vessels or placental tissue bridging from the placenta, across myometrium and beyond serosa into bladder or other organs

3D Doppler Ultrasound:

- Hypervascularity or coherent vessels in the myometrial-bladder interface or retroplacental zone

MRI:

- Myometrial thinning
- Placental Bulge
- Dark banding on T2 weighted images
- Enlarged intraplacental vessels

Complete the Online Referral Form

To refer your patient to the multidisciplinary PAS team, complete the Maternal-Fetal Medicine referral form online available at:

[women.texaschildrens.org/health-professionals/refer-patient/maternal-fetal-medicine](https://www.women.texaschildrens.org/health-professionals/refer-patient/maternal-fetal-medicine).

Select the Pavilion for Women location and check the Placenta Accreta Program box on the form as the reason for consultation. Once a referral is completed, a nurse will call your patient within 2-3 business days to schedule an appointment with the PAS team.

Whenever possible, we recommend a transfer of care be requested by 24 to 28 weeks, to allow ample time for safe delivery planning. If you need to expedite the referral due to later gestational age, please complete the online referral form and then call **832-826-4MFM** (4636). We look forward to working together to care for your high-risk patients.

For hospital-to-hospital transfers or telephone consultation, please contact our Transfer Center at **832-824-5550**.



My Percreta Story – A Patient Letter

*“Being a **mother** is learning about strengths you didn’t know you had, and dealing with fears you didn’t know existed.” - Linda Wooten*

The first thing I would tell a patient with accreta/percreta is to acknowledge the situation. It won’t benefit you in any way if you deny what is happening. Realize that it is okay to be scared about your situation. You may need to hear the information once, then go home have a good cry, and then hear the information again at your next appointment.

One piece that was really hard for me was accepting the fact that I had to have a hysterectomy. I already had three kids and we were done at four regardless, but it was the fact that it was not my choice. The decision was made for me and that was hard for me to accept.

Once you have all of the information and a plan is laid out, take a deep breath. You are in the best place possible to take care of you and your baby. The doctors and staff are amazing! Dr. Fox and Dr. Belfort are extensively trained in this condition. I went to or called every high risk OB in DFW. All of them said accreta/percreta is extremely rare. The majority of them stated that it was out of their scope of practice. The others said they would try to take care of me, but that they hadn’t seen a case since their residency, or for 15 years, or they would have to research it. None of that was comforting. So I went to work trying to find the best place for me. I knew that I valued my life and my son’s life more than to be somebody’s case study. I wanted to go to a place that had seen accreta/percreta before, had protocols already in place, and had an amazing success rate. Then I found Dr. Belfort’s research and knew this is where I needed to be. As he states he works with the best in the country. I couldn’t agree more! They have protocols in place that ensure the best possible outcome for you and your baby. I was scared about the whole situation, but especially about having a baby born early. I can handle going through this, but I wasn’t sure what implications my baby would have as a result of the surgery. What gave me a huge peace of mind was that I was at a children’s hospital. Nowhere else can you be guaranteed that you have the best people for you and should your child need any interventions, Texas Children’s Hospital has the best neonatologists in the country.

Finally, a little advice that helped me through my journey:

- It’s okay to get emotional. It is a huge undertaking and can be scary. It is okay to be upset about the hysterectomy, the disappointment of not having the ideal birth, and the unknown of the upcoming delivery.
- Do not get down on yourself; this is not your fault nor anyone else’s.
- Try to keep calm about the situation. Stress will not help you or the baby. Talk to a professional if you need it.
- Use your resources. If you have questions ask your doctor or NP. This group deals with this all the time, pick their brains.
- Be open and honest with your friends and family. It is so important to have their support. Once you are in the hospital it can be an isolating experience. Having a solid support group can make all the difference.
- Go on a family vacation (doctor permitted). Take time to remove yourself from work and the stress of everything. Taking a weekend trip with my husband and kids absolutely renewed my spirit and gave me the strength to prepare myself for the birth/procedure.
- Don’t forget to enjoy your pregnancy. That little person you are growing inside of you will one day want to hear about your journey. Revel in those kicks and hiccups, feeling them move is sometimes all the reassurance you need.

“No one else will ever know the strength of my love for you. After all, you are the only one who knows what my heart sounds like from the inside.” – Kristen Proby, Fight With Me

For Patients

To schedule an appointment or ask a question, call **832-826-4MFM** (4636)

For Providers

To refer a patient, complete the online referral form at

women.texaschildrens.org/health-professionals/refer-patient/maternal-fetal-medicine

To ask a question regarding the referral process or consultation, call the Provider Connect line **832-824-2273**

For Hospital-to-Hospital Transfers (including maternal transport)

To transfer a patient, call **832-824-5550** to speak with our on-call MFM specialist

Location

Texas Children's Pavilion for Women

6651 Main Street

Houston, TX 77030