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Ultrasound-Guided Intracavitary Methotrexate for Cornual (Interstitial) Pregnancy in India: Evidence, Practice Pathways, and Policy Enablers for a Minimally Invasive Approach

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Abstract

Background: Cornual (often used interchangeably with *interstitial*) pregnancy is a rare, high-risk ectopic implantation in the intramural segment of the fallopian tube. It accounts for roughly **2–4% of ectopic pregnancies** but carries a disproportionate risk of catastrophic hemorrhage and first-trimester maternal mortality if missed. In India, where maternal mortality continues to fall yet remains heterogeneous across states, early detection and equitable access to fertility-preserving treatments are public-health priorities. (PMC, Census India)

Objective: To synthesize global and Indian evidence on **ultrasound-guided intracavitary (intrasac) methotrexate (MTX) injection** for cornual/interstitial pregnancy, compare it with systemic MTX and surgery, and translate findings into **India-specific clinical, systems, and policy recommendations**.

Methods: A narrative synthesis (2020–2025 priority window) integrating **peer-reviewed studies, guidelines (FOGSI, RCOG, ISUOG, ESHRE), Indian government publications (MoHFW, SRS/NFHS, AB-PMJAY), press releases/industry reports**, and **educational podcasts/YouTube content**. Inclusion emphasized Indian data, high-quality reviews, and practical technique descriptions; older seminal sources were retained when necessary (e.g., RCOG Green-top No. 21). (FOGSI, RCOG, Oxford Academic, Census India, PMC)

Key findings:

1. **Effectiveness & safety:** Carefully selected, hemodynamically stable patients achieve **high success** with local MTX (often **~80–98%** in non-tubal series), with lower blood loss and fertility preservation compared with cornual resection. **Adjunct KCl** is used when embryonic cardiac activity is present. (SpringerOpen, BioMed Central, fertstert.org)
2. **Technique standardization:** Transvaginal ultrasound guidance, needle confirmation within the sac, optional aspiration, **25–50 mg MTX** into sac ± **KCl 2 mEq/mL** to arrest cardiac activity; serial β-hCG/US follow-up is essential to detect delayed rupture. (PMC, Radiology Key)

3. **Indian context: Access barriers** include rural–urban and wealth-related inequalities in ultrasound, and **PCPNDT-related operational constraints** that can inadvertently impede point-of-care ultrasound (POCUS) in emergencies. Programs like **PMSMA, LaQshya, SUMAN, AB-PMJAY** create enabling pathways for timely diagnosis and coverage of ectopic management. (Nature, PMC, PMSMA, National Health Mission, National Health Systems Resource Centre, National Health Authority)
4. **Implementation:** Hub-and-spoke models with **tele-ultrasound and handheld devices**, clear inclusion criteria, and standardized consent/monitoring can scale minimally invasive care while ensuring PCPNDT compliance. (Philips USA)

Conclusions: Ultrasound-guided intracavitary MTX is a **fertility-sparing, minimally invasive** option that should be incorporated into **India-tailored clinical pathways**, supported by training, regulated POCUS access, and AB-PMJAY package alignment. **Policy updates** to facilitate emergency ultrasound use while upholding sex-selection safeguards are pivotal.

Keywords: interstitial pregnancy; cornual pregnancy; ultrasound-guided methotrexate; intrasac injection; India; ectopic pregnancy management.

1. Introduction

Defining the entity and clarifying terminology. Interstitial pregnancy denotes implantation in the **intramural portion**of the Fallopian tube traversing the uterine myometrium; the term *cornual pregnancy* is sometimes used loosely, which can create confusion with **angular pregnancy** (a medial intrauterine corner implantation) or pregnancy in a rudimentary horn. Accurate differentiation matters because management and risks differ substantially. Diagnostic ultrasound features for interstitial pregnancy include: **empty uterine cavity**, eccentrically located sac >1 cm from the cavity, **thin myometrial/endomyo-metrial mantle** (commonly **<5 mm** threshold used), and the **"interstitial line sign"**—an echogenic line from the endometrium to the sac. (PMC, Radiopaedia)

> "The *interstitial line sign* has **high sensitivity (≈80%) and specificity (≈98%)** for interstitial pregnancy." (BioMed Central)

Globally, ectopic pregnancies account for **1–2%** of all pregnancies (higher with ART), and are the **leading cause of first-trimester maternal death**. Interstitial/cornual pregnancies represent **~2–4%** of ectopics but contribute disproportionately to hemorrhagic morbidity and **2–2.5% mortality**, given their myometrial location and rich vascular supply. (PMC)

Indian epidemiology and maternal-health backdrop. India's Maternal Mortality Ratio (MMR) has improved to **88 (2020–22)**, masking sharp state-level variation (e.g., lower in Kerala/Tamil Nadu; higher in parts of Central & Eastern India). Ectopic pregnancy—though uncommon—remains a meaningful contributor to first-trimester morbidity and maternal deaths (Indian series often estimate **~3.5–7.1%** of maternal deaths linked to ectopic causes). (Census India, ijrcog.org)

Indian hospital-based studies report ectopic **incidence per 1,000 pregnancies** ranging from **~2.9 to 18** across settings, reflecting demographic, referral, and detection differences. Interstitial/cornual cases are rarer within that subset but carry higher rupture and transfusion risks—emphasizing the need for **rapid diagnosis** and **fertility-sparing options** in stable patients. (Scholars Middle East Publishers, ijogr.org)

ART and risk profile. Expanding access to infertility services and ART in India is positive but entails vigilance: ART is associated with a higher ectopic (and heterotopic) risk, and several reports note **increased interstitial/heterotopic presentations** in IVF cohorts. Indian and regional data (and broader literature) corroborate this trend, necessitating **high-quality early ultrasound** in early post-transfer follow-up. (PMC, European Medical Journal)

Why focus on ultrasound-guided intracavitary MTX? Traditional management for cornual pregnancy was surgical (cornuostomy/resection or laparotomy in emergencies). Minimally invasive alternatives include **systemic MTX**, **local/intrasac MTX** (with or without **KCl** if cardiac activity is present), and **adjunct uterine artery embolization** in high-bleeding-risk scenarios. Over two decades, **local MTX** has emerged as an effective, fertility-preserving option for **carefully selected, hemodynamically stable** patients—particularly valuable in India, where **future fertility** is a central consideration for many families and **operating-room/IR capacity is uneven**. (SpringerOpen, fertstert.org)

Equity and access in India. The promise of early, minimally invasive care must be weighed against **real-world access**: NFHS analyses show persistent **socioeconomic and geographic inequalities** in ANC content, with **ultrasound among the most unequal services** (wealth gap ~**33 percentage points**; education gap ~30 points). National initiatives—**PMSMA** (fixed-day quality ANC), **LaQshya** (labour room quality), and **SUMAN** (zero-denial respectful care)—aim to standardize and elevate maternal services nationally, while **AB-PMJAY** packages cover surgical and medical ectopic management, improving affordability. (Nature, PMSMA, National Health Mission, National Health Authority)

Regulatory realities. India's **PCPNDT Act** (1994; amended) is critical for preventing sex selection and protecting girls, but operationalization can **unintentionally restrict bedside ultrasound use** by non-radiology clinicians in emergency pathways (e.g., ED or peripheral units)—a barrier repeatedly highlighted by emergency and maternal-health practitioners. Modernizing **process clarity and training pathways** can uphold PCPNDT goals while enabling **timely, lifesaving ultrasound** for suspected ectopic pregnancy. (India Code, Lippincott Journals)

Problem statement & objectives. This article addresses a practical question for India: *When and how should ultrasound-guided intracavitary MTX be deployed for suspected or confirmed cornual (interstitial) pregnancy to optimize maternal safety and future fertility, and how can India's systems and policies enable its equitable delivery?* We:

- Synthesize **biological/technical evidence** and outcomes for local MTX;
- Map **India-specific sociocultural and systems barriers**;
- Identify **gaps** in current responses; and
- Propose **innovations and policy enablers** to scale a safe, minimally invasive approach.

Scope and limitations. Evidence is predominantly case reports/series, retrospective cohorts, and cross-specialty reviews; randomized trials are scarce. Where high-quality Indian data were limited, we extrapolate cautiously from robust global sources and align with **FOGSI/RCOG/ISUOG** guidance. (FOGSI, RCOG)

Methodology

Research design. A targeted narrative review with **India-first** lens. We prioritized **2020–2025** publications and resources; older seminal papers/guidelines were included to clarify definitions and technique evolution.

Databases & sources. We searched **PubMed/Medline (via NIH/PMC), BJOG/RC-OG, ACOG, ISUOG, ESHRE, JOGC, Fertility & Sterility**, and Indian journals (**J Obstet Gynaecol India; IJRCOG; IJOGR**). We included **policy/government** sites (MoHFW, NHM/NHA/AB-PMJAY, SRS/NFHS), and **press releases/industry reports** on portable ultrasound adoption. We also reviewed **educational YouTube/playlist lectures** (ISUOG, radiology teaching channels) and **podcasts** (emDOCs; India-based hospital podcast) to triangulate practice insights and training messages. (Census India, PMSMA, National Health Authority, Philips USA, YouTube, emDocs)

Search strategy (illustrative terms).

"interstitial OR cornual pregnancy" AND ("ultrasound-guided" OR "transvaginal") AND ("methotrexate" OR "intrasac" OR "intracavitary" OR "local injection"); "KCl instillation"; "uterine artery embolization AND interstitial"; "FOGSI ectopic guideline"; "PCPNDT ultrasound emergency"; "PMSMA guideline ultrasound"; "AB-PMJAY package ectopic."

Inclusion/exclusion.

- **Include:** peer-reviewed studies, systematic reviews, guidelines, Indian case series/observational studies, official government bulletins/policies, credible industry/press releases, and educational videos/podcasts with clear expert provenance.
- **Exclude:** opinion pieces without data; redundant reports; low-credibility webpages; non-English unless providing India-specific policy facts.

Data synthesis. We abstracted **diagnostic criteria**, **patient selection**, **technique parameters** (dose, route, adjuncts), **outcomes** (success, time to β-hCG resolution, rupture/hemorrhage, fertility), **comparators** (systemic MTX; laparoscopy; UAE), and **implementation factors** (training, equipment, costs, coverage). **India-specific** themes (access, law/policy, program coverage) received special emphasis.

Quality & limitations. The rarity of interstitial pregnancy yields small cohorts; **selection bias** and **publication bias**likely. Where numeric ranges are broad, we avoid over-precision and cross-reference **guidelines**. For Indian statistics, **SRS/NFHS** and peer-reviewed analyses were prioritized; state-level heterogeneity is acknowledged. (Census India, PMC)

Timeline. Literature through **August 15, 2025** was screened; 2020–2025 sources emphasized to reflect current Indian programs and technology diffusion.

Discussion

1. Biological & Technical Factors: What the Evidence Shows

Pathophysiology & risk. Interstitial implantation lies within the myometrium; **vascular anastomoses** from uterine and ovarian arteries confer major hemorrhage risk upon rupture. ART, prior tubal surgery, and pelvic infections increase risk; heterotopic interstitial pregnancies, though uncommon, are increasingly recognized in ART cohorts. (BioMed Central, Frontiers)

Diagnosis. Early **transvaginal ultrasound (TVUS)** and serial **β-hCG** are central. Interstitial pregnancy is suggested by **eccentric sac** with **thin myometrial mantle** (typically **<5 mm highly suspicious**) and the **interstitial line sign**; distinction from angular pregnancy (usually **>5 mm mantle**; intra-cavity communication) is crucial because angular pregnancies can sometimes be managed expectantly. MRI can assist when TVUS is equivocal. (Radiopaedia, ScienceDirect)

> "Transvaginal ultrasound is the **primary diagnostic tool** for interstitial ectopic pregnancy." (isuog.org)

Why local (intracavitary) MTX? Systemic MTX is effective in many tubal ectopics but **interstitial cornual** lesions are deeply intramural and richly perfused; local dosing achieves **higher tissue concentrations** with lower systemic exposure, potentially **improving efficacy** and **reducing toxicity**. Reviews report **local MTX success** commonly **>80%** and up to **~97–98%** in select series of non-tubal ectopics; surgical success is high as well but with greater tissue disruption and future uterine rupture concerns (post-cornual resection). (SpringerOpen)

Technique—what "good" looks like.

- **Patient selection:** hemodynamically stable; **no signs of rupture**; sac size typically **≤3–4 cm**, absent or manageable cardiac activity; acceptable labs and **no MTX contraindications** (renal/hepatic dysfunction, breastfeeding without counsel, etc.). Cardiac activity is **not an absolute contraindication** to local therapy if **KCl is used**. (RCOG)
- **Ultrasound guidance:** Prefer **transvaginal** route for precision; **transabdominal** can be used in experienced hands. Confirm needle tip **within the sac**; aspirate a small amount of **amniotic fluid** to confirm position and reduce volume; inject **MTX 25–50 mg** (common practice) into sac ± peritrophoblastic area. If fetal cardiac activity is present, inject **KCl (2 mEq/mL; typically 2–5 mL)** to achieve asystole, then instill MTX. (PMC, Radiology Key)
- **Dosing nuances:** Some protocols use **1 mg/kg** MTX in situ; others split between **fetal pole (25 mg)** and sac wall (25 mg). In **Indian reports** of non-tubal ectopics, **50 mg/m²** intra-sac MTX has been used with close β-hCG monitoring (day 4 and 7). **Leucovorin rescue** is typically unnecessary for single local dosing but may be used if combined with systemic multi-dose regimens. (ScienceDirect, fertstert.org, PMC)

- **Monitoring:** β-hCG on **day 4 and 7** to assess decline; weekly until negative. **TVUS** to document involution. **Counsel about delayed rupture**—rare but reported even during β-hCG decline; strict return precautions and low threshold for admission if pain escalates. (PMC)

Effectiveness and outcomes. Evidence synthesizing nontubal ectopics (including interstitial) shows **intralesional MTX**success **~76–92%**, with mean β-hCG normalization around **9 weeks** and sonographic resolution over **months**—consistent with trophoblastic involution kinetics. Multiple reviews (and RCOG/ISUOG guidance) accept **local MTX** as **first-line** in appropriate patients, with **surgery** (often laparoscopic cornuostomy/resection) for hemodynamic instability, failed medical therapy, or large/late gestations. (BioMed Central, RCOG)

Fertility after local therapy. Data are limited but encouraging: conservative local approaches tend to **preserve uterine integrity**; subsequent **intrauterine live births** after local treatments (including combinations like UAE + MTX) are reported. Preconception counseling should address **recurrence risk** and **timing** of future conception. (Tjo Istanbul)

Risks & complications.

- **Delayed rupture/bleeding** (requires vigilance and patient education).
- **Incomplete resolution** requiring a repeat dose or conversion to surgery.
- **AV malformations** post-therapy are rare; a case report described **uterine AVM** after systemic MTX+mifepristone for interstitial pregnancy, resolved with UAE—underscoring the need for **Doppler surveillance** when bleeding persists. (MDPI)

Adjuncts & alternatives.

- **Uterine artery embolization (UAE)** as adjunct or salvage in bleeding risk; small series, including **India-reported cases**, show hemostatic benefit and fertility preservation. (PMC, ijrcog.org)
- **Combined systemic + local MTX** or **KCl + MTX** in live ectopics; **hysteroscopic** support in select centers; **laparoscopic** cornuostomy/resection where expertise exists. (PMC, BioMed Central)

Bottom line (technical): Ultrasound-guided local MTX is an **evidence-supported, fertility-sparing** option for **stable** cornual/interstitial pregnancies, with standardized technique and disciplined follow-up key to minimizing rupture and ensuring resolution.

2. Sociocultural Realities in India: Barriers & Lenses

Diversity and disparities. India's maternal-health landscape is marked by **regional heterogeneity** (Kerala/Tamil Nadu vs. parts of Central/East), **urban–rural divides**, and **socioeconomic gradients**. Analyses of NFHS-5 reveal that **ultrasound** during ANC remains **one of the most unequal services**, with pronounced **wealth and education gaps**, even as aggregate coverage improves. Families in rural, tribal, and low-resource settings may present later with ruptured ectopics. (Nature)

Cultural considerations. Decisions are embedded in **family/kinship structures**; **future fertility** often weighs heavily on treatment choices. Communicating diagnosis and options in **local languages**—using

plain terms for "*garbh ka thaila bachchedani ke kone mein laga hai*" (Hindi for a sac implanted in the uterine corner), or equivalent in regional languages—can reduce anxiety and improve consent quality.

ART and aspirations. As ART expands, patients may travel across states for treatment; **early post-transfer ultrasound**(often at 5–6 weeks) should be standardized to reduce missed interstitial/heterotopic pregnancies, with clear **referral pathways** for minimally invasive therapy where indicated. (PMC)

Regulatory climate around ultrasound. The **PCPNDT Act** is essential for gender equity but its **operational interpretation** can limit **POCUS** adoption in emergency and peripheral settings—deterring clinicians from scans while awaiting radiology services, potentially delaying ectopic detection. Professional bodies and policymakers can **clarify permissive pathways** (e.g., **credentialed emergency obstetric POCUS** for **time-critical, non-sex-determination** scans) with monitoring/reporting safeguards to uphold the law. (India Code, Lippincott Journals)

Trust & stigma. Miscarriage/ectopic experiences may carry **stigma**; empathetic counseling, **partner involvement**, and linkage to **mental-health** and **peer support** (including credible podcasts and patient education videos) can improve adherence to serial follow-up, which is critical after local MTX. (Pace Hospital)

3. Current System Response & Gaps in India

Guidelines & pathways. FOGSI GCPR (2020) supports MTX-based medical management in stable ectopic pregnancy with standard criteria (low β-hCG, small sac, no rupture), aligning with **RCOG** recommendations for non-tubal sites where local measures may be preferred. However, many centers still default to systemic MTX or surgery due to **skills/equipment gaps** for precise intra-sac injections. (FOGSI, RCOG)

> "**Single-dose MTX** is preferred over multi-dose due to toxicity concerns; surgical management for those unfit for medical/expectant pathways." (FOGSI GCPR) (FOGSI)

Programs & coverage.

- **PMSMA** (fixed-day ANC on the 9th) has expanded access to **quality antenatal services**—including ultrasound where indicated—improving early detection potential. **LaQshya** and **SUMAN** bolster facility readiness and "zero-denial" maternity care. (PMSMA, National Health Mission, National Health Systems Resource Centre)
- **AB-PMJAY Health Benefit Packages (HBP)** list **"Medical management of ectopic pregnancy"** and **laparoscopic tubal surgeries (including ectopic)**—supporting affordability of both medical and surgical options in empanelled hospitals. Though packages are not site-specific, they provide an **opening to include local/intrasac MTX** in practice. (National Health Authority)

Service-delivery gaps.

- **Ultrasound availability** varies; **rural and district hospitals** may lack **TVUS probes** or operators trained in **interventional ultrasound**. Wealth and education gradients in ultrasound uptake persist. (Nature)
- **Training & credentialing** for **ultrasound-guided procedures** (including intra-sac injections) are not uniformly embedded in OBGYN residency across institutions; interdepartmental collaboration with **radiology** and **interventional radiology** is variable.
- **Referral systems** are ad hoc; **delays** occur in moving stable patients to **tertiary centers** capable of local MTX/UAE.
- **Data systems** rarely capture **site-specific ectopic management** (e.g., interstitial vs tubal) or **route of MTX** (local vs systemic), hindering real-time quality improvement.

Regulatory uncertainty for POCUS. Emergency physicians and OBGYNs cite **legal anxieties** under PCPNDT that discourage POCUS for life-threatening gynecologic emergencies; clearer guardrails and rapid **e-logbook/consent** tools could reconcile **compliance** with **clinical urgency**. (Lippincott Journals)

4. Innovative Solutions & Best Practices for India

A. Clinical & procedural standardization

1. **Eligibility checklist (cornual/interstitial, stable):**
    - Hemodynamically stable; **no rupture**; Hb adequate.
    - TVUS criteria consistent with interstitial pregnancy; **sac ≤3–4 cm**.
    - β-hCG: lower success as levels rise, but **local MTX remains effective** in select cases; consider **KCl** if **FHR present**.
    - No MTX contraindications; **reliable follow-up** ensured (phone, ASHA linkage). (SpringerOpen)
2. **Technique protocol (TVUS-guided):**
    - Consent (including **fertility, rupture risk**, potential need for surgery/UAE).
    - **Needle path planning**; confirm tip **inside sac**, aspirate; instill **25–50 mg MTX** ± targeted fetal-pole dose; if cardiac activity, **KCl 2–5 mL (2 mEq/mL)** until asystole; gentle compression; brief observation.
    - **β-hCG day 4 & 7**, then weekly; **TVUS** to monitor involution; explicit **return precautions**. (PMC, Radiology Key)
3. **When to escalate:** increasing pain, hemodynamic changes, **plateau/rise** of β-hCG → **repeat local MTX** or **systemic MTX** or **laparoscopic** management; consider **UAE** if bleeding risk escalates or vascularity is high. (fertstert.org)

B. Workforce, training, and culture

- **Short courses & fellowships** for OBGYNs in **interventional obstetric ultrasound**, run jointly by **FOGSI–IRIA–ISUOG**, with **simulation-based** needle guidance and **PCPNDT-compliant**

documentation workflows. Leverage high-quality **ISUOG video teaching** and **radiology lectures** on interstitial pregnancy ultrasound for continued learning. (YouTube)

- **Multidisciplinary drills**: OBGYN + anesthesia + IR for catastrophic hemorrhage scenarios from interstitial pregnancy, including **massive transfusion** and **UAE activation**.

C. Technology and access

- **Handheld ultrasound** deployment (Lumify/Vscan class) in **district hospitals** with tele-mentoring ("**see-one with supervision**" via secure video), especially in **North-Central belts** with higher MMR; ensure **TVUS capability** in hubs. Align with government mobile-health and **MMU** strategies to shorten time-to-diagnosis while maintaining compliance. (Philips USA, National Health Mission)
- **Tele-ultrasound networks** linking **CHCs/SDHs → District/Medical College hubs**; shared **checklists**; **remote case review** before intrasac injection; standardized **digital consent** and **procedure logs** (meeting PCPNDT requirements). (India Code)

D. Financing & policy enablers

- **AB-PMJAY**: Ensure **coding clarity** so that **local/intrasac MTX** for ectopic pregnancy is recognized as **medical management** under existing packages; hospitals can claim **day-care** or short stay tariffs. Include **disposable needles/TVUS guidance** in package inclusions to avoid out-of-pocket spending. (National Health Authority)
- **Maternal-health quality initiatives**: Integrate **cornual/interstitial pregnancy bundles** into **LaQshya** and **SUMAN** dashboards (time-to-ultrasound, time-to-definitive therapy, hemorrhage outcomes). (National Health Mission, National Health Systems Resource Centre)

E. Patient-centric communication

- Provide **bilingual** (local + English/Hindi) handouts explaining the diagnosis, the **minimal-invasive** option ("*sui se injection se thaila sukha dena*"), warning signs, and contact numbers.
- Offer **counseling** on **future conception**, suggested inter-pregnancy interval, and **early TVUS** in the next pregnancy (around 5–6 weeks). **Peer support resources** (credible podcasts/videos) can improve follow-through. (Pace Hospital)

F. Research & data systems

- Launch **FOGSI multi-center registry** for **cornual/interstitial pregnancy**, capturing **route of MTX** (local vs systemic), **adjuncts (KCl/UAE)**, **β-hCG trajectories**, **complications**, and **future fertility**—with **state-wise** dashboards to reveal regional gaps and improvement targets.

Conclusion

Synthesis. Cornual (interstitial) pregnancy is rare yet high-risk. **Ultrasound-guided intracavitary MTX** is a **credible, fertility-sparing, minimally invasive** option for **hemodynamically stable** patients when diagnostic criteria are met and procedural expertise exists. The technical approach—**precise TVUS needle placement**, **25–50 mg intra-sac MTX**, **KCl**for cardiac activity, with rigorous β-hCG/US follow-up—has demonstrated **high success** (often **~80–98%** across nontubal series) while averting surgical morbidity in many cases. (SpringerOpen, BioMed Central)

Indian imperatives. India's progress on maternal mortality is notable, yet **state-level inequalities** and **ultrasound access gaps** persist. Regulations intended to prevent sex selection can **unintentionally** hamper **time-critical POCUS** in emergency gynecology. National programs—**PMSMA, LaQshya, SUMAN**—and **AB-PMJAY** financing provide a strong scaffold to **standardize early diagnosis**, **cover medical/surgical care**, and **reduce catastrophic spending**. Aligning these pillars with **clearer professional pathways** for **PCPNDT-compliant emergency ultrasound** will save lives and preserve fertility. (Census India, Nature, Lippincott Journals)

Implications for stakeholders.

- **Clinicians/teams:** Adopt **eligibility checklists**, **standardized local-MTX protocols**, and **shared care** with radiology/IR. Practice **culturally sensitive, multilingual counseling** with explicit rupture precautions.
- **Hospital leaders:** Ensure **TVUS capability**, **disposables**, and **simulation-based training**; develop **rapid referral**pathways and **UAE linkages**.
- **Policymakers: Clarify PCPNDT** provisions for emergency, non-sex-determination ultrasound by trained clinicians; **signal approval** of local MTX within **AB-PMJAY** medical management packages and integrate **cornual/interstitial bundles** into **LaQshya/SUMAN** indicators.
- **Researchers/FOGSI:** Establish a **national registry** and **prospective cohorts** to refine selection thresholds (β-hCG, sac size, vascularity), compare **local vs systemic MTX**, and quantify **fertility outcomes** in Indian populations.
- **Communities/ASHA network:** Encourage early ANC enrollment, **early pregnancy ultrasound**, and **prompt care-seeking** for first-trimester pain/bleeding.

Policy recommendations (priority list):

1. **Issue operational guidance** enabling **credentialed emergency POCUS** for suspected ectopic pregnancy within **PCPNDT** safeguards. (India Code, Lippincott Journals)
2. **Codify local/intrasac MTX** as a recognized **AB-PMJAY** sub-package with **TVUS guidance** and consumables covered. (National Health Authority)
3. **Scale TVUS capacity** (including handheld solutions) at district hospitals; enable **tele-ultrasound mentoring** and **simulation training** with FOGSI/IRIA/ISUOG collaboration. (Philips USA)
4. **Embed cornual/interstitial metrics** (time to diagnosis/definitive therapy; transfusion; fertility outcomes) in **LaQshya/SUMAN** quality dashboards. (National Health Mission, National Health Systems Resource Centre)

With these levers, India can **bridge global knowledge and local realities**, ensuring that women from **Kashmir to Kanyakumari**, **Kutch to Kohima**, in both **metros and aspirational districts**, access **timely, fertility-preserving** care for this uncommon but dangerous condition.

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(Additional supportive citations are embedded contextually throughout.)