CAPE News

Newsletter of The Indian Society for Pediatric and Adolescent Endocrinology (ISPAE)

MARCH 2026
Volume 30 - Issue 1

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PEDIATRIC GYNAE ENDOCRINOLOGY

Next Issue: "Environment, Spirituality & Pediatric Endocrinology"

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EDITOR'S MESSAGE

Dear Readers,

Greetings from the CAPE News Editorial team.

It is a privilege to present this issue of CAPE News, which is now entering its **30th year**! This has indeed been an exciting journey so far, from the small beginnings of a 6-page, photocopied attempt to keep a tiny subchapter of IAP with a few members connected to each other, to what it is now - a colorful newsletter jam packed with succinct knowledge and news of a vibrant, ever growing society! In keeping with our increasing "maturity", the theme of our next issue is somewhat different - an experimental attempt to look beyond hormones to "Environment, Spirituality & Pediatric Endocrinology". We look forward to your thoughtful contributions.

The current issue focuses on the complex intersection of pediatric gynecology and endocrinology. As our field increasingly demands a multidisciplinary approach, we explore perspectives on and nuances in the treatment of polycystic ovary syndrome (PCOS), addressing its metabolic drivers; Abnormal Uterine Bleeding, fertility and biochemical and hormonal assessment needed for the same. As research evolves, we must stay committed to evidence-based, compassionate care that prioritizes the long-term reproductive health of our young patients.

I extend my deepest gratitude to the authors for their "learning pearls" and to our members for their continued academic rigor. We hope these insights inspire your practice and foster further collaboration within our vibrant community.

Keep learning and shining!

We will be glad to have suggestions/ feedback for improvements, at editor.capenews@gmail.com.

Regards,
Nikhil Lohiya
Team CAPE News

ISPAE PRESIDENT- MESSAGE

Dear Colleagues and Friends,

I warmly congratulate the CAPE News Editorial Board for an excellent March 2026 issue. This edition is scientifically rich, clinically useful, and a pleasure to read. The focus on pediatric and adolescent gynecologic endocrinology has been developed with depth and balance, and the issue brings together reviews, practical updates, case-based learning, member activities, and reports from Society events in a way that serves the full breadth of our readership.

I am delighted to note the success of the ISPAE meeting in Nagpur, which delivered vibrant scientific exchanges, thoughtful debates, and strong trainee participation. The case-based discussions and methodology-focused sessions brought clinicians and researchers into the same room, helping translate evidence into everyday decisions. My sincere thanks to the organizers, faculty, and volunteers whose meticulous efforts ensured a program that was rigorous, collegial, and relevant to Indian practice.

At the Society level, the ISPAE CARE initiative continues to move forward at pace. “CARE” is our effort to distil evidence into concise, context-appropriate clinical algorithms for pediatric endocrinology—designed for point-of-care use so that busy clinics, teaching units, and remote practices can confidently adopt standardized, high-quality pathways.

Our guideline and statement pipeline is robust. The DSD guideline emphasizes multidisciplinary, family-centered care across evaluation, communication, and longitudinal support. The Congenital Hypothyroidism guideline addresses age-specific thresholds, rational use of imaging and laboratory investigations, and nuanced management. A suite of Type 1 Diabetes statements is being finalized to provide crisp guidance on diagnosis, insulin therapy, technology-enabled monitoring, psychosocial care, school and sports participation, and transition to adult services. In parallel, our working groups are strengthening collaboration, educational activity, and consensus development across the subspecialty.

Looking ahead, CAPE News will remain a key channel for sharing progress, inviting participation, and amplifying good work from across the country. I encourage all members—especially fellows and early-career colleagues—to contribute clinical pearls, brief reviews, and data snapshots that can sharpen day-to-day practice. Your voice strengthens our collective mission.

Warm regards,

Dr Anurag Bajpai- on behalf of ISPAE 2025-2026

Welcome New Members

Life Members	Associate Life Members	
• Kanupriya Kundu- Hisar	• Hema Vohra- New Delhi	• Manjusha Barve- Sambhajinagar
• Animesh Debbarma- Tripura	• Fathima Noora- Thrissur	• Parul Sharma- Dehradun
	• Ramya Rajagopal- Bengaluru	• Kalyan More- Sambhajinagar
	• Japinder Kaur Gill- Mohali	• Jigyasa Kaur- Dehradun
	• Pooja Dusad- Sambhajinagar	• Beemajan Yusuf- Bengaluru

WINNER- December 2025 Quiz: CONGRATULATIONS!!

Dr Ayush Agarwal

3rd year Endocrine Resident, IPGMER, Kolkata

REVIEW OF 2025 INTERNATIONAL EVIDENCE-BASED RECOMMENDATIONS FOR POLYCYSTIC OVARY SYNDROME IN ADOLESCENTS – A DERIVATION FROM 2023 INTERNATIONAL EVIDENCE-BASED GUIDELINE FOR PCOS

Ajinkya Patil, *Pediatric Endocrinologist, Hormocare Clinic, Jalgaon*

Applying adult PCOS diagnostic criteria to pediatric patients risks overdiagnosis because normal variations in the immediate post-menarcheal years often resemble PCOS. Conversely, disregarding diagnostic features can result in delayed intervention, allowing the unchecked progression of long-term cardiometabolic and psychological sequelae.

Addressing this, Peña et al. recently published the "International evidence-based recommendations for polycystic ovary syndrome in adolescents" in BMC Medicine. Derived from the comprehensive 2023 Guideline, these recommendations utilize the rigorous Appraisal of Guidelines for Research and Evaluation (AGREE-II) methodology and the Grading of Recommendations, Assessment, Development, and Evaluation (GRADE) framework across 55 clinical questions. This review synthesizes the key findings, highlighting Evidence-Based Recommendations (EBRs), Consensus Recommendations (CRs), and Practice Points (PPs).

Screening, Diagnosis, and Risk Assessment

The updated international consensus stipulates that an affirmative diagnosis of adolescent PCOS necessitates the co-existence of both ovulatory dysfunction and clinical or biochemical hyperandrogenism, strictly following the meticulous exclusion of phenocopies and other endocrinopathies.

Ovulatory Dysfunction (Menstrual Irregularities)

Given the prolonged physiological maturation of the hypothalamic-pituitary-ovarian axis, it is imperative that menstrual irregularity is defined strictly in relation to gynecological age (the duration since menarche).

- **CR**: Irregular menstrual cycles are defined as:
  - Normal in the first-year post-menarche as part of the pubertal transition.
  - 1 to <3y post-menarche: cycles <21 or >45 days.
  - 3y post-menarche to perimenopause: cycles <21 or >35 days, or <8 cycles per year.
  - >1y post-menarche: >90 days for any one cycle.
  - Primary amenorrhea: absence of menarche by age 15y or >3y post-thelarche (breast development).
- **PP**: The mean age of menarche may differ across distinct populations.
- **PP**: Ovarian dysfunction can still occur with apparently regular cycles; if anovulation needs to be confirmed, serum progesterone can be measured.
- **PP**: The optimal timing of assessment should be discussed with the patient and guardians, considering psychosocial factors.

Clinical Context & Evidence Base: The reproductive axis undergoes protracted maturation. However, by the third post-menarcheal year, 95% of cycles achieve an average adult length of 28 days. Using these evidence-based timeframes for defining irregularities ensures that normal pubertal development is not mistakenly treated as a medical condition.

Biochemical and Clinical Hyperandrogenism

To satisfy the hyperandrogenism criterion, clinicians must objectively establish either clinical or biochemical androgen excess.

- **EBR**: Healthcare professionals (HCP) should use total and free testosterone to assess biochemical hyperandrogenism; free testosterone can be estimated by calculating the free androgen index (FAI).
- **EBR**: Laboratories should use validated, highly accurate tandem mass spectrometry assays for measuring total testosterone.

- **EBR**: Direct immunoassays must be avoided for assessing free testosterone due to notoriously poor sensitivity and precision.
- **EBR**: If testosterone is not elevated, measuring androstenedione and dehydroepiandrosterone sulfate (DHEAS) can be considered, noting poorer specificity.
- **CR**: A comprehensive history and physical examination should be completed, focusing on severe acne and hirsutism. A modified Ferriman-Gallwey (mFG) score of ≥ 4 to 6 indicates hirsutism.
- **PP**: In most adolescents, androgen levels reach adult ranges by 12-15y of age.
- **PP**: If a patient is on a combined oral contraceptive pill (COCP), it should be withdrawn for a minimum of three months prior to biochemical assessment, to mitigate sex hormone-binding globulin interference.

Clinical Context & Evidence Base: Supporting meta-analyses demonstrate that calculated free testosterone and the FAI yield the highest diagnostic sensitivity (80.3% and 80.2%) and specificity (93.3% and 86.4%) for PCOS-related hyperandrogenism. Total testosterone and androstenedione demonstrate lower sensitivity (approximately 70%) and specificity (75-85%). Clinically, mild acne is prevalent in normal puberty; therefore, only severe acne reliably indicates hyperandrogenism. Furthermore, Ludwig or Olsen visual scales may be used for assessing female pattern hair loss, albeit rare in adolescents.

Ultrasound and AMH

A significant change in diagnostic practice is the firm contraindication of pelvic ultrasonography and anti-Müllerian hormone (AMH) testing during adolescence.

- **EBR:** AMH should not be used in adolescents.
- **PP:** There are no definitive criteria to define PCO morphology (PCOM) on ultrasound in adolescents; hence, it is not recommended.

Clinical Context & Evidence Base: Robust normative imaging data illustrate a rapid physiological expansion in ovarian volume and follicular density throughout adolescence, peaking in early adulthood at approximately 20y of age. Due to this dynamic morphological state, superimposing adult PCOM definitions onto adolescent ovaries is fundamentally flawed. Neither marker should be utilized for diagnosis until an individual is at least 8y post-menarche, representing reproductive axis maturity.

Formalizing the "At Risk" Clinical Cohort

- **PP**: Adolescents who have features of PCOS but do not meet the full diagnostic criteria (presenting with either discrete ovulatory dysfunction or hyperandrogenism alone) should be considered at increased risk.
- **PP**: Reassessment is advised at or before full reproductive maturity, 8y post-menarche. This includes adolescents with persisting features or significant weight gain.

Clinical Context & Evidence Base: This taxonomic distinction is highly functional, circumventing premature assignment of a chronic label and mitigating psychosocial burden. It mandates necessary longitudinal surveillance and symptom management.

Cardiometabolic Features

The guidelines reinforce the conceptualization of PCOS as a systemic disorder.

- **EBR**: Regardless of age and baseline body mass index (BMI), women with PCOS have an amplified risk for impaired fasting glucose, impaired glucose tolerance, and type 2 diabetes.
- **EBR**: Glycemic status must be assessed at diagnosis in all adults and adolescents with PCOS.
- **PP**: First-degree relatives should also be aware of their increased risk of diabetes and the need for regular glycemic assessment.

Clinical Context & Evidence Base: Although the 75g oral glucose tolerance test remains the most reliable method for adults, there is a significant absence of direct evidence assessing dysglycemia testing exclusively in adolescents with PCOS. As such, no particular testing algorithm can presently be recommended for this population over others.

Psychological Features

- **EBR:** HCPs should screen for depression in all adolescents with PCOS using regionally validated screening tools.
- **EBR:** Clinicians should be aware of the high prevalence of anxiety and screen accordingly.
- **EBR:** Features of PCOS negatively impact body image.
- **EBR:** Eating disorders and disordered eating should be actively considered, regardless of weight, especially in the context of lifestyle interventions.

Clinical Context & Evidence Base: Adolescents with PCOS face a significant mental health burden. Systematic reviews—including six studies with 1,098 ado0lescents—show up to a fourfold increase in depression among those with PCOS compared to control peers. Although anxiety is much more common in adults with PCOS (based on a meta-analysis of 27 studies), this association has not been statistically confirmed in the smaller adolescent group studied (3 studies involving 455 adolescents). Similarly, current limited research has not found higher rates of negative body image or eating disorders in adolescents with PCOS compared to controls. Given the scarcity of pediatric data, strong psychological connections in adults, and the already high prevalence of these issues among all teens, proactive mental health screening remains essential.

Management of Nonfertility Features

Lifestyle Management

- **EBR:** Lifestyle interventions (diet, exercise, behavioral) are recommended for all adolescents with PCOS to optimize metabolic health, including central adiposity and lipid profiles.
- **EBR:** There is a lack of evidence to support any specific diet composition over another.
- **EBR:** There is a lack of evidence to support any specific type or intensity of exercise over another.
- **CR:** Adolescents should aim for at least 60 minutes of moderate-to-vigorous physical activity daily, including muscle and bone strengthening three times per week.
- **PP:** In those who are not overweight, the focus should remain on a healthy lifestyle and the prevention of excess weight gain.

Clinical Context & Evidence Base: The obesogenic environment increases the risk of weight gain among adolescents. As current evidence does not identify a particular dietary or exercise strategy as most effective, interventions are recommended to be sustainable, tailored to individual preferences, and inclusive of family involvement.

General Principles

- **PP: Individual values and preferences:** It is crucial to understand these before selecting interventions.
- **PP: Pharmacological treatments:** Many are evidence-supported but lack specific regulatory approval for PCOS.
- **PP: Informed consent:** Clinicians must inform patients about the 'off-label' status of medications, potential side effects, and uncertainties.
- **PP: Advocacy:** HCPs should advocate for regulatory bodies to formally recognize these treatments for PCOS.

Combined Oral Contraceptive Pills (COCPs)

- **EBR:** COCPs could be considered in adolescents at risk or with a clear diagnosis of PCOS for managing hirsutism and/or irregular menstrual cycles.
- **EBR:** General population guidelines should be considered when prescribing COCPs.
- **EBR:** COCPs should be preferred over metformin for the management of hirsutism and irregular cycles.
- **EBR:** 35 µg ethinyl estradiol plus cyproterone acetate should be reserved as second-line therapy due to venous thromboembolic risks.
- **PP:** Natural estrogen preparations and the lowest effective estrogen doses (20-30 µg of ethinyl estradiol or equivalent) are recommended to balance efficacy and metabolic risk profiles.

Clinical Context & Evidence Base: Findings from ten studies involving 420 adolescents indicate that COCPs are worth considering for treating hirsutism and menstrual irregularities in those with or at risk of PCOS. Additionally, analysis of four studies (142 adolescents) shows that COCPs are favored over metformin for these issues. In adults with a BMI under 30 kg/m², combining COCPs and metformin provides only limited additional benefits, and currently, there is no available data on this combination for adolescents.

Metformin

- **EBR:** Metformin alone could be considered for cycle regulation in adolescents, acknowledging limited evidence.
- **EBR:** Metformin could be prioritized over COCPs specifically for metabolic indications in PCOS.
- **PP:** Start at a low dose (500 mg increments every 1-2 weeks) with a suggested maximum daily dose of 2 g in adolescents.
- **PP:** Long-term use may be associated with low vitamin B12 levels, necessitating periodic monitoring.

Clinical Context & Evidence Base: Metformin addresses the core metabolic derangements of PCOS, including insulin resistance, which can be present in adolescents regardless of BMI.

Antiandrogen Medications

- **EBR:** In combination with effective contraception, anti-androgens could be considered to treat hirsutism if there is a suboptimal response after a minimum of 6 months of COCP and/or cosmetic therapy.
- **PP:** Clinicians must heavily counsel regarding the severe teratogenic risks of under-virilization of male fetuses; effective contraception is mandatory.
- **PP:** Spironolactone (25-100 mg/day) appears to have lower risks of adverse effects. Cyproterone acetate (doses ≥ 10 mg) is not advised due to increased risk for meningioma.
- **PP:** Flutamide and bicalutamide carry an increased risk of severe liver toxicity.

Clinical Context & Evidence Base: The evidence supporting the use of anti-androgens in adolescents is limited: out of 26 studies, only 2 involved adolescent participants, where antiandrogens were used alongside two insulin sensitizers. As a result, anti-androgens are considered strictly as a step-up therapy for this age group.

Other Medications (Anti-Obesity Medications / Inositol)

- **CR:** Anti-obesity medications (AOMs), including liraglutide, semaglutide, and orlistat, could be considered in addition to lifestyle interventions for weight management per general guidelines.

- **PP:** Specific types, doses, or combinations of inositol cannot currently be recommended in adolescents with PCOS due to a lack of quality evidence.

Clinical Context & Evidence Base: The landscape of AOMs is rapidly evolving. However, because pediatric-specific PCOS evidence remains sparse, clinicians must extrapolate from general pediatric obesity guidelines; no specific adolescent PCOS recommendations have been made for AOMs. Similarly, the lack of adolescent efficacy trials firmly precludes recommending inositol preparations.

Cosmetic Therapies

- **EBR:** Mechanical laser and light therapies should be considered for reducing facial hirsutism and improving related depression and anxiety.
- **EBR**: A greater number of laser treatment sessions may be required for women with PCOS compared to idiopathic hirsutism.
- **CR:** Adverse effects are limited in the hands of experienced, qualified providers.

Models of Care and Transition

Continuity of care is particularly vulnerable during the transition from pediatric to adult healthcare systems, a period when the risks of obesity, dysglycemia, and depression often advance without adequate monitoring.

- **EBR**: Tailored information, education, and resources that are high-quality, culturally appropriate, and inclusive should be provided to all with PCOS.
- **EBR**: Information, education, and resources are a high priority for patients with PCOS, and should be provided in a respectful and empathic manner.
- **CR**: Models of care should prioritize equitable access to evidence-based primary care, with pathways for escalation to integrated specialist and multidisciplinary services as required.
- **EBR**: HCPs should employ shared decision-making and support patient agency or ability to take independent actions to manage their health and care.
- **EBR**: The importance of being knowledgeable about PCOS, of applying evidence-based practices when sharing news on diagnosis, treatment, and health implications, and of ascertaining and focusing on patient priorities, should be recognized.
- **PP**: A reproductive life plan and age-appropriate education on optimizing reproductive health is recommended in adolescents and women with PCOS, including healthy lifestyle, prevention of excess weight gain, and optimizing preconception risk factors.

Key Paradigm Shifts from Historical Guidelines

To support quick clinical adoption, the following points highlight new insights these guidelines provide over previous diagnostic approaches:

- **Absolute Exclusion of Ovarian Morphology (PCOM/AMH):** Unlike adult criteria, the guidelines forbid using PCOM ultrasound or AMH biomarkers for diagnosis before 8y post-menarche.
- **Implementation of the "At Risk" Taxonomy:** Formalizing an "at risk" category for single symptoms helps avoid early medicalization.
- **Chronologically Anchored Menstrual Thresholds:** Subjective interpretations of "irregularity" are replaced by strict time-based thresholds based solely on gynecological age.
- **Heightened Thresholds for Clinical Hyperandrogenism:** Recognizing the ubiquity of mild acne in normative puberty, diagnostic criteria now restrict clinical hyperandrogenism strictly to severe acne and standardized mFG scores of ≥ 4 to 6.
- **Mandatory Psychological Integration:** Driven by robust epidemiological data, routine psychological screening using validated tools is elevated to a primary, evidence-based mandate.
- **Stance on Emerging Therapeutics:** The guidelines definitively state that inositol cannot be recommended for adolescents, and leave AOMs to the purview of general population guidelines due to a lack of targeted evidence.

Conclusion

The International Evidence-Based Guideline criteria elucidated by Peña et al. represent a rigorous, developmentally calibrated paradigm shift. By firmly segregating adolescent diagnostic criteria from adult frameworks, prohibiting premature sonographic evaluations, and integrating comprehensive screening mandates, these guidelines optimize diagnostic precision and encourage a holistic, longitudinal care model for adolescents with PCOS.

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MINI REVIEW

APPROACH TO ABNORMAL UTERINE BLEEDING IN ADOLESCENTS


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Dr. Kochurani Abraham, *Consultant Pediatric Endocrinologist, Ankura Hospitals, Pune.*

Adolescents frequently experience menstrual problems such as irregular periods, painful menstruation, and prolonged or heavy menstrual bleeding. More than 70% of adolescent girls and young women report menstrual-related concerns.

Abnormal uterine bleeding (AUB) refers to bleeding from the uterine corpus that is abnormal in duration, volume, frequency, and/or regularity. The most common presentation of AUB in adolescents is puberty menorrhagia, defined as excessive bleeding occurring between menarche and 19y of age. Anovulation is responsible for 80% of cases of puberty menorrhagia. The time required for HPO-axis maturation following menarche, which is thought to result in ovulatory cycles and subsequent regular bleeding, varies between six months and three years. Due to ovulatory dysfunction, in the months following menarche, irregular, heavy and prolonged, and, rarely, skipped menses (for less than three months) may occur. AUB can significantly impair quality of life, interfere with school attendance, and restrict participation in sports and social activities. Although management strategies have evolved over time, the primary goals remain to reduce anxiety in affected adolescents and their families and to identify any underlying medical conditions that may have long-term health implications.

Heavy menstrual bleeding (HMB) is the most common presentation of AUB and is defined as excessive menstrual blood loss that negatively affects a woman's physical, social, emotional, or material quality of life. Clinical indicators include the need to change sanitary products more frequently than every 1–2 hours, need for double protection, recurrent soiling of clothing or bedding, and passage of clots larger than 2.5 cm in diameter.

Causes of AUB in Adolescents

Endocrine Causes	Anovulatory bleeding; Polycystic ovary syndrome (PCOS); Thyroid disorders; Hyperprolactinemia
Bleeding Disorders	Von Willebrand disease; Platelet dysfunction; Thrombocytopenia; Clotting factor deficiency
Pregnancy-Related Causes	Abortion; Ectopic pregnancy; First trimester bleeding; Gestational trophoblastic disease
Infections	Cervicitis; Endometritis; Sexually transmitted infections
Uterine Pathologies	Endometrial polyp; Leiomyoma; Adenomyosis; Malignancy
Medications	Anticoagulants; Depot medroxyprogesterone acetate (DMPA); Contraceptive implants; Intrauterine devices (IUDs)
Other Causes	Trauma; Foreign bodies

Clinical Evaluation:

A detailed menstrual history is essential, including age at menarche, cycle pattern, duration, and estimated blood loss (e.g., number of pads/tampons used). Sexual history, systemic illnesses, medication use, and personal or family history of bleeding disorders should be assessed. A history of excessive bleeding following surgery or dental procedures, easy bruising, epistaxis, or gum bleeding may suggest an underlying coagulopathy.

Physical examination should include Tanner staging of puberty, anthropometric measurements, and abdominal palpation, as well as evaluation for pallor, bruising, petechiae, goiter, and signs of hyperandrogenism. Examination of the external genitalia and lower vagina may be indicated to exclude local causes such as trauma, structural anomalies, masses, or discharge.

AUB in adolescents is often underrecognized and difficult to assess due to cycle variability, differing menstrual hygiene practices, and inconsistent reporting of bleeding patterns. Limited awareness of normal menstruation and reluctance to disclose symptoms further complicate evaluation. Although anovulation is common in this age group, underlying bleeding disorders should also be considered. Initial laboratory evaluation should include a pregnancy test, complete blood count with platelet count, peripheral smear, serum ferritin, prothrombin time, activated partial thromboplastin time, and fibrinogen levels. In patients with suspected bleeding disorders, further assessment for platelet function defects or von Willebrand disease (vWD) is indicated. The vWD panel should include measurement of von Willebrand factor (vWF) antigen, functional assays of vWF activity, and factor VIII activity. If a coagulopathy is identified or strongly suspected, referral to a hematologist is recommended for further evaluation and management.

Management:

- Most cases are managed as outpatients with reassurance about eventual ovulatory cycles.
- Treatment is indicated when AUB causes anemia or significantly affects quality of life.
- First-line therapy is usually medical; surgical interventions are reserved for refractory or complicated cases.
- Hospitalization is required for **acute, severe bleeding**, hemodynamic instability, or severe anemia.

1: Acute Severe Bleeding:

Criteria for hospitalization: Heavy bleeding (>1 pad/hour), signs of hypovolemia, orthostatic hypotension, or Hb < 8 g/dL.

Hormonal therapy (first-line)	High doses of estrogen can quickly repair the endometrial surface to achieve hemostasis, referred to as the 'endometrial repair method'. This approach uses intramuscular injection of estradiol benzoate (3–4 mg/day), divided 2-3 times/day, to quickly repair endometrial wounds and stop bleeding. Gradually reduce dosage to 1–2 mg/day after bleeding cessation. When the general condition improves and hemoglobin (Hb) levels are normal or nearly normal, progesterone is added for 10–14 days before stopping. The dose and type of progestin used should follow the endometrial shedding method. Or switch to Combined Oral Contraceptives (COC) -one tablet daily - until normal Hb levels are achieved. Oral estrogens are slow to act and not recommended during acute AUB hemostasis. Monophasic OCP 30–50 µg ethinyl estradiol: 1 pill every 6–8 hr until bleeding stops, then taper to daily. If unable to take orally: IV conjugated estrogen 25 mg every 4–6 hr.
Iron supplementation	Oral iron 60–120 mg/day; IV iron if oral intake inadequate. Continue for 3–6 months until ferritin normal.
Blood transfusion	Reserved for hemodynamic instability or symptomatic anemia. One-unit PRBC at a time, re-evaluate after each unit.
Adjunct therapies	Tranexamic acid 1300 mg orally (or 10 mg/kg IV) 8 hrly for up to 5 days. Desmopressin for vWD or platelet disorders. Avoid NSAIDs in suspected bleeding disorders.
Procedural interventions	Only if medical therapy fails: intrauterine balloon tamponade (e.g., Foley catheter), uterine evacuation if clot/decidual cast present. Surgical interventions (embolization, ablation, hysterectomy) are avoided to preserve fertility.

2: **Mild to Moderate bleeding:**

A. Observation- Appropriate if Hb is normal, and quality of life is unaffected.

B. First-line: Combined Oral Contraceptives (COCs)

- Use 30–35 µg ethinyl estradiol preparations.
- Start: 1 tablet every 8–12 hours.
- After bleeding stops (3–7 days): reduce to 1 tablet every 12 hours, then taper as needed.
- Maintain dose sufficient to prevent bleeding until Hb improves to tolerate withdrawal bleeding.
- Reassure patients and parents: COCs do not affect final adult height or future fertility in adolescents.

C. Progestin Therapy (If COCs Contraindicated/ Not Tolerated): Indicated in patients with contraindications to estrogen (e.g., migraine with aura, SLE, thromboembolism, estrogen-dependent tumors, severe liver disease, complicated diabetes). Options include:

- Norethindrone acetate
  - 5 mg every 8 hours for 3–7 days →
  - 5 mg every 12 hours for 3–7 days →
  - 5 mg once daily until anemia improves
  - Withdrawal bleeding: 3–7 days after stopping.
- Medroxyprogesterone acetate
  - 10–20 mg every 8 hours (max 80 mg/day) →
  - Reduce to 10–20 mg once daily after 3–7 days.
- Micronized progesterone: 200 mg/day.
- Typical duration: 10–14 days.

If bleeding does not improve within 24 hours of high-dose progestin, evaluate for bleeding disorders, infection, or structural pathology.

D. Supportive Therapy- Iron supplementation for all patients with anemia or iron deficiency.

3. Long-Term Management

Stabilize the endometrium, control bleeding, and prevent anemia. Adolescents with ovulatory AUB often struggle to achieve short-term cycle regularity, and those with bleeding disorders have underlying coagulation dysfunction. After acute hemostasis, maintenance therapy is required to regulate menstruation and prevent recurrence. Continue treatment for at least 3–6 months.

Treatment Options:

A. **Progestogen-only therapy:** Preferred agents include natural progesterone or dydrogesterone.
- Second half-cycle regimen: Start day 15 for 10–14 days.
- Full-cycle regimen: From day 5 for 20–22 days if bleeding persists.
  Initial withdrawal bleeding may be heavy, especially after Hb normalization, but regular use improves HMB.

B. **COCs:** Low-dose (20–30 µg ethinyl estradiol) for those requiring contraception or with hyperandrogenism.

C. **Sequential estrogen–progestin therapy:** Indicated if no withdrawal bleeding occurs after progestin therapy (suggesting low endogenous estrogen).

D. **Agents to reduce menstrual volume:** COCs, progestogens, LNG-IUS, tranexamic acid, and NSAIDs.

E. **GnRH analogs:** Not recommended for routine HMB. Reserved for precocious puberty, refractory AUB, or severe anemia requiring short-term amenorrhea, especially with structural causes.

Follow-up

If amenorrhea persists >3 months after stopping therapy (exclude pregnancy), repeat endocrine evaluation and induce withdrawal bleeding with progesterone. Long-term follow-up and counselling help prevent complications such as chronic anemia, infertility, and endometrial cancer.

Conclusion

AUB in adolescents may reflect normal cycle immaturity early after menarche or signal an underlying bleeding disorder. Careful evaluation with a broad differential diagnosis is essential. Most adolescents respond well to medical therapy; however, hematology referral, imaging, or further intervention should be considered in those who fail to improve.

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DRUG CORNER

TREATING POLYCYSTIC OVARY SYNDROME


Archana Kumari, *Assistant Professor, Sanjay Gandhi Post Graduate Institute of Medical Sciences, Lucknow;* ***Aashima Dabas,*** *Professor, Maulana Azad Medical College, New Delhi*

Polycystic ovary syndrome (PCOS) is a common endocrinal disease, seen in about 8% of adolescents [1]. Recent recommendations on making the diagnosis are discussed above, as many features of PCOS are normal during adolescence. The cornerstone of management remains lifestyle management (LSM) - exercise and/or multicomponent healthy diet combined with exercise and behavioral strategies. The adolescence-specific pharmacological (hormonal and non-hormonal) therapy options mentioned in the Table below are based on recent Guidelines [2].

Management of adolescent PCOS [1,2]

Treatment options	Remarks
Lifestyle management	• LSM should be recommended for all • Healthy lifestyle and prevention of excess weight gain should be emphasized to all adolescents who are not overweight. • Adolescents should aim for at least 60 min daily of moderate to vigorous intensity physical activity, including muscle & bone strengthening activities at least three times a week. • There is no evidence to support any specific type or diet or exercise.
Pharmacological treatment [no specific therapy approved for use in PCOS- to discuss the need with patient and the family]	
Combined oral contraceptive pills (COCP)	• To be used in 'at-risk' or confirmed PCOS cases for management of hirsutism and/or irregular menstrual cycles. • Decision to be personalized and discussed with adolescent and family. • 35 µg ethinyl estradiol (EE) plus cyproterone acetate preparations to be considered as second-line therapy, versus other COCPs. • Natural estrogen preparations and the lowest effective estrogen doses (20–30 µg of EE or equivalent), to be considered after careful evaluation. • COCP is preferred over metformin for hirsutism/menstrual irregularities. • Progestin-only OCP may be considered but evidence is limited.
Metformin	• Could be used as monotherapy for cycle regulation (limited evidence). • Preferred over COCP for metabolic indications. • Starting dose is 500mg with 1-2 weekly increments. Maximum dose in adolescents is 2 g/ day.

Anti-androgens	• Useful to treat hirsutism in women with PCOS, if there is a suboptimal response after a minimum of 6 months of COCP and/or cosmetic therapy. • Effective contraception for women in reproductive age as it may lead to undervirilization of male fetuses. • Spironolactone in doses 25mg-100mg/day has lowest associated side effects. • Cyproterone acetate >10mg is not advised due to increased risk of meningioma. • There is limited evidence on other anti-androgens like Finasteride, Flutamide, Bicalutamide etc. and they have increased risk of associated adverse effects.
Anti-obesity medications	• To comply with general population guidelines for choice of anti-obesity medications like GLP-1 agonists (Liraglutide, semaglutide) and orlistat.
Inositol	• Inositol (in any form) could be considered in women with PCOS based on individual preferences and values, noting limited clinical benefits including in ovulation, hirsutism, or weight. • Metformin should be preferred over inositol for metabolic indications. • Specific types, doses, or combinations of inositol cannot currently be recommended, due to a lack of quality evidence.
Cosmetic therapy	• Mechanical laser or light therapies can be used. • Multiple sessions may be required to achieve hair reduction.
Psychological and psychiatric treatment	• Psychological therapy should be offered in appropriate cases. • Anti-depression and anxiolytic treatments to be offered in diagnosed cases. • Agents that may worsen PCOS symptoms including weight gain should be avoided.

Newer therapies in PCOS

Non-hormonal Therapies used in various studies	**Doses**	**Main outcomes**
Metformin monotherapy [3]	1500-2000 mg/day	Improves insulin resistance, lowers total testosterone, and restores regular menses.
SPIOMET [3]	Fixed-dose combination of spironolactone (50mg), pioglitazone (7.5mg) & metformin (850mg)	Regulates menstrual cycle, improves hirsutism scores, reduces visceral and hepatic fat, improves inflammatory markers
Flutamide + Metformin [3]	Flutamide 62.5mg/day + Metformin 850mg/day (single study)	Substantial anti-androgenic and metabolic effects.
Nutritional supplements [4]	Chromium, inositol & Omega-3, Carnitine, chromium & soy isoflavones	Found to be beneficial for improving lipid profile, inflammatory factors and oxidative stress indicators.
GLP1 receptor agonists [5]	Liraglutide and semaglutide in anti-obesity doses as for the general population.	Evidence for use in adolescents is lacking. May inhibit chronic inflammation and improve ovarian microenvironment. Have been seen to improve menstrual irregularities.

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BIOCHEMICAL ASSESSMENT OF OVARIAN RESERVE IN CHILDREN AND ADOLESCENTS

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Assessment of ovarian reserve is increasingly becoming relevant in pediatric practice, particularly in girls who may be at risk of impaired ovarian function later in life. This includes children with genetic conditions affecting the gonads, those receiving gonadotoxic therapies, and survivors of childhood malignancies. In such conditions, biochemical markers can provide useful information about ovarian function and help us with counselling regarding future fertility.

Ovarian reserve refers to the number of primordial follicles present within the ovary. Direct assessment of the primordial follicle pool is not feasible in routine clinical practice because it would require histological examination of ovarian tissue. Imaging techniques such as ultrasonography (US) can visualize only growing follicles, particularly antral follicles. Although antral follicle count (AFC) assessed by transvaginal US is widely used as a marker of ovarian reserve in adult reproductive medicine, this method has limited applicability in children and adolescents, because transvaginal US is generally not feasible in prepubertal girls, and transabdominal imaging has lower sensitivity for detecting small follicles (1).

Molecular Biochemistry of Anti-Müllerian Hormone

Anti-Müllerian hormone (AMH), also known as Müllerian inhibiting substance (MIS), is a dimeric glycoprotein hormone belonging to the transforming growth factor-β (TGF-β) (2). The AMH gene is located on chromosome 19p13.3 and encodes a precursor protein of approximately 140 kDa. This precursor undergoes proteolytic cleavage to generate biologically active C-terminal homodimers (~25 kDa) that are responsible for receptor binding and biological activity (2).

AMH exerts its action by binding to the AMH type II receptor (AMHR2), a transmembrane serine–threonine kinase receptor expressed in gonadal tissues. Ligand binding activates intracellular signaling through phosphorylation of SMAD transcription factors, which subsequently regulate gene transcription, which is involved in follicular growth and differentiation (2).

In females, AMH is synthesized by granulosa cells of secondary, pre-antral, and small antral follicles, typically measuring less than 6–8 mm in diameter. AMH expression declines as follicles enlarge and is absent in dominant pre-ovulatory follicles. This pattern of expression explains why circulating AMH reflects the number of small growing follicles rather than the total primordial follicle pool (2).

Transcriptional regulation of AMH in granulosa cells involves several nuclear transcription factors including steroidogenic factor-1 (SF-1), FOXL2, GATA-4, and FOG-2. Gonadotropins such as FSH and LH may influence AMH production through these transcriptional mechanisms, although AMH secretion remains relatively independent of short-term gonadotropin fluctuations (2).

Role of AMH in Folliculogenesis

AMH plays an important regulatory role in ovarian follicle dynamics. Experimental studies and human ovarian tissue data suggest that AMH may suppress the initial recruitment of primordial follicles and reduce the sensitivity of developing follicles to FSH, thereby regulating early follicular growth. Through these mechanisms, AMH is thought to help modulate follicular recruitment and maintain controlled folliculogenesis (2).

Age-Related Trends in AMH

Early studies measuring Müllerian inhibiting substance demonstrated detectable levels from infancy through adulthood, establishing the developmental pattern of AMH secretion (4). Subsequent longitudinal studies have shown that AMH levels remain relatively stable within individuals across childhood and adolescence (3). Levels are typically very low at birth, followed by a transient increase during infancy. Concentrations gradually increase throughout childhood, reflecting increasing follicular activity, and a mild decline may occur around puberty (1,5).

A systematic review, pooling data from multiple studies, reported median AMH levels of approximately 9.85 pmol/L in infancy, 24.49 pmol/L in childhood, and 26.32 pmol/L during adolescence (1).

Approximate AMH Levels Across Pediatric Age Groups

Age group	Median AMH	Mean AMH
Infancy (0–1 year)	9.85 pmol/L	10.55 pmol/L
Childhood (1–10 years)	24.49 pmol/L	22.32 pmol/L
Adolescence (10–19 years)	26.32 pmol/L	31.84 pmol/L

These values represent pooled estimates derived from observational studies in healthy children and should be interpreted as approximate clinical guides rather than strict reference intervals, because of assay variability and methodological differences across studies (1).

Other Biochemical Markers

Other biochemical markers have also been explored. Inhibin B, another hormone secreted by granulosa cells, reflects gonadotropin-dependent follicular activity and tends to increase from childhood into adolescence. However, its levels show considerable variability and therefore it is less reliable as a standalone marker of ovarian reserve (1). Hormones such as FSH and estradiol, commonly used in adult reproductive endocrinology, mainly reflect pituitary–ovarian feedback rather than the size of the follicular pool and are therefore less informative in prepubertal children (1).

Limitations

Current evidence on ovarian reserve markers in children remains limited. Most studies are relatively small and use different AMH assay platforms, making it difficult to establish uniform pediatric reference ranges (1). In addition, AMH reflects the pool of small growing follicles rather than the primordial follicle pool and therefore provides only an indirect estimate of true ovarian reserve (2).

Conclusion

Although AMH is not a direct measure of the primordial follicle pool, it remains the most practical biochemical marker currently available for assessing ovarian reserve in children and adolescents, provided its interpretation is made cautiously in the context of age, pubertal stage, and clinical setting.

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PEDSENDOSCAN

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Shim JY, Laufer MR, King CR, et al. Evaluation and Management of Endometriosis in the Adolescent. Obstetrics & Gynecology. 2024;143(1):44–51.

High-impact narrative review from major US tertiary centers, including Boston Children's Hospital/Harvard, Cleveland Clinic, University of Pittsburgh, and Stanford, summarizing contemporary evidence on diagnosis, evaluation, and management of adolescent endometriosis. The review emphasizes that symptoms often begin early: in one registry survey, two-thirds of adults with endometriosis reported first pelvic symptoms before age 20 years, and 21% before 15 years. Among adolescents undergoing evaluation, disease prevalence is substantial: a cited systematic review found

laparoscopically confirmed endometriosis in **62%** adolescents undergoing laparoscopy for any pain, **75%** in those with chronic pelvic pain resistant to treatment, and **70%** in those with dysmenorrhea. Another review reported prevalence ranging from **25-100%** (mean 64%). The review also highlights that adolescent presentation is frequently atypical: in one retrospective study, 62.5% had both cyclic and acyclic pain, 28.1% had acyclic pain alone, and only 9.4% had dysmenorrhea alone, i.e. 90.6% had some degree of acyclic pain. The paper is clinically valuable because it reminds us that **severe dysmenorrhea, chronic pelvic pain, heavy or irregular bleeding, school absenteeism, and pain refractory to NSAIDs or hormonal therapy should not be normalized in teenagers,** and that a low **threshold of suspicion is needed to reduce diagnostic delay.**

Ayonrinde OT, Mori TA, Adams LA, et al. MASLD coexisting with PCOS increases cardiometabolic risk. J Clin Endocr Metab. 2026. dgag008, https://doi.org/10.1210/clinem/dgag008
Community-based longitudinal cohort data from the Raine Study, Western Australia**,** evaluating whether coexistence of PCOS and MASLD in adolescence predicts worse cardiometabolic outcomes in adulthood than either condition alone. Of 199 female adolescents who underwent assessment including anthropometry, blood tests, pelvic ultrasound, and abdominal ultrasound; with PCOS defined at age 14y using updated criteria, and MASLD at age 17y, 148 had repeat cardiometabolic assessment at 27y. At age 17y, 37/199 (18.6%) had MASLD and 32 (16.1%) had PCOS; of those with PCOS, 12/32 (37.5%) also had MASLD. Thus in the entire cohort, PCOS + MASLD was present in 12 (6.1%)**,** PCOS alone in 20 (10.3%)**,** MASLD alone in 26 (13.2%)**,** and neither in 137 (70.3%). Adolescents with PCOS + MASLD had greater obesity, higher remnant lipoprotein cholesterol, higher free and total testosterone, and lower SHBG than those with PCOS alone, MASLD alone, or neither. By age 27y, those with adolescent PCOS + MASLD were more insulin resistant and had higher remnant lipoprotein cholesterol and TG/HDL ratio than all other groups, whereas PCOS without MASLD or obesity did not predict future insulin resistance. Though the numbers are small, this report **that coexistence of liver steatosis with PCOS, rather than PCOS alone, identifies a particularly high-risk phenotype, with likely adverse cardiometabolic outcomes later.**

Noon SL, Chun LF, Mackay G, Schwimmer JB. Menstrual Dysfunction Is Associated with Elevated Liver Enzymes in Adolescent Females: A United States Population-Based Study. J Adolescent Health. 2025.
Cross-sectional population-based study using NHANES 2011–2020 data from the United States, designed to examine whether menstrual dysfunction and biochemical hyperandrogenism are associated with hepatic risk in adolescence. The analytic sample included 1,651 females ages 12-19y and at least 2 years post-menarche. Amenorrhea was defined as self-reported absence of menses in the prior 12 months, and biochemical hyperandrogenism as free androgen index ≥5. Elevated ALT >22 U/L was the primary hepatic outcome, and suspected MASLD was defined as elevated ALT plus ≥1 cardiometabolic risk factor**.** Survey-weighted logistic regression models were adjusted for age, race/ethnicity, and BMI percentile**.** Amenorrhea was present in 2.8% participants, and was associated with higher odds of elevated ALT **(**adjusted OR 2.5, 95% CI 1.1–5.7). Biochemical hyperandrogenism was independently associated with elevated ALT **(**adjusted OR 2.6, 95% CI 1.4–4.8**).** The positive association between insulin resistance and ALT was stronger among adolescents with amenorrhea (β = 2.7 vs 1.1), and although ALT rose with increasing BMI, adolescents with amenorrhea had consistently higher ALT prevalence even at normal BMI. This links adolescent reproductive dysfunction to early hepatic-metabolic risk and **supports ALT screening even in non-obese girls with menstrual dysfunction or hyperandrogenism**.

Kim JJ, Hwang KR, Lee D, et al. Adolescents diagnosed with polycystic ovary syndrome under the Rotterdam criteria but not meeting the diagnosis under the updated guideline. Human Reproduction. 2024;39(5):1072–1077.
Retrospective hospital-based study from **Seoul National University–affiliated centers, South Korea,** including girls seen between **2004 and 2022**. The authors studied **315 adolescent girls diagnosed with PCOS by 2003 Rotterdam criteria**, all **2–8 years since menarche**, and reclassified them using the updated international adolescent guideline, which requires **both ovulatory dysfunction and hyperandrogenism** and does **not recommend ultrasound** for diagnosis in girls with gynecologic age **<8 years; 428 healthy controls** were used for comparison. Phenotype distribution in the Rotterdam-diagnosed cohort was **IM/HA/PCO 206 (65.4%), IM/HA 30 (9.5%), HA/PCO 12 (3.8%),** and **IM/PCO 67 (21.3%).** On applying the updated criteria, **79/315 (25.1%)** girls with **HA/PCO or IM/PCO** no longer met diagnostic criteria and were designated **"at risk."** Although those meeting adolescent criteria had the worst metabolic profile, the at-risk group was not benign: despite **~90% not being overweight or obese**, they still had **higher blood pressure, triglycerides, insulin-resistance parameters, LH, and LH/FSH ratio** than controls, with considerable overlap with the definite-PCOS group. The study supports **the newer adolescent criteria as a way to reduce overdiagnosis by about one-fourth**, while also showing that girls who lose the PCOS label still require **longitudinal metabolic and reproductive follow-up**.

Neven ACH, Forslund M, Ranashinha S, et al. Prevalence and accurate diagnosis of polycystic ovary syndrome in adolescents across world regions: a systematic review and meta-analysis. European Journal of Endocrinology. 2024;191:S15–S27.

Systematic review and meta-analysis, registered on **PROSPERO (CRD42022372029),** examining global adolescent PCOS prevalence across world regions and comparing estimates derived from **2003 Rotterdam criteria** versus **current International Evidence-based Guideline criteria.** The authors searched **OVID MEDLINE, All EBM, PsycInfo, EMBASE, and CINAHL** from **1990 to November 2023** for studies in **unselected adolescent populations.** Of **15,708 records** identified, **24 articles reporting 23 studies** were included, and pooled meta-analysis covered **20 studies with 14,010 adolescents**. **Global prevalence was 9.8% (95% CI 7.2–12.3) using Rotterdam criteria, but only 6.3% (95% CI 3.9–8.8) using guideline criteria that exclude polycystic ovarian morphology (PCOM)**; self-reported prevalence was also **9.8% (95% CI 5.5–14.1)**. By WHO region, prevalence using guideline criteria ranged from **2.9% (95% CI 2.0–3.9)** in the **Western Pacific** to **11.4% (95% CI 7.1–15.7)** in **South-East Asia**. This is one of the strongest recent evidence-synthesis papers in adolescent PCOS because it quantifies how inclusion of PCOM inflates prevalence and strongly supports current practice of excluding ovarian morphology from adolescent diagnosis while following those with isolated irregular cycles or hyperandrogenism as **"at risk."**

LISTENING TO THE STALWARTS

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Dr Vijayalakshmi Bhatia

CAPE News is back with a fresh episode of "Podcast with Stalwarts". It was gratifying to know about Dr Vijayalakshmi Bhatia ma'am and gain insights into her contributions to the field of Pediatric Endocrinology in India. We thank her for accepting the invitation and giving us time despite her hectic schedule and commitments. I learnt how she was destined to make such meaningful and monumental contributions, including starting the first formal fellowship program at SGPGI Lucknow, laying the foundation stone of registering ISPAE as a Society, and being active as a mentor to countless students. We hope that all viewers and listener will find the episode immensely useful. Link- https://youtu.be/b8HH7JZke2c

CASE REPORTS

CASE OF PERIPHERAL PRECOCIOUS PUBERTY DUE TO FUNCTIONAL OVARIAN CYST

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Case Presentation:

A 2y1m old girl presented with vaginal bleeding since the age of 4 months. She was the firstborn of non-consanguineous parentage, delivered at term by vaginal delivery with birth weight of 2.5 kg. Due to meconium aspiration, baby was in NICU for 3 days after birth. Milestones and vaccination were appropriate for age. From the age of 4 months, she was getting recurrent episodes of vaginal bleeding associated with white discharge for 4-5 days, every 3-4 months, needing 2-3 diaper changes daily. For the preceding 3 months, breast enlargement and development of coarse pubic hair was noted. There was no history of dry skin, unusual weight gain or constipation, of polyphagia or polydipsia, nothing suggestive of usage of oral/topical steroids, cosmetics, trauma or foreign body; no symptoms suggestive of hyperthyroidism, headaches, seizures, laughing spells, head trauma or radiation exposure. There were no complaints regarding her 2 month old younger sister. Her mother had attained menarche at the age of 13y. On examination, height was 86 cm (25-50th centile, Z score -0.49), weight 12 kg (10-25th centile, Z score -0.49), no bony deformities, no café-au-lait macules, normal abdominal examination with no organomegaly. Tanner staging was B3P2A0, with no clitoromegaly. The bone age was advanced at 3y. Thyroid profile was normal. GnRH stimulation test was suggestive of peripheral precocity with elevated estradiol level

(Table). On USG pelvis, uterine size was 36x16 mm with thin endometrium, ovaries were not clearly seen, but a cyst was reported in the left hemipelvis: 22x19 mm (Fig.), with no septations or solid areas, suggestive of a functional ovarian cyst. She was advised Letrozole 2.5 mg once daily, with periodic USG monitoring of the ovarian cyst to monitor its regression.

Table: Summary of investigations

	Range (units)	16/12/2025	23/02/2026	GnRH stimulation Test (Triptorelin) (27/02/2026)		
				0 hr	4 hr	8 hr
FSH (IU/L)	<4.0	0.16	<0.3	<0.3	1.47	1.12
LH (IU/L)	< 0.3	0.7	<0.1	<0.1	0.12	0.1
Estradiol (pg/mL)	<20	48.84	24.67			
TSH (IU/L)	0.6–5.0		1.32			
fT4 (ng/dL)	0.9–1.6		1.40			
PRL (ng/mL)	< 20.		23.80			
Calcium (mg/dl)	8.8-10.8	10.5	10.4			
Phosphorous (mg/dl)	4.3-5	5.4				

Fig. Ovarian cyst 22x19 mm in left hemipelvis

Discussion:

Precocious puberty (PP) in girls, defined by the development of sexual characteristics (development of breast, pubic or axillary hair and/or menstrual bleeding) before the age of 8y, with peripheral precocity being the cause in about 20% of all cases. The pooled prevalence of precocious puberty was 7.87% for girls and 3.98% for boys. (1) Children with peripheral PP often present with discordant features of sexual maturation, unlike the classic sequence of development of secondary sexual characteristics seen in central PP (CPP).

Functional follicular ovarian cysts, either isolated or as part of McCune Albright syndrome (MAS), most commonly present with vaginal bleeding at a very young age in girls, with conspicuously absent pubic hair, variable or absent development of breast tissue, and variable enhancement of growth velocity. Features of MAS apart from PP, include fibrous dysplasia of bone, café-au-lait skin pigmentation and hyperthyroidism. (2) Functional ovarian cysts are self-limited, but recur frequently. Van Wyk-Grumbach syndrome, with longstanding, uncontrolled hypothyroidism, can also result in ovarian cysts and vaginal bleeding due to the spillover effect of TSH on FSH receptors. However, this situation is characterized by short stature and delayed bone age. Granulosa cell tumors of the ovary are rare causes of Peripheral PP. (2)

Ultrasonography (USG) detects ovarian cysts: larger cysts (size > 2 cm diameter) are associated with Peripheral PP. (3) USG also helps in differentiating benign from malignant lesions: cysts with few internal echoes suggestive of hemorrhage, without septation or calcification are usually benign, requiring observation with follow-up ultrasound in 4-8 weeks.

Letrozole (aromatase inhibitor) in a dose of 2.5 mg/day is the primary drug of choice for treating peripheral PP, due to its proven role not only in cessation of vaginal bleeding, but also in improving final height outcomes. Surgery may be required for very large ovarian cysts (> 20 mL) because of the risk of adnexal torsion, as the risk of recurrence is more with even after surgical removal in smaller cysts. (3) Longstanding delays in management lead to recurrent bleeds, rapid advance in bone age, leading to central PP and final short stature.

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GALACTORRHEA IN ADOLESCENCE: LOOKING BEYOND PROLACTINOMA


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A 13-year-old girl presented with a three-month history of bilateral galactorrhea and irregular, heavy menstrual cycles, following menarche at the age of 10 years. On examination, her height was 131 cm, and bone age assessment revealed a significant delay (11.4 years). Given the presence of galactorrhea and menstrual irregularities, hyperprolactinemia was suspected. Laboratory evaluation revealed markedly elevated thyroid-stimulating hormone (TSH) of 908 µIU/mL, along with elevated serum prolactin of 63.7 ng/mL. Magnetic resonance imaging of the brain demonstrated pituitary hyperplasia with a 5.8 mm focal lesion, initially raising concern for a pituitary adenoma. However, the markedly elevated TSH suggested severe primary hypothyroidism as the underlying etiology. Following initiation of levothyroxine therapy, a dramatic biochemical response was observed, with TSH decreasing to 11.73 µIU/mL and prolactin normalizing to 2.62 ng/mL, confirming the diagnosis of secondary hyperprolactinemia due to hypothyroidism and highlighting the reversible nature of the pituitary changes.

DISCUSSION

Hyperprolactinemia is defined as a persistent elevation in circulating prolactin levels beyond the normal physiological range. Prolactin is a polypeptide hormone secreted by lactotroph cells of the anterior pituitary gland and plays a central role in lactation and reproductive physiology. Unlike most pituitary hormones, prolactin secretion is primarily under tonic inhibitory control by the hypothalamus. Dopamine released from tuberoinfundibular neurons acts on dopamine D2 receptors on pituitary lactotroph cells to suppress prolactin synthesis and secretion. Disruption of this dopaminergic inhibition, either through hypothalamic–pituitary disease or pharmacologic agents, results in increased prolactin release. In addition to dopamine, several factors stimulate prolactin secretion, including thyrotropin-releasing hormone (TRH), vasoactive intestinal peptide, estrogen, and neuroendocrine reflexes associated with suckling.

Dysregulation of prolactin secretion disrupts the hypothalamic–pituitary–gonadal axis and may lead to menstrual irregularities, infertility, galactorrhea, and hypogonadism. In adolescents, hyperprolactinemia may manifest with pubertal disturbances, primary amenorrhea, galactorrhea, or growth disturbances. The elevated prolactin levels suppress hypothalamic gonadotropin-releasing hormone (GnRH) secretion, which subsequently reduces luteinizing hormone (LH) and follicle-stimulating hormone (FSH) secretion. This suppression leads to hypogonadotropic hypogonadism and explains many of the reproductive manifestations associated with hyperprolactinemia.

The causes of hyperprolactinemia can broadly be classified as physiological, pharmacological, and pathological. Physiological elevations in prolactin occur during stress, sleep, pregnancy, and lactation and are typically transient. Pharmacological causes are common in clinical practice and result from medications that interfere with dopaminergic inhibition of prolactin secretion. Drugs such as antipsychotics, antidepressants, gastrointestinal prokinetic agents, and certain antihypertensive medications may elevate prolactin levels by blocking dopamine receptors or altering dopaminergic signaling. Pathological causes include prolactin-secreting pituitary adenomas, or prolactinomas, which represent the most common hormone-secreting pituitary tumors. These tumors are classified according to size as microprolactinomas (<10 mm) or macroprolactinomas (≥10 mm). Microadenomas are more frequently diagnosed in women, whereas macroadenomas are more commonly identified in men and in pediatric populations at presentation. In children and adolescents, prolactinomas may present with pubertal disturbances, delayed sexual maturation, primary amenorrhea, or galactorrhea.

Secondary hyperprolactinemia may also occur in systemic conditions such as primary hypothyroidism, chronic renal insufficiency, liver disease, or pituitary stalk compression caused by nonfunctioning tumors. Rarely, ectopic prolactin secretion from extra-pituitary tissues has been reported, although such cases remain uncommon.

Evaluation of suspected hyperprolactinemia begins with measurement of serum prolactin: normal levels typically range between 2 and 23 ng/mL. Levels between 50 and 300 ng/mL are commonly observed in microprolactinomas, whereas macroprolactinomas may produce prolactin concentrations ranging from 200 to

several thousand ng/mL. However, interpretation of prolactin levels requires awareness of potential laboratory artifacts and variants. An important diagnostic pitfall is the "*hook effect*", which occurs when extremely high prolactin concentrations saturate both capture and detection antibodies in immunometric assays, producing falsely low measured prolactin values. This phenomenon may lead to underestimation of prolactin levels in patients with large macroprolactinomas. Dilution of the serum sample can help identify and correct this artifact.

Another important consideration is macroprolactinemia. Macroprolactin consists of prolactin bound to immunoglobulin G, forming a large molecular complex with reduced biological activity. Although macroprolactin can be detected by standard immunoassays, it often produces minimal clinical symptoms despite elevated measured prolactin levels. Screening for macroprolactin using polyethylene glycol precipitation may therefore be helpful when there is discordance between prolactin levels and clinical findings. If secondary causes are excluded and hyperprolactinemia persists, imaging of the hypothalamic–pituitary region is recommended. Magnetic resonance imaging of the pituitary gland is the preferred modality for identifying prolactinomas or other sellar lesions. Additional evaluations may include evaluation of other pituitary hormones, visual field testing when macroadenomas are suspected, and assessment of bone density.

Management of hyperprolactinemia depends on the underlying etiology and clinical presentation. Dopamine agonists represent the first-line therapy for most patients with prolactinomas. These agents stimulate dopamine D2 receptors on lactotroph cells, restoring inhibitory control of prolactin secretion. Treatment results in normalization of prolactin levels, restoration of gonadal function, and often significant tumor shrinkage. Cabergoline and bromocriptine are the most commonly used dopamine agonists. Cabergoline is generally preferred due to its greater efficacy, longer duration of action, and improved tolerability. Bromocriptine remains an effective alternative and has extensive safety data, particularly in women seeking pregnancy. Surgical intervention is reserved for patients who are resistant or intolerant to medical therapy or in cases where tumors cause significant neurological complications.

Importantly, when hyperprolactinemia is secondary to systemic disease, management should focus on treating the underlying condition. In the present case, correction of severe primary hypothyroidism with levothyroxine therapy resulted in normalization of prolactin levels and resolution of pituitary enlargement. This emphasizes the importance of evaluating thyroid function in patients presenting with hyperprolactinemia before attributing the condition to a primary pituitary disorder.

Hyperprolactinemia remains a multifactorial endocrine disorder. Although prolactinomas are the most frequently recognized cause, clinicians must maintain a broad differential diagnosis when evaluating elevated prolactin levels. A systematic diagnostic approach that considers physiological, pharmacological, and secondary endocrine causes can prevent misdiagnosis and unnecessary interventions. In pediatric and adolescent populations, where presentation may be with pubertal or menstrual abnormalities, awareness of conditions such as hypothyroidism-associated hyperprolactinemia is particularly important. Early recognition and appropriate treatment can lead to rapid clinical improvement and prevent long-term reproductive and metabolic complications.

Clinical takeaway: In adolescents presenting with galactorrhea or menstrual disturbances, thyroid dysfunction should always be excluded before attributing hyperprolactinemia to a prolactinoma.

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PEPP (JANUARY 2026)- XY DSD

Chetan Dave, *Consultant Pediatric Endocrinologist, Rajkot, Gujarat*

A few learning points:

1. Discrepancy between chromosomal sex, non-adult sex, and phenotypic sex is called disorder of sexual differentiation, or differences of sexual differentiation (DSD).
2. Presence of palpable gonads mostly signifies presence of testis and possibility of XY DSD.
3. Presence of Mullerian structures on ultrasound with palpable gonads is suggestive of possible AMH defect.
4. Though genetic evaluation is available, many XY DSD come up with the normal genetics.

5. Gender of rearing is a collective decision by the patient, family, pediatric-endocrinologist, geneticist, psychologist, and urosurgical team.
6. Most XY DSD should be reared as males, except complete androgen insensitivity syndrome and a few mixed gonadal dysgenesis.
7. Early gonadectomy in case of intra-abdominal dysgenetic gonads is advisable to prevent the occurrence of gonadoblastoma.
8. Regular endocrinological, urosurgical and psychological evaluation is must for the physical well-being of a patient and the mental well-being of the family.

PEP (FEBRUARY 2026)- NUTRITIONAL & NON-NUTRITIONAL RICKETS

Vijay Jaiswal, *Professor GMC, Saharanpur.*

The program began with a brief welcome by Dr Anurag Bajapai (President ISPAE) and Prof P Raghupathy (Patron of the series). A case of nutritional rickets was presented by Dr Pavitra Shah (3rd year PG, SGRR Institute of Medical and Health Sciences, Dehradun), under the guidance of Dr Aashish Sethi (Assoc Prof, SGRR Institute), with Prof Mahesh Maheshwari (AIIMS Bhopal) as examiner. The second case, of non-nutritional rickets, was presented by Dr Sonal (3rd year PG, AIIMS Bhopal) under the guidance of Dr Md Saleeque (DM resident, AIIMS Bhopal), with Dr Dhivya Lakshmi (Assoc Prof, Sri Ramchandra Medical College, Chennai) as examiner. OSCE was conducted by Dr Medha Mittal (Assoc Prof, CNBC, Delhi). Theory questions asked in DNB/PG exams were discussed by Dr Jaivinder Yadav (Assoc Prof, PGI Chandigarh). The vote of thanks was given by Prof Vijay Jaiswal (program coordinator).

A few learning points:

1. Rickets is a disorder of growing children that arises from defective mineralization of the growth plate.
2. Nutritional rickets can be prevented by maintaining adequate intake of vitamin D, both dietary and through sunlight exposure.
3. Vitamin D supplementation is effective in treating nutritional rickets (secondary to vitamin D deficiency) but not in most non-nutritional causes.
4. Knowledge of these conditions is essential for prompt diagnosis and proper management.

ISPAE 2025: ADVANCING ADOLESCENT ENDOCRINOLOGY THROUGH SCIENCE, INNOVATION, AND COLLABORATION

ISPAE 2025: the 9th Biennial Meeting of the Indian Society for Pediatric and Adolescent Endocrinology, held from 14-16 November 2025 at the Hotel Radisson Blu, Nagpur, brought together leading clinicians, researchers, and trainees from across India and abroad. The Organizing Chairperson Dr Ahila Ayyavoo, Organizing Secretary Dr Hari Mangtani, and Scientific Committee Chairperson Dr Vaman Khadilkar, did a magnificent job in putting together a meeting which reaffirmed ISPAE's commitment to advancing evidence-based care, fostering young investigators, and strengthening global collaborations in pediatric and adolescent endocrinology.

The vibrant inauguration function was graced by Chief Guest **Dr Vasant Khalatkar**, President, Indian Academy of Pediatrics 2025, and distinguished guests **Dr Uday Bodhankar** and **Dr Vinky Rughwani**.

A major highlight was the Lifetime Achievement Award conferred upon **Prof PSN Menon** and **Prof Palany Raghupathy**, honoring their extraordinary contributions to pediatric endocrinology, academic leadership, and medical publishing in India and internationally.

The scientific program, curated by an eminent Scientific Committee, showcased cutting-edge research across diabetes, growth disorders, bone health, genetics, and adolescent nutrition. The Young Investigator Award was presented to **Dr M Mohnish Darshan** for his interventional study on carbohydrate-counting–based insulin titration in children and adolescents with type 1 diabetes, highlighting the growing emphasis on individualized diabetes care.

The Oral Presentation Awards were won by **Dr Merin Abraham** (first prize) for her long-term experience in pediatric osteogenesis imperfecta, and **Dr Lekshmi G** (second prize) for her work on growth hormone therapy in Prader-Willi syndrome. **E-poster awards** recognized impactful quality-improvement initiatives and long-term outcome studies. Oral and poster sessions reflected the breadth and depth of contemporary pediatric endocrinology in India. Notable themes included the use of digital health tools such as the Diabuddy™ mobile application, deep-learning–based bone age assessment, early detection of diabetes-related complications, and genotype–phenotype correlations in rare endocrine disorders. Studies addressing public health concerns — such as adolescent malnutrition, growth assessment standards, and cystic fibrosis-related diabetes — underscored the relevance of endocrinology beyond tertiary care settings.

ISPAE PET Fellows School 2025 was conducted under the leadership of Dr Shaila Bhattacharya (Convener) and Dr Anurag Bajpai (Co-Convener). It reaffirmed the society's commitment to advancing excellence in pediatric and adolescent endocrinology through the integration of high-quality scientific discourse, structured mentorship, and collaborative engagement. The program provided a robust academic platform for trainees, facilitating meaningful interactions with both national and international faculty, thereby promoting knowledge exchange and professional networking. In addition to its academic rigor, the program incorporated opportunities for informal engagement, including a curated visit to the Pench National Tiger Reserve, fostering collegiality and peer bonding.

Overall, **ISPAE 2025** successfully blended academic rigor, mentorship, and innovation, serving as a dynamic platform for sharing knowledge and shaping the future of pediatric and adolescent endocrinology in India. The meeting reinforced ISPAE's pivotal role in nurturing young talent while addressing emerging challenges in endocrine health across the lifespan.

REPORT: IDEAL & BEST PROGRAMS

IDEAL PROGRAM ACTIVITY REPORT (JANUARY–MARCH 2026)

Strengthening IDEAL… The Family Grows

***Preeti Singh**, Professor, Lady Hardinge Medical College & Kalawati Saran Children's Hospital, New Delhi*

The ISPAE Diabetes Education And Learning (IDEAL) program continues to strengthen its academic and outreach activities, reflecting sustained growth in participation, engagement, and educational impact. **IDEAL Batch 11** is ongoing, with 10 batches completed following the format of two batches for Pediatric Diabetes Educators (PDEs) and every third batch for physicians. The strength of certified PDE IDEALites now stands at 148, along with 82 certified physician IDEALites, and over 70 faculty members, from across the country. Our vibrant WhatsApp group, **IDEALites** (304 members) is active in learning, motivation, sharing experience and information (of products, meetings, activities, warnings) and networking. The year commenced with the successful

orientation of IDEAL Batch 11 on 16th January 2026, held during the festive occasion of Pongal and Makar Sankranti, onboarding a new cohort of healthcare professionals (HCPs) and volunteers committed to structured learning in pediatric diabetes care.

The **Ongoing Pediatric Diabetes Education (OPDE)** initiative continued to serve as an important platform for knowledge sharing and patient-centered discussions. An insightful OPDE session on **11th January** on "Very *Low-Carb Diets – do they make sense in managing Type 1 diabetes?*", was delivered by Ms Sheryl Salis, Director, Nurture Health Solutions, Senior Registered Clinical & Sports Nutritionist, and Certified Diabetes Educator. The session highlighted the dangers of fad diets such as the low carb diet, especially for growing children and adolescents. The health and psychological burdens were discussed. The subsequent OPDE session held on **8th February** on "*Type 1 Diabetes and Marriage – My Journey in Helping Happy Unions*," had Ms Beemajan Yussouf, Certified Diabetes Educator, diabetes advocate, Vice Chairperson of T1DF India, and living with T1D since 1989, share her experiences. The well attended session was highly engaging, offering valuable insights into psychosocial aspects, lived experiences, and practical challenges related to relationships and marriage for individuals with T1D. Continuing this momentum, the upcoming OPDE session scheduled for **12th April** will focus on Basic Life Support (BLS), to be delivered by Dr Pallavi Yadav, will strengthen emergency preparedness among HCPs involved in diabetes care.

The **Monthly Myth-Busting Message (MMM)** initiative remains a cornerstone of IDEAL's educational outreach, delivering concise, evidence-based messages addressing common misconceptions in T1D. The **January** MMM highlighted what does *not* cause T1D: whether mother's diet during pregnancy, excessive sweet intake by the child, or contact with a person with T1D, emphasizing its autoimmune causation, with no clearly established trigger. The **February** MMM addressed concerns regarding the use of diabetes devices during examinations and highlighted the 2024 directive from the National Commission for Protection of Child Rights (NCPCR) permitting use of insulin pumps, continuous glucose monitoring devices, glucometers, and necessary snacks during examinations, along with practical guidance for implementation. The **March** MMM busted the common misconception that hypoglycemia makes exercise risky for individuals with T1D, emphasizing that physical activity is as essential for those with T1D as for those without diabetes, while underscoring the importance of blood glucose monitoring, insulin adjustment, and preparedness with snacks. IDEALite Savita Agarwal is translating them to Hindi, thus increasing their reach and relevance. Whether in English, or Hindi, the MMMs are being widely disseminated, and appreciated for their clarity, relevance, and patient-friendly format.

In addition, IDEAL has further strengthened its digital outreach through its social media platforms, including **Instagram** *(@ideal_diabeteseducation)*, **Facebook** & *X IDEAL (@ideal_diabetese) / X*, which serve as effective channels for sharing educational content, increasing visibility, and engaging with HCPs, persons with diabetes, caregivers and other family members, across diverse settings. The program continues to evolve as a robust and impactful platform for capacity building and improving the quality of care in pediatric diabetes.

BEST (Basic Education Series on Type 1 Diabetes) Program Report: Education to Empowerment

The BEST program has successfully completed 11 batches, training over 350 participants in the fundamentals of pediatric diabetes care. The program has played a significant role in strengthening the knowledge and skills of parents, people with diabetes (PwD), and HCPs. By focusing on practical aspects of diabetes management, BEST is empowering participants to adopt effective self-care practices, improve treatment adherence, and enhance day-to-day decision-making. Importantly, the program has also nurtured a strong sense of advocacy, enabling PwD and caregivers to actively engage in care, support peers, and contribute to spreading awareness within the community. Building on this momentum, the next batch of BEST is scheduled for April–May 2026, with continued efforts towards expanding its reach and impact.

ACTIVITIES BY ISPAE MEMBERS

GUWAHATI CONCLAVE ON T1D IN CHILDREN - DIABETES LOOKS EAST: FEBRUARY 2026

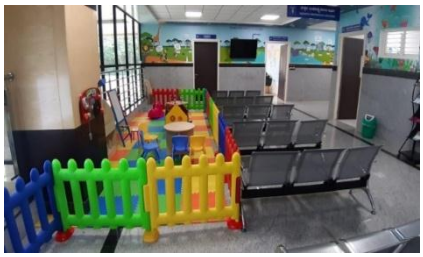
Anju Virmani, *Director, Pediatric Endocrinology, Max Smart Super Specialty Hospital & Rainbow Children's Hospital, New Delhi*

The Dept of Pediatrics, AIIMS Guwahati, its dynamic Head, **Prof Jaya Shankar Kaushik**, and Patron **Prof Ashok Puranik** (Executive Director, AIIMS Guwahati) took an important step towards improving care of children with T1D in the Northeast by organizing a special Conclave on 7th Feb, with the able help of Dr Bipul Das. The driving spirit was **Dr Smita Joshi**, whose advocacy work we are all familiar with. The eminent faculty was drawn from across the country: speakers Drs Vandana Jain (Delhi), Jaivinder Yadav (Chandigarh), Lokesh Sharma (Lucknow), Bhanu K Bhakhri (Noida), Anju Virmani (Delhi), Taher Hossain (Bengal), Abhishek Raha (Lumding, Assam), Uma Saikia and Abhamoni Baro (Guwahati), were joined by Mr Nandish Pethani (Health Policy Research), Ms Mehak Dhingra (Unstoppable), Mr Rinku Mittal (IIT Guwahati), and Ms Anupama Pathak Kalita (Sudhanya), with Chairpersons from all over the Seven Sisters and Sikkim - Prof Ashok Bhuyan, Dr Sanjeev Chakravarty, Prof Bhupen Barman, Prof Gayatri Bezboruah, Prof Himesh Barman, Dr Sudip Dutta, Dr Nibedita Goswami, Mr Subramani Kanagaraj, Prof Indira Das and Prof Salam Ranabir. The delegates included doctors taking care of children with T1D – pediatricians, pediatric endocrinologists, endocrinologists, general physicians; Diabetes Educators, especially those running NGOs; children and their caregivers. Set in the beautiful campus of AIIMS Guwahati, it was an exciting opportunity for all to learn, share and network. We hope to carry forward future activities to increase awareness and facilities, and thus improve T1D care in this beautiful part of India.

NEWS FROM KARNATAKA INSTITUTE OF ENDOCRINOLOGY & RESEARCH, BENGALURU

PLAY AREA AND PEDIATRIC PHLEBOTOMY AREA: SPACE THEMED CHILD-CENTERED CLINICAL ENVIRONMENT AT KIER

Deepthi S, *Sharanya S Shetty, Shruthi R, Karnataka Institute of Endocrinology & Research, Bengaluru*



Children with type 1 diabetes mellitus (T1D) and other endocrine disorders visiting a hospital for medical treatment can experience significant amount of stress and anxiety, due to the unfamiliar and intimidating environment, and the repeated blood sampling required for diagnosis, monitoring, and long-term management. The child's anxiety, needle fear, procedural distress and poor cooperation add to caregivers' stress. To address these challenges, KIER, with the collaboration of the Novo Nordisk Education Foundation (NNEF), has incorporated a **play area** in the pediatric OPD and established a dedicated **pediatric phlebotomy area**, to reduce anxiety, provide distraction, thus creating a more comfortable, reassuring, and positive healthcare experience for children and their caregivers.

The play area in the OPD helps to distract the children and reduce their anxiety. Their being engaged in playful and enjoyable activities in turn reduces caregivers' stress and anxiety. Interaction with other children and caregivers helps to normalize their experience and increase a sense of community and support among children and families. To maximize the effectiveness of the play area, a variety of activities suitable for different age

groups, from toddlers to school age children, are available: a wall-mounted wooden dashboard, an activity cube including maze beads, a shape sorter, an animal shaped-rocker, and various tracking and rotating activities - for toddlers; a library with books on yoga, animal species, short stories, cartoons; table and chairs for reading and activities; a blackboard for drawing and a foosball table - for older children. Use of bright colors and a child-friendly decor with wallpapers of ocean, farm and world map make the space feel more inviting and less intimidating. Safety being paramount, the area has a soft, non-toxic mat; none of the items have sharp edges.

Non-pharmacological, child-centered distraction methods such as cartoon viewing, video games, and audiovisual engagement, significantly reduce pain, anxiety, and fear during pediatric phlebotomy, and improve procedural cooperation. The pediatric phlebotomy area has been designed as a safe, welcoming, and child-friendly space, incorporating a space-themed design, with wall decals and visual elements that create an engaging, diverting, positive, feel-good atmosphere. An inspirational poem on the wall reinforces positive thoughts, courage, and resilience. A specially designed, cushioned pediatric phlebotomy chair with space and aircraft-themed upholstery and well-designed hand rests, provides stability, comfort, and proper positioning. For infants, a supportive positioning infant comfort bed ensures safe and secure posture and minimizes distress during blood collection.

The play area and pediatric phlebotomy area in our outpatient department reflects our commitment to holistic, patient-centered care by providing safe, engaging environment through thoughtful design features and appropriate distraction techniques, thereby promoting emotional well-being. The resultant reduced anxiety and stress in the children and their caregivers, and opportunity for interaction and play, is fostering a positive association with the healthcare setting, thus building long-term trust and engagement.

PROJECT LIFELINE: DIABETES CARE AND SUPPORT

Shilpa C Parihar, *Cynthiyal T, Santhosh Olety*

Rotary Bangalore Palmville's flagship project has been providing life-saving insulin support to 30 children living with Type 1 diabetes (T1D) for the past 4y, with nearly 50,000 vials of insulin sponsored annually. During the program on XXX, deeply emotional parents shared their journeys, with moments of tears, gratitude, and hope as they thanked Rotary Bangalore Palmville and KIER for standing by their children. The program was attended by District Governor Rtn. Sridhar BR, District Secretary Rtn. Balaji TR, Assistant Governor Rtn. Abhik Biswas, District Community Service Director Rtn. Ravichandran, and Rotary members PP Soumitro Ghosh, PP Minal Goyal, President Pallavi Agrawal, Arun Agrawal, Dr. Aanchal M Dua, Lina Bollapragada, Kuheli Ghosh, Pavan Goyal, and Asha Jain, whose support added immense value to the program. The dedicated efforts and the generous support of CSR partner Inflow Technologies, for making this life-saving service possible, was gratefully acknowledged.

The event also marked the inauguration of a Wound Autofluorescence Imaging Device, donated to the Podiatry Department at KIER, enabling early detection of diabetic foot complications and helping prevent infections, amputations, and long-term suffering.

NEWS FROM YOG DHYAN FOUNDATION (YDF): JANUARY – MARCH 2026

Anil Vedwal, *Chief Functionary, YDF*

YDF has initiated dedicated **holistic health sessions** from **January 2026**, for children and adolescents with Type 1 Diabetes (T1D), focusing on emotional well-being, stress management, and confidence building, helping children and families cope better with the daily challenges of managing diabetes. Each month, about 30 children are being supported in this way.

Our ongoing regular activities continue. We ended 2025 and began 2026 impactfully with two Sunday Camps for Annual Health Check-Ups on **28th Dec** and **4th Jan** at the YDF Center, aiming at early detection of complications and timely intervention. More than 450 children with T1D received complete physical examinations, injection site and lipohypertrophy assessment, foot and neuropathy screening, blood tests including HbA1c, and detailed eye check-ups. An eye care awareness session was also kindly conducted by Dr Govind Prakash from Shroff Eye Center. The event was graced by Ms Bindiya Chhabra and Mr Rummy Chhabra, and concluded with joyful birthday celebrations for January-born children, reflecting YDF's commitment to holistic care and community bonding.

The online monthly program **Look! One Virtual Event** on **18th Jan**, with the theme "*Sports & T1D – Breaking Barriers, Building Champions*", emphasized the importance of physical activity and self-confidence among children with T1D, with expert insights from pediatric endocrinologist Dr V Shobi Anandi (Coimbatore) and an inspiring journey shared by Hero of the Month Mr Ayush Sharma (table tennis champion). Panelists Mr Amandeep Singh (online fitness coach), Mr Naman Sharma (skipping champion), and Mr Yaksh Tomar (swimming champion) encouraged active participation in sports along with effective management of diabetes, motivating them to overcome limitations with confidence.

In **February** and **March**, YDF focused on supporting children to manage diabetes confidently during CBSE and school examinations: Sunday camps on **1st Feb** and **1st March** had sessions on emergency preparedness, sick day management, ketone monitoring, and lipohypertrophy awareness (along with distribution of essential diabetes supplies). In addition, YDF launched a four-part **social media awareness campaign** on the rights of children with T1D during exams, to ensure they can manage without fear or difficulty. **Look! One Virtual Event** on **8th Feb**, themed on "*Healing Beats: Music, Mind & Type 1 Diabetes*", highlighted the role of music and enjoyable activities in reducing stress and promoting emotional well-being, which is so important for persons with T1D. Pediatric endocrinologist Dr Ganesh Jevalikar (Delhi/Gurgaon) provided valuable insights, and Hero of the Month Mr Kunal Malhotra recounted an inspiring story. Panelists Dr Hitesh Saraogi (Ghaziabad), Ms Riddhi Modi (Mumbai), and Ms Akshita (Karnal) shared practical insights, real-life experiences, and their favorite songs!

International Women's Day was celebrated on **8th Mar** with a special **Look! One Virtual Event** session on "*Holistic Health & Life Journey of Women Living with T1D*." Expert guidance from Dr Beena Bansal (Gurgaon), Dr Bhanu K Bhakri (NOIDA), Dr Deepa Maheshwari (Gurgaon), Dr Srishti Puri and Ms Mehak Dhingra (Delhi) emphasized the importance of holistic care and awareness for women living with T1D. The inspiring journey of Hero of the Month Ms Apoorva Sharma highlighted resilience, strength, and empowerment. On **20th Mar**, a special initiative undertaken by Rotary Club of Delhi Southend, saw the **distribution of AI Smart Glasses** (AI Spex) to more than 30 visually impaired children from blind schools and NGOs, including three children with T1D from YDF. This exciting initiative enables children to navigate their surroundings, read text, and connect better with the world through technology, enhancing independence, confidence, and accessibility. YDF expresses its sincere gratitude to Ms Madhurima Jain and all esteemed members of the Rotary Club of Delhi Southend for their generous support and meaningful contribution. On **22nd Mar**, YDF conducted its regular T1D camp at the YDF Center, with distribution of free diabetes care supplies, focusing on day-to-day diabetes education and problem-solving. Children's updated medical records were reviewed to analyse progress and ensure that all interventions were on the right track.

YDF extends its heartfelt gratitude to all doctors, volunteers, parents, and supporters for their continued dedication and contribution. These continuous efforts ensure YDF can help empower children living with T1D with knowledge, confidence, and comprehensive care, helping them lead healthier and happier lives.

INSPIRE 2026 - INSIGHTS INTO PEDIATRIC DIABETES RECOGNITION AND EDUCATION

Soundaram V, *Consultant Pediatric Endocrinologist, Apollo Children's Hospital, Chennai*

INSPIRE 2026, held on 4th January 2026 at Apollo Children's Hospital, was organized by Apollo Children's Hospital and the Chennai Pediatric Endocrinology and Diabetes Foundation, under the aegis of the Indian Academy of Pediatrics – Chennai City Branch. The wholesome and impactful Continuing Medical Education (CME) program had a fully packed auditorium, with active participation from pediatricians and postgraduate trainees. Practical, day-to-day management of pediatric diabetes was addressed, covering recent research updates, government facilities, NGO support, nutrition, physical activity, rapidly evolving diabetes technologies, and the importance of peer support groups. Delivered by an eminent faculty, the sessions were tailored to meet the clinical needs of practicing pediatricians and postgraduates. Overall, INSPIRE 2026 served as an enriching academic platform aimed at strengthening diabetes care at the primary and secondary levels.

PRECOCIOUS PUBERTY - CLINICAL CONVERSATIONS

Navya George, *Shaila Bhattacharyya, Dept of Pediatric Endocrinology, Manipal Hospital, Bangalore*

A CME program on Precocious Puberty was conducted by the Dept of Pediatric Endocrinology, Manipal Hospital, Bangalore, under the guidance of Dr Shaila Bhattacharyya, Consultant Pediatric Endocrinologist, with the objective of creating awareness among pediatricians on the early identification of precocious puberty in children. The program emphasized differentiation between central and peripheral precocious puberty, diagnostic and treatment protocols, and psychosocial considerations. Interactive case-based discussions on central and peripheral precocious puberty in boys and girls, presented by Residents and Endocrine Fellows, enhanced practical understanding and highlighted the importance of early recognition and timely referral. It was well appreciated by the audience of about 50 delegates - postgraduate trainees, practicing pediatricians, gynecologists, and general practitioners; successfully strengthening awareness regarding the early identification of precocious puberty.

EDUCATIONAL PROGRAM FOR CHILDREN WITH TYPE 1 DIABETES AND THEIR FAMILIES

Koushik Urala, *Kasturba Medical College, Manipal Academy of Higher Education, Manipal, Karnataka*

On 31st January 2026, a meeting for children with type 1 diabetes (T1D) and their families organized by the Pediatric Endocrinology Clinic, Kasturba Medical College, Manipal and Kasturba Hospital, Manipal, was attended by over 50 families from Udupi and neighboring districts. The day-long program had health education-awareness sessions, screening for complications, and cultural programs by participants as well as treating doctors. Dr Ramesh Bhat Y (Head, Dept of Pediatrics, KMC Manipal) flagged off the program, then an overview was given by Assoc. Prof. Koushik Urala H (Pediatric Endocrinologist, KMC), who had conceptualized and coordinated it. The invited speaker, Dr Diksha Shirodkar (Pediatric Endocrinologist, Yenapoya Medical College, Mangalore)

discussed management of diabetes in school. Ms Suvarna Hebbar (Head, Dept of Clinical Nutrition and Dietetics), led a team of dietitians in conducting an interactive session on modifying routine home diet to suit the need of children with diabetes. The Dept of Ophthalmology conducted screening for diabetic retinopathy, Dept of Physiotherapy imparted awareness on foot care, while Dept of Yoga highlighted the importance and utility of yoga for better glucose control. Children performed various cultural programs and showcased their talents. The Valedictory and Prize Distribution Ceremony was attended by Dr Vinod C Naik (Associate Dean, KMC), and Dr Avinash Shetty (Medical Superintendent, Kasturba Hospital). It was a fun day.

PEDIATRIC ENDOCRINOLOGY CME: A DAY WITH PROF PSN MENON

Dhanya SM, *Aster MIMS, Kozhikode*

A Pediatric Endocrinology CME — "A Day with Dr PSN Menon," the doyen of Pediatric Endocrinology —was organized by the Dept of Pediatrics, GMC Kozhikode, in association with IAP, Kozhikode, on 15/02/2026. Postgraduates presented endocrinology cases, which included short stature, hypothyroidism, ambiguous genitalia, neonatal diabetes, syndromic obesity, VDDR, and more.

Dr PSN Menon shared his vast years of expertise, offering practical solutions to many dilemmas in case management. He emphasized a multidisciplinary approach for complicated cases, and all the discussions were truly eye-opening. Drs Vijayakumar M, Riaz I, Mohandas Nair, Rajesh TV, Reetha, and Dhanya Soodhana actively participated in the clinical discussions, including aspects of genetic evaluation as well. The event was attended by around 40 pediatricians.

INAUGURATION OF DIGITAL INTEGRATED CLINIC FOR CHILDHOOD ENDOCRINOLOGY (DICCE), KGMU, LUCKNOW

Arpita Bhriguvanshi, *KGMU, Lucknow*

The inauguration of DICCE was held in the Dept of Pediatrics, KGMU, Lucknow, under the aegis of the Pediatric Endocrinology Unit and Centre of Excellence for Type 1 Diabetes (T1D). Digital platforms can significantly strengthen pediatric endocrine care by enabling continuous follow-up, timely intervention, and sustained family support beyond routine OPD visits, especially for children with T1D. This initiative aims to strengthen continuity of care beyond OPD visits, for children with endocrine disorders, particularly T1D, through digital follow-up, timely advice, and sustained family support. The program, organized with the blessings of Hon'ble Vice-Chancellor Prof (Dr) Soniya Nityanand, with Prof Virendra Atam, Dean Academics, gracing the occasion as Chief Guest, was attended by faculty, residents, staff, collaborating partners, and delegates from the Ministry of Foreign Affairs, Denmark. Support for the initiative was provided by Cordia Healthcare/Vcare.

AN AWARENESS ARTICLE ON OBESITY

Priti Phatale, *Pediatrician & Childhood Obesity Specialist, & Hemant Phatale, Endocrinologist, Chhatrapati Sambhaji Nagar*

On the occasion of World Obesity Day, an article By Dr Priti Phatale and Dr Hemant Phatale, titled "*Obesity: The Woman — Mother of Two Generations*" was published on 5th March in the renowned regional daily newspaper ***Divya Marathi***, which covers almost three lakhs population in 25 talukas in three major districts, in rural Maharashtra. The aim was to disseminate scientific perspective and social reality about childhood obesity, especially in girls, bridging the gap between complex metabolic science and grassroots health awareness. The

article emphasized the need to redefine obesity, not merely as an individual aesthetic concern, but as a critical intergenerational health determinant affecting maternal and offspring outcomes. It underscored the critical role of maternal metabolic health as a primary determinant of long-term health trajectories for the next generation, highlighting the biological link between maternal obesity and offspring wellness.

An **awareness campaign** on "*Securing the Future: Intergenerational Wellness & Metabolic Priming*" was conducted at Sharda Mandir Girls' High School (Centenary Institution), in Chhatrapati Sambhaji Nagar (formerly Aurangabad), to commemorate World Obesity Day. This high-impact Nutritional and Lifestyle Intervention aimed to mitigate the rising trajectory of childhood obesity and associated future consequences.

The session provided evidence-based clinical insights into the following metabolic regulators:

Nutritional Precision: Transitioning from high-calorie, low-nutrient "junk food" to a balanced, macro-& micro nutrient-rich diet.

Physical Activity: its role in maintaining insulin sensitivity & healthy BMI.

Circadian Hygiene: The critical link between adequate, timed sleep and hormonal balance (Ghrelin/ Leptin regulation).

Digital Detox: Reducing sedentary behavior and the triggers of "blue-light" exposure on metabolic health.

Pledge: to adhere to a healthy life style, with reduced screen time and proper sleep hygiene, and to contribute towards building a healthy nation, was taken by all at the conclusion of the session.

Conducted by Dr Priti Phatale, Dr Sandhya Kondpalle (pediatric endocrinologist) and Dr Vinod Totla (pediatrician), it was attended by adolescent girls of 8th & 9th standard, the Principal, Vice Principal, teaching and non-teaching staff, and administrators of the school, and a few parents, and was well appreciated.

UPDATE ON PEDIATRIC METABOLIC DISORDERS AND DIABETES

Aashima Dabas, *Professor, Dept of Pediatrics, Maulana Azad Medical College and Lok Nayak hospital, New Delhi*

The third update on Pediatric Metabolic Disorders & Diabetes was held on 13th March at MAMC. The scientific program included deliberations from Drs Vandana Jain, Ravindra Kumar, Medha Mittal, Deepika Harit, Preeti Singh, Sonia Makhija and Suchit Gupta. The principles of management of pediatric obesity including referral pathways were discussed. The training in pediatric diabetes included basics of medical nutrition therapy, glucose monitoring, insulin therapy and management of DKA. The program was attended by 50 pediatric trainees and young faculty and appreciated by all.

IDEAL CORNER

Shruti Arora, *Ayurveda practitioner, IDEALite/ Certified Diabetes Educator*

Run Miles, Bring Smiles: 5K T1D Fundraiser in Bangalore | 18 January

A 5K run held in Bangalore on 18th Jan brought together children with T1D from KIER and Indira Gandhi Hospital for a meaningful fundraiser. The initiative was spearheaded by IDEAL faculty Dr Santhosh Olety and Dr Vani HN, and IDEALites Ms Sharanya and Ms Shruthi. They were joined by Dr Swaminathan (Idhayangal Trust, Coimbatore). Participants completed the run with enthusiasm and careful planning. All children maintained stable blood glucose

levels throughout, with no hypoglycemic events—highlighting excellent preparedness. The kids set the pace, inspiring everyone involved. Happiest Minds contributed ₹10 lakh towards T1D support.

MADHU RAKSHA App Open House Strengthens T1D Community Engagement | 21 January

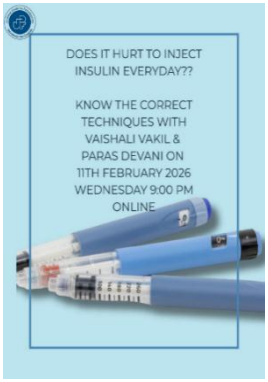
The MADHURAKSHA App Open House, a virtual session hosted by Empower T1D on 21st Jan for the T1D community, began with an introduction to the app by **Dr Tejas Limaye** and **Dr Manisha Gupta**, followed by an open mic discussion led by **Dr Amit Kumar Dey, Dr Rutul Gokalani,** and **Ms Riddhi Modi**, encouraging shared experiences and dialogue.

App Highlights: The Madhuraksha app is free, and designed as a practical tool for individuals with T1D and caregivers. It offers stepwise guidance on key T1D care practices, along with built-in calculators for insulin dosing and carb counting. It provides content in Marathi, Hindi, and English; includes FAQs and expert resources for reliable support; and is regularly updated.

Online Session: "Decoding Protein" by JDF Mumbai | 28 January

JDF Mumbai launched its first online session of the year with an engaging talk on *"Decoding Protein"* by **Ms Sheryl Salis** on 28th Jan. Ms Salis simplified key concepts around protein sources, requirements, and their role in overall health, making the session practical and easy to apply. The initiative set a positive tone for the year ahead, focusing on learning, connection, and empowerment within the community.

Confident Injections Start Here | Insulin Injection Techniques | 11 February



An interactive and lively online session on insulin injection techniques was conducted on 11th Feb by IDEALites **Ms Vaishali Vakil** and **Mr Paras Devani**, focusing on making injections easier, safer, and more effective. The session offered practical, real-life tips that helped participants build confidence in insulin administration.

A key highlight was the emphasis on the mental health aspect of diabetes care. Participants were encouraged to view insulin as life-giving rather than pain-causing, and to be calm and relaxed during injections, as children often mirror caregivers' emotions. The session was well received for combining technical guidance with emotional awareness, making diabetes care more positive and empowering.

JDF Series on "Smart Insulin Adjustments for T1 Families" | Part 1: 25 February & Part 2: 11 March 2026

JDF conducted a two-part online session on *"Smart Insulin Adjustments for T1 Families"* led by **Dr Aspi Irani** and **Dr Anuja Pethe**, aimed at helping families better understand and optimize insulin use. **Part 1** introduced participants to identifying patterns in glucose trends and making informed insulin adjustments. The session emphasized practical approaches to interpreting readings for improved day-to-day management.

Part 2 built on the first session as an interactive follow-up. The speakers addressed participant queries, clarified doubts, and reinforced key concepts. A key highlight was the live review of selected participants' 14-day glucose data, offering hands-on, real-time learning.

The sessions provided actionable insights and strengthened participants' confidence in making informed insulin adjustments in daily care.

TRAINEES SECTION

***Aashima Dabas**, Professor, Maulana Azad Medical College, New Delhi*

Please answer the questions below on Puberty. Correct answers and individual quiz scores will be mailed to the respective email address after the quiz closes.

https://forms.gle/6VUdF6MSgCEC9kMUA

Last Date 10th April 2026

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