CAPE News

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

SEPTEMBER 2025
Volume 29 - Issue 3

CONTENTS

THYROID DISORDERS

Next Issue: Pediatric Diabetes

To follow official ISPAE social accounts, click the icons below

JUNE 2025
Volume 29 - Issue 2

CAPE News | ISPAE

EDITOR'S MESSAGE

Dear Readers,

Greetings from the CAPE News Editorial team.

We are delighted to bring yet another issue, this time on thyroid disorders. It is very exciting to work with proactive EB members of CAPE News Board, who have enthusiastically discussed topics like graves disease, endocrine disrupting compounds, comprehensive assessment of thyroid function, and a new drug Linorma. Our "Interview of a Stalwart" is with Prof. Raghupathy, who has done pioneering work in the area of newborn thyroid screening, and pediatric endocrinology in general. PedEndoScan has articles to keep us up to date. The work done by the IDEAL community and BEST program is exemplary.

The theme of the next issue is "*Pediatric Diabetes*". We look forward to your contributions.

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

Regards,

Nikhil Lohiya,

Team CAPE News

JUNE 2025
Volume 29 - Issue 2

CAPE News | ISPAE

ISPAE PRESIDENT- MESSAGE

Dr Anurag Bajpai- on behalf of ISPAE 2025-2026

Dear friends,

It is great to connect with you through this wonderful issue of CAPE News. This issue's theme of thyroid disorders is comprehensive, spanning the entire spectrum of thyroid disorders from thyrotoxicosis to congenital hypothyroidism and thyroid nodules. Hearty congratulations to the CAPE News Editorial Board for curating such a wonderful issue. Your work strengthens our collective capacity to deliver better pediatric endocrine care.

I take pleasure to inform that the ISPAE Working Groups formed under the 2025 Presidential Plan are currently working on developing consensus statements, registries, and learning modules. These efforts will culminate in dedicated sessions at our forthcoming ISPAE meeting, ensuring that outputs quickly translate into teaching and practice. I have the privilege to announce the launch of ISPAE CARE initiative, the flagship program of ISPAE working group. ISPAE CARE would be a compendium of concise, evidence-graded clinical algorithms tailored to pediatric endocrinology in India. It aims to standardize decision-making across diverse practice settings and provide quick, point-of-care guidance for trainees and practitioners. The first set of algorithms are under development, with use planned in busy clinics. The ISPAE working groups are currently working on multiple guidelines including DSD, congenital hypothyroidism and Type 1 Diabetes. The membership for the groups would be opened soon to all members to allow contribution from across the country.

I look forward to meeting all of you at the forthcoming ISPAE meeting in Nagpur to join us for a wonderful scientific, cultural and social extravaganza. I wish to express gratitude to all of you for providing ISPAE its momentum and meaning. Together, we will continue to raise standards of care for children and adolescents with endocrine disorders across India.

Warm regards,

Dr Anurag Bajpai.

Welcome New Members

Life Members	Associate Members	
• Santhosh KK, Thiruvananthapuram • Rajshree Rajurkar, Bhilai • Sudha Ratna Prabhu, Chennai • Rallabandi Keerthi Anushka, Kakinada • M Vigneshwar, Karur	• Pandit Raghavendra Bhalchandra, Mumbai • Sidharth Raghu, Bengaluru • L Chandramauli, Chennai • Anvith Sherwin Pinto, Chikmagalur • Sumod AS, Irinjalakuda • Sudeshna Sarkar, Kolkata • Abhijeet Jawanjal, Akola • Archana MH, Mumbai • Rajesh Moganty, Tanuku	• Alina Balkrinan, Alappuzha • Shambhavi Joshi, Pune • Lasy Sri Meenakshi D, Krishnagiri • Kavita Gupta, Nagpur • Malathi V Bengaluru • Harish S, Chennai • Jissmariya Jaison M, Thrissur • Aravindh A, Chennai

WINNERS- June 2025 Quiz

Dr Shyam Sundar
Fellow, Pediatric Endocrinology, Christian Medical College, Vellore

Dr. Vivek Kumar Athwani
Assistant Professor, Pediatrics, SK Government Medical College. Sikar, Rajasthan

Congratulations!

JUNE 2025
Volume 29 - Issue 2

CAPE News | ISPAE

REVIEW OF THE 2022 EUROPEAN THYROID ASSOCIATION GUIDELINES FOR PEDIATRIC GRAVES' DISEASE: EVIDENCE BASE, CLINICAL IMPLICATIONS, AND COMPARISON WITH 2016 ATA GUIDELINES

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

The 2022 European Thyroid Association (ETA) guidelines provide updated, evidence-based recommendations for the management of pediatric Graves' disease. These guidelines outline protocols that are tailored to children and adolescents, reflecting differences from adult treatment strategies. This review discusses the main recommendations of the guidelines, the supporting evidence, and significant differences from the 2016 American Thyroid Association (ATA) Guidelines.

Disease Burden and Demographics

Pediatric Graves' disease (GD) is a rare autoimmune disorder, affecting about 4.58 per 100,000 children annually, and just 1-2.9 per 100,000 under age 15y. It is much more common in girls, with a 3.4:1 ratio that rises sharply in adolescence. Childhood cases make up only 5% of all Graves' disease, highlighting its rarity and the need for specialized care[1].

Clinical Presentation and Diagnostic Considerations

The guidelines note that pediatric GD can present with subtle signs, which may delay diagnosis. Clinicians are advised to consider behavioral changes, reduced academic performance, accelerated growth, and bone maturation as possible indicators, appearing before typical thyrotoxic symptoms. When suspected, diagnosis requires measurement of serum thyroid function tests (TFT) - free T4 (FT4), free T3 (FT3), and TSH. Elevated FT3 levels are more sensitive indicators of overt hyperthyroidism than FT4. Crucially, the guidelines recommend measuring TSH receptor antibodies (TSHRAb) in all pediatric patients with suspected hyperthyroidism. Sensitive bioassays detect TSH stimulating antibodies (TSAb) in 94% of children with GD, compared to 87.9% with traditional TBII tests, indicating improved diagnostic accuracy with newer methods[2,3]. In case of high clinical suspicion but thyroid antibody negativity, repeat testing is recommended after a few weeks. If autoimmune markers continue to be negative, it is advisable to consider further evaluation with thyroid ultrasonography, incorporating Doppler blood flow analysis, as well as scintigraphy - preferably utilizing Tc-99m-pertechnetate. Ultrasonography is preferred, to avoid radiation exposure.

Treatment Recommendations

First-Line Therapy Recommendations:

The guidelines strongly recommend either carbimazole (CBZ) or methimazole (MMI) as first-line therapy, completely avoiding propylthiouracil (PTU) in pediatric patients. Rivkees and Mattison's comprehensive analysis[4] of PTU-associated hepatotoxicity, documenting severe liver failure in 1 in 2,000-4,000 children treated with PTU, with reversible liver injury in at least 1:200 patients supports this stand.

Dosing Strategies and Treatment Duration

Initial dosing recommendations are stratified by disease severity, with MMI doses ranging from 0.15-0.5 mg/kg daily and CBZ doses from 0.25-0.75 mg/kg daily. For mild to moderate disease (FT4 $\leq$ 35 pmol/L or FT3 $\leq$ 12 pmol/L), lower starting doses of 0.15 mg/kg MMI or 0.25 mg/kg CBZ can be used, while more severe cases may require higher initial doses. Both medications can be administered once daily, which significantly improves compliance.

Dose Titration Versus Block-and-Replace

The guidelines strongly favor dose titration (DT) over block-and-replace (BR) approaches. The Wood 2020 randomized trial demonstrated no significant difference in biochemical control (TSH: 63.8% vs. 60.2%), with more

adverse events (all neutropenia cases) in the BR group. DT offered better FT4 control (85.7% vs. 79.2%) and higher remission rates at 4 years (10 vs. 6 patients)[5].

Treatment Duration: A Paradigm Shift

The most significant change in the 2022 guidelines is the recommendation for prolonged antithyroid drug (ATD) therapy, with treatment duration of at least 3 years and potentially 5 years or more, especially for patients with a low chance of remission due to factors like young age, male gender, large goiter, or high FT4 and TSHRAb levels at onset. The evidence supporting extended treatment is robust, with remission rates increasing from 24.1% after 1.5-2.5 years to 43.7% after 5-6 years, reaching 75% after 9 years of continuous therapy[1].

Monitoring and Safety Considerations

Clinical Monitoring Schedule
During the initial 3 months, patients should be evaluated every 4 weeks, with monitoring frequency then reduced to every 2-3 months, based on clinical stability. Key laboratory assessments include TFT, complete blood count, and liver function tests at baseline and as clinically indicated. Monitoring side effects is essential, as around 15% of children experience adverse events. Minor reactions, like cutaneous reactions, affect 10%, while serious issues such as agranulocytosis are rare (2-3 per 100,000) but require stopping ATD and urgent care[1]. The guidelines emphasize patient and family education regarding warning signs such as fever, sore throat, or jaundice that warrant immediate medical evaluation. Immediate cessation of ATD is recommended for low neutrophil count (below 0.5 (x 10^9/L) or raised transaminases (> 3 times the upper limit), with frequent monitoring in cases where neutrophil counts are 0.5-1.5.

TSHRAb Monitoring for Treatment Decisions
The guidelines emphasize the critical role of monitoring TSHRAb, which serve as the primary predictor of remission likelihood, in treatment decision-making. Normalization of TSHRAb is essential before considering treatment discontinuation - ATD should not be discontinued if TSHRAb levels remain elevated. The antibody levels typically decline by a median of 90% after 3 years of treatment.

Definitive Treatment Options

Radioactive Iodine Therapy
The guidelines provide nuanced age-stratified recommendations for radioactive iodine (RAI) therapy, with strong contraindications for children under 5 years and cautious use between ages 5-10 years only when surgery is not feasible. For children over 10 years, RAI becomes an acceptable option with specific technical considerations.

Key RAI Recommendations:
The primary objective should be complete thyroid ablation, as opposed to merely achieving euthyroidism, in order to reduce the risk of relapse and address potential malignancy concerns. Dosing should be individualized: 15 MBq (0.4 mCi) per gram of thyroid tissue can be administered in the absence of dosimetry; or dosimetry-guided therapy is utilized to deliver at least 300 Gy to the thyroid. ATD should be discontinued 3–7 days before RAI administration. Absolute contraindications for RAI therapy include pregnancy, breastfeeding, children under 5 years of age, and active Graves orbitopathy (GO). Relative contraindications include patients aged 5–10 years, those with inactive GO, and individuals with large goiters that may necessitate repeated treatments.

Long-term safety data from pediatric RAI studies spanning up to four decades show no increased malignancy or fertility problems. The theoretical radiation risks in very young children remain the primary consideration for the age restrictions.

Total Thyroidectomy
Total thyroidectomy is strongly recommended over subtotal thyroidectomy to minimize recurrence risk, with no reported difference in complication rates between the two approaches. Pre-operative preparation is crucial, including achieving euthyroidism with ATD, and ensuring vitamin D repletion to reduce post-operative risk of hypocalcemia. Levothyroxine replacement should be initiated within days of surgery.

The guidelines strongly recommend surgery - after careful patient selection, by high-volume, skilled thyroid surgeons to minimize post-operative morbidity. Surgical outcomes show very low mortality (<0.1%) but notable risks: transient hypocalcemia (22.2%), permanent hypoparathyroidism (2.5%), recurrent laryngeal nerve injury which may be (5.4%), or permanent (0.4%)[6].

Management of Graves' Orbitopathy
GO occurs in 27-63% of children with GD, similar to adult frequencies, but the clinical presentation differs, with inflammatory features being less severe in children. The most common manifestations are eyelid retraction (72%) and proptosis (53%), while soft tissue inflammation is less frequent (22%).

Most pediatric GO can be managed conservatively, with artificial tears for lagophthalmos, Selenium supplementation in selenium-deficient areas and intravenous corticosteroids in rare moderate to severe cases of active orbitopathy. Surgical management, when necessary, should generally be deferred until facial skull growth is complete, except for decompression surgery, which may be performed earlier if needed.

Thyroid Cancer Risk Considerations
The guidelines note a slightly increased risk of differentiated thyroid cancer in children with GD, as seen in adults. All palpable thyroid nodules in children and adolescents with GD should undergo ultrasound evaluation, with suspicious sonographic findings warranting either fine needle aspiration cytological assessment or proceeding directly to total thyroidectomy.

Autoimmune Evolution
Long-term follow-up studies indicate that approximately one-quarter of patients in remission eventually develop subclinical or overt hypothyroidism due to evolution toward Hashimoto's disease, necessitating lifelong thyroid function monitoring[7].

Future Directions and Emerging Therapies
While the guidelines acknowledge emerging biological therapies such as rituximab and Iscalimab (anti-CD40 antibody), there is currently insufficient evidence to recommend these agents in pediatric GD. Future research directions include developing more targeted immunotherapies and improving prediction models for treatment response and remission.

Comparison with ATA 2016 Guidelines
The comparison between ETA 2022 and ATA 2016 guidelines reveals several significant philosophical and practical differences:

Treatment Duration
ETA 2022 marks a major shift by recommending much longer initial medical treatment (3 to 5 years or even more), as evidence suggests extended therapy improves remission rates, while ATA 2016 recommended treatment duration of 12-18 months[8].

Drug Selection and Dosing
ETA 2022 has stronger prohibition against PTU use, stating it "should not be used" due to hepatic failure risk, while ATA 2016 had recommended limiting use of PTU to specific situations due to hepatotoxicity concerns.

Diagnostic Approaches
ETA 2022 strongly recommends TSHRAb testing and monitoring in all children with hyperthyroidism, whereas ATA 2016 offered a more case-dependent approach.

RAI Age Restrictions
Both guidelines limit RAI use in young children, but ETA 2022 specifies age groups more clearly and more strongly recommends surgery for those aged 5-10 years when definitive treatment is required.

Treatment Strategy Preference
ETA 2022 states a clear preference for dose titration over block-and-replace approach, while ATA 2016 considered both approaches acceptable.

Conclusion
The 2022 ETA guidelines offer an evidence-based framework for managing pediatric GD, incorporating recent advances and emphasizing individualized care. They aim to improve outcomes and quality of life for young patients while reducing treatment-related risks.

References

1. Mooij CF, Cheetham TD, Verburg FA, Eckstein A, Pearce SH, Léger J, van Trotsenburg AP. 2022 European Thyroid Association Guidelines for the management of pediatric Graves' disease. European Thyroid Journal. 2022 Feb 1;11(1).
2. Ohye H, Minagawa A, Noh JY, Mukasa K, Kunii Y, Watanabe N, Matsumoto M, Suzuki M, Yoshihara A, Ito K, Ito K. Antithyroid drug treatment for Graves' disease in children: a long-term retrospective study at a single institution. Thyroid. 2014 Feb 1;24(2):200-7.
3. Diana T, Brown RS, Bossowski A, Segni M, Niedziela M, König J, Bossowska A, Ziora K, Hale A, Smith J, Pitz S. Clinical relevance of thyroid-stimulating autoantibodies in pediatric Graves' disease—a multicenter study. The Journal of Clinical Endocrinology & Metabolism. 2014 May 1;99(5):1648-55.
4. Rivkees SA & Mattison DR. Ending propylthiouracil-induced liver failure in children. *New England Journal of Medicine* 2009 **360** 1574–1575.
5. Wood CL, Cole M, Donaldson M, Dunger DB, Wood R, Morrison N, Matthews JNS, Pearce SHS & Cheetham TD. Randomised trial of block and replace vs dose titration thionamide in young people with thyrotoxicosis. *European Journal of Endocrinology* 2020 **183** 637–645.
6. Zaat AS, Derikx JPM, Zwaveling-Soonawala N, van Trotsenburg ASP & Mooij CF. Thyroidectomy in pediatric patients with Graves' disease: a systematic review of postoperative morbidity. European Thyroid Journal 2021 10 39–51.
7. Wiersinga WM. Graves' disease: can it be cured?. Endocrinology and Metabolism. 2019 Mar 21;34(1):29.
8. Ross DS, Burch HB, Cooper DS, Greenlee MC, Laurberg P, Maia AL, Rivkees SA, Samuels M, Sosa JA, Stan MN, Walter MA. 2016 American Thyroid Association guidelines for diagnosis and management of hyperthyroidism and other causes of thyrotoxicosis. Thyroid. 2016 Oct 1;26(10):1343-421.

THE RIGHT OF EVERY NEWBORN: UNIVERSAL CORD BLOOD TSH SCREENING: SWITCHING GEARS FROM COMPLEX TO SIMPLE

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

All high-income countries (HIC) and several low- and middle-income countries (LMIC) have mandatory universal newborn screening (UNBS) for congenital hypothyroidism (CH)[1,2] because of its undoubtedly favorable cost-benefit ratio[3]. As pediatric endocrinologists we struggle when coping with the preventable tragedy of CH being diagnosed late, resulting in intellectual disability and lifelong suffering for an entire family. Unfortunately, 50 years after NB thyroid screening was started in 1974, less than 30% are screened worldwide, while in India the figure is a disgraceful 3%[4]. This is because heel prick dried blood spot (DBS) testing presently preferred is a logistic nightmare for LMIC, which usually do not have infrastructure needed. Nearly 10 years, the multi-center study to assess incidence rates conducted by Indian Council for Medical Research (ICMR) could only succeed in screening 73.2% babies. Even in project mode one-fourth were missed[5]. Their recommendation to urgently implement universal screening remains a dream. Even in the newborns screened by DBS, the thyroid surge can pose problems.

Cord Blood (CB) TSH screening is a practical alternative which continues in Singapore,[6] Finland, and indeed in many hospitals in India[7] for over three decades now. It fits in well with the early discharge policies of most birthing centers in India. The centers using this approach easily achieve over universal screening, with low recall rates (CB vs. DBS in 2 large studies were 0.04% vs. 1.68%[8] and 0.004% vs. 0.6%[9]). CB TSH screening has become even easier and more practical due to major advances over the years:

(1) Thyroid hormone testing is locally available: simple, accurate and inexpensive: across the world.
(2) Turn-around time for thyroid hormone testing has decreased to less than 1 day.

Therefore, CB liquid sample, easily, inexpensively, and non-invasively collected and sent for TSH to a reliable local lab, means the TSH report could be available before the NB is discharged even in early discharge scenarios. This makes it possible to take clinical decisions with hardly any recall. Based on our experience of universal screening since 2006, we have proposed **Simplified, Decentralized, Universal NBS with cord blood TSH, with report stated in the discharge summary**[10]. This strategy involves very few retests, and very rare recalls (which are difficult), and can **maximize screening, reduce time and enable early detection and replacement**. Focused confirmatory testing and follow-up with efficient use of resources is particularly important in resource limited settings.

The deep penetration of mobile telephony overcomes an earlier hurdle[11], making it possible to track, contact and maintain contact with even the most marginalized families (poor, urban slums, immigrant camps).

This approach needs no major organizational upheavals or political support; just widespread awareness among pediatricians and other HCP attending deliveries. It need not conflict with any pre-existing or planned DBS testing for multiple conditions, which should be continued while aiming for 100% coverage with Universal CBTSH testing.

If we pediatric endocrinologists, without waiting endlessly for government mandates, start persuading our pediatric and obstetrician colleagues to make screening all newborns' cord blood for TSH a part of routine deliveries, we would be able to improve the situation significantly, immediately resulting in increased rates of screening, and early detection of affected babies.

References:

1. Mahachoklertwattana P, Phuapradit W, Siripoonya P, Charoenpol O, Thuvasethakul P, Rajatanavin R. Five-year thyrotropin screening for congenital hypothyroidism in Ramathibodi Hospital. J Med Assoc Thai. 1999 Nov;82 Suppl 1:S27-32.
2. Al-Jurayyan NAM, Al-Nuaim AA, El-Desouki MI, et al. Neonatal screening for congenital hypothyroidism in Saudi Arabia: results of screening the first 1 million newborns, Screening, 1996, 4 (4): 213-220.
3. Tiwari V, Husain N, Awasthi N, Pandey C. Cost-Effectiveness Analysis of Congenital Hypothyroidism in Neonates Born in Uttar Pradesh: A Pilot Study. European J Pharm Med Res. 2017, 4. 394-399.
4. Anne RP, Rahiman EA. Congenital hypothyroidism in India: A systematic review and meta-analysis of prevalence, screen positivity rates, and etiology. Lancet Reg Health Southeast Asia. 2022 Jul 14;5:100040.
5. ICMR Task Force on Inherited Metabolic Disorders. Newborn Screening for Congenital Hypothyroidism and Congenital Adrenal Hyperplasia. Indian J Pediatr. 2018; 85, 935–940.
6. Rajadurai VS, Yip WY, Lim JSC, Khoo PC, Tan ES, Mahadev A, Joseph R. Evolution and expansion of newborn screening programmes in Singapore. Singapore Med J. 2021 Jul;62(1 Suppl):S26–35. doi: 10.11622/smedj.2021073. PMCID: PMC9053327.
7. Paul PG, Rebekah G, Korula S, et al. Optimizing Cord Blood Thyroid Stimulating Hormone Cutoff for Screening of Congenital Hypothyroidism - Experience from Screening 164,000 Newborns in a Tertiary Hospital in India. Indian J Endocrinol Metab. 2021 Jul-Aug;25(4):348-353.
8. Al Juraibah F, Alothaim A, Al Eyaid W, AlMutair AN. Cord blood versus heel-stick sampling for measuring thyroid stimulating hormone for newborn screening of congenital hypothyroidism. Ann Saudi Med. 2019 Sep-Oct;39(5):291-294.
9. Alameer S, Althobaiti E, Alshaikh S, et al. Diagnostic comparison between cord blood and filter paper for the screening of congenital hypothyroidism. J Clin Lab Anal. 2022 Jan;36(1):e24149.
10. Gaur DS, Vij V, Virmani A, Jevalikar G, Malik M. Decentralized Cord Blood TSH Screening: Lessons from a Tertiary Care Center in North India. Indian Pediatr 2025 Apr; 62: 276-282.
11. Desai MP, Colaco MP, Ajgaonkar AR et al. Neonatal screening for congenital hypothyroidism in a developing country: problems and strategies. Indian J Pediatr. 1987; 54, 571–581.

JUNE 2025
Volume 29 - Issue 2

CAPE News | ISPAE

Mini Review

ENDOCRINE-DISRUPTING CHEMICALS AND THYROID HEALTH

Dhanya Soodhana, *Pediatric & Adolescent Endocrinologist, Aster MIMS, Kozhikode, Kerala.*

Endocrine disruptors (EDs) are defined as exogenous substances or mixtures that interfere with hormone action, thereby altering the endocrine system's physiological functions. They can mimic endogenous hormones such as estrogens, androgens, or thyroid hormones, or modify hormone metabolism, receptor binding, and downstream signaling. The thyroid axis is a particularly sensitive target because thyroid hormone (TH) homeostasis is essential for fetal growth, neurodevelopment, and adult metabolic regulation. Disruption of this system may contribute to the increasing prevalence of thyroid disease, including thyroid cancer and autoimmune thyroiditis, as well as neurodevelopmental impairments.

Routes of Exposure

Humans encounter thyroidal Endocrine Disrupting Chemicals (EDCs) through multiple pathways:

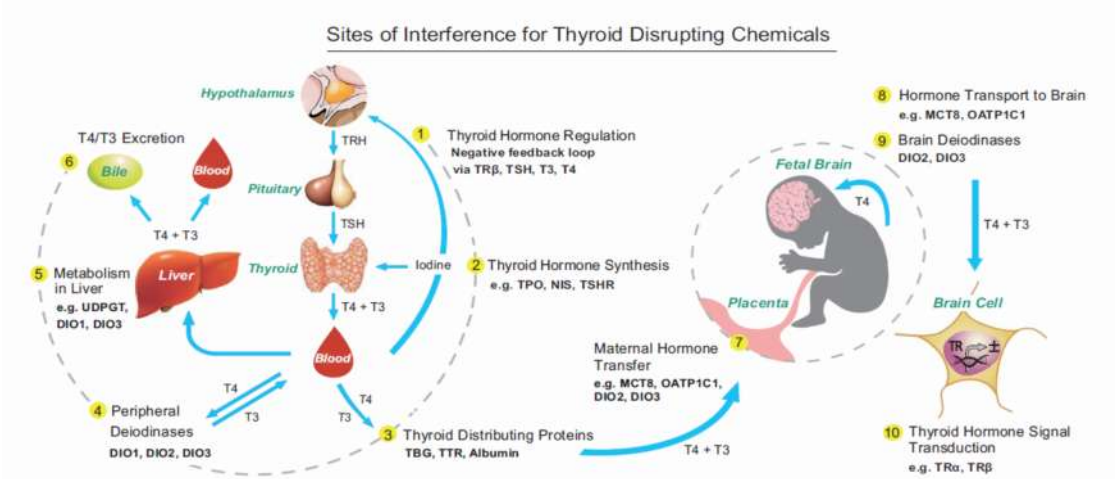
- **Ingestion** of contaminated food and water.
- **Inhalation** of airborne particulates and volatile chemicals.
- **Dermal absorption** through contact with consumer products.
- **Maternal–fetal transfer**, with Thyroid Disrupting Chemicals (TDCs) crossing the placenta and being detected in amniotic fluid, cord blood, and breast milk.

A wide variety of TDCs have been identified. Exposure to known TDCs is ubiquitous, and many likely remain unidentified. The sources of exposure include contaminated drinking water, air pollution, pesticides and agricultural chemicals, flame retardants, cleaning supplies, personal care products, food additives and packaging materials, coatings and solvents, and medical products and equipment. Human biomonitoring confirms widespread exposure, with detection of TDCs such as pesticides, plasticizers, flame retardants, alkylphenols in biological samples from mothers, fetuses, and neonates.

Mechanisms of Thyroidal Disruption

TDCs interfere with thyroid function at multiple levels:

1. **Synthesis**: inhibition of thyroid peroxidase and iodide uptake.
2. **Transport**: displacement of thyroid hormones from binding proteins.
3. **Metabolism**: induction of hepatic enzymes accelerating T4 clearance.
4. **Receptor binding**: agonistic or antagonistic activity at thyroid receptors.
5. **Epigenetic alterations**: changes in DNA methylation and non-coding RNAs, potentially leading to thyroid cancer, autoimmunity, or fetal thyroid dysfunction.



Understanding the health effects of TDCs has been challenging because individuals may have multiple concomitant EDC exposures and many potential EDCs are not yet well characterized. Because of the importance of TH for brain development in early life, pregnant women and young infants are particularly vulnerable to the effects of environmental thyroid disruption. The difference in exposition time points during lifetime is a critical factor in the evaluation of EDC actions. The age of exposure is the first conditioning factor, implying the maternal exposure as well; moreover, the variable latency between the exposure and the manifestation of the effect needs to be taken in to consideration. The thyroidal effects of some EDCs may be exacerbated in iodine-deficient individuals, those with thyroid autoimmunity, and those with mutations in deiodinase genes. Differential exposures to EDCs may exacerbate health disparities in disadvantaged groups.

Industrial Chemicals and Pesticides as Thyroid-Disrupting Chemicals (TDCs)

Category	Examples	Sources/Uses	Mechanism of Thyroid Disruption	Health Impacts
Industrial Chemicals	Polychlorinated Biphenyls (PCBs)	Formerly used in pesticides and industrial applications; persist in environment, exposure via food chain	Alter TH metabolism rather than synthesis; associated with changes in T3/rT3 ratio; hydroxylated congeners correlated with altered T4 levels in infants	Cognitive impairment; reduced T4 in animal studies
	Polybrominated Diphenyl Ethers (PBDEs)	Flame retardants in plastics, fabrics, paints, electronics, mattresses	Structural similarity to T4 → interference with TH binding and signalling; lipophilic → accumulate in tissues	Thyroid dysfunction; potential developmental neurotoxicity
	Perchlorate	Rocket fuel, airbags, fertilizers, food contact materials; contaminates water, milk, and food	Inhibits sodium-iodine symporter (NIS) → reduced iodide uptake in thyroid and breast tissue	Lower IQ in children of mothers with high perchlorate exposure
	Bisphenol-A (BPA) & Phthalates	Plastics, toys, cosmetics, food packaging, building materials	Weak estrogenic activity; interfere with thyroid receptor signalling and TH transport proteins	Altered THe levels; developmental and reproductive toxicity
Pesticides	Organochlorines (OCs)	Agricultural insecticides and fungicides; persistent pollutants	Structural similarity to T3/T4 → mimic TH activity by binding receptors	Thyroid dysfunction; potential contribution to thyroid cancer and autoimmunity
	Insecticides, Fungicides, Fumigants	Crop protection and pest control	Multiple mechanisms: enzyme induction, interference with TH synthesis and metabolism	Disruption of thyroid homeostasis; potential neurodevelopmental impacts

The incidence of thyroid cancer has been steadily increasing in recent decades worldwide. Although early or incidental detection of smaller tumors due to more advanced and frequent use of imaging technology may partially explain this increase, research has highlighted the potential contribution of exposure to EDCs to this phenomenon. Flame retardants, including polybrominated biphenyls (PBBs) and polybrominated diphenyl ethers (PBDEs), have been widely used in flame retardants in furniture, electrical equipment and other household products. Despite bans since 1970s, these chemicals persist in the environment and human tissues due to long half-lives (10-12 years). They disrupt thyroid function by displacing thyroxine, enhancing metabolism and excretion, and have been linked to cancer, diabetes, neurobehavioral, and reproductive disorders. Similarly, polychlorinated biphenyls (PCBs) persist environmentally and are classified as carcinogens, acting via Aryl Hydrocarbon Receptor (AHR) activation and thyroid disruption. Phthalates and bisphenol A (BPA), common plasticizers, also impair TH homeostasis and can lead to tumorigenesis.

High-throughput in vitro assays and in silico methods that can detect the effects of relevant EDC mixtures are needed. In addition, optimal methods for detecting the effects of TDCs on neurodevelopment need to be developed. Common sense precautions can reduce some thyroidal EDC exposures; however, regulation of manufacturing and drinking water content will ultimately be needed to protect populations.

To conclude, EDCs have been shown to affect multiple hormonal axes, but research remains limited. Differences in study design, population, exposure level and duration, and age range hinder broad conclusions. Industrial chemicals clearly interfere with endocrine function, and because thyroid health is critical for cardiovascular, musculoskeletal, cognitive, and immune systems, there is a pressing need for larger, more standardized studies to generate consistent and reliable data.

References:

1: Diamanti-Kandarakis E, Bourguignon JP, Giudice LC. Endocrine-Disrupting Chemicals: An Endocrine Society Scientific Statement. Endocrine Rev 2009;30(4):293-342.
2: Pearce EN. Endocrine Disruptors and Thyroid Health. *Endocr Pract*. 2024;30(2):172-176.
3: He J, Xu J, Zheng M, et al. Thyroid dysfunction caused by exposure to environmental endocrine disruptors and the underlying mechanism: A review. *Chem Biol Interact*. 2024; 391:110909.
4: Gilbert ME, O'Shaughnessy KL, Axelstad M. Regulation of Thyroid-disrupting Chemicals to Protect the Developing Brain. *Endocrinology*. 2020;161(10): bqaa106.
5: Sun M, Cao X, Wu Y, Shen L, Wei G. Prenatal exposure to endocrine-disrupting chemicals and thyroid function in neonates: A systematic review and meta-analysis. *Ecotoxicol Environ Saf*. 2022; 231:113215.
6: Alsen M, Sinclair C, Cooke P, Ziadkhanpour K, Genden E, van Gerwen M. Endocrine Disrupting Chemicals and Thyroid Cancer: An Overview. Toxics. 2021 Jan 19;9(1):14.

THYROID NODULES IN CHILDREN

Floris Ann Francis, Subramanian Kannan, *Dept of Endocrinology, Diabetes & Metabolism, Narayana Health Hospitals, Bangalore*


Epidemiology and Clinical Setting: About 2% of children have clinically evident thyroid nodules, while up to 5% are detected incidentally. The prevalence is similar in boys and girls below the age of 10 years; beyond this age there is a marked female predominance. Pediatric thyroid nodules have a higher risk of malignancy (19-22%) than adults and often present with locally advanced stages or metastatic disease. Although the risk of recurrence is higher in this age group, long-term outcomes remain good, with more than 98% 30-year disease-specific survival.

Spectrum of Thyroid Lesions

Benign Lesions

- Colloid cysts/adenomas (most common); Cysts (simple or haemorrhagic), Autoimmune/ Hashimoto thyroiditis (pseudo-nodules), Multinodular goiter; Follicular adenomas (macrofollicular & microfollicular adenoma); Hürthle cell adenomas.

Malignant Lesions

- Differentiated thyroid cancer (DTC)
    - Papillary thyroid carcinoma (PTC) > 85% of pediatric thyroid cancer, spreads via lymphatic route.
    - Follicular thyroid carcinoma (FTC) accounts for 8–9% and spreads hematogenously.
- Medullary thyroid carcinoma (MTC) - 4%; mostly associated with MEN2.
- Oncocytic (Hürthle cell) carcinoma – uncommon in childhood.
- Rare: Anaplastic carcinoma, primary lymphoma.

Genetic Syndromes associated with thyroid neoplasms:

- **MEN2A and MEN 2B-** Characterised by MTC. Highest risk is associated with mutations on exon 16 (codon 918) and exon 11 (codon 634).
- **DICER1 syndrome:** Suspected in patients with family history, advanced DTC or follicular nodular disease (FND) and specific histopathology (microfollicular tumors, thick capsules, papillary formations in FND without classic PTC features).
- **Cowden syndrome** (PTEN mutation): Associated predominantly with FTC.
- **Familial Adenomatous Polyposis** (APC mutation): 12% risk of thyroid cancer often cribriform-morular variant PTC with a strong female predominance (80:1).

- **Others**: Carney complex, Werner syndrome, Pendred, Li-Fraumeni syndrome, ataxia-telangiectasia and Bannayan-Riley-Ruvalcaba which include thyroid neoplasms.

Clinical Evaluation of thyroid nodules in children:

- History of radiation exposure, syndromic stigmata, family history of endocrine tumors or early-onset malignancies.
- Physical exam: Thorough assessment of thyroid and cervical lymph nodes.

USG: The corner stone of evaluation of all thyroid nodules: focus should be on suspicious features and not patterns.

- Features of malignancy: Solitary nodule, hypo-echogenicity, solid parenchyma, irregular margins, taller-than-wide shape, microcalcifications, abnormal lymph nodes, enlargement over time.
- Features of benignity: Completely cystic composition, spongiform appearance, echogenicity with comet-tail shadowing.

FNAC: Essential for cytologic diagnosis. FNAC of lymph nodes is more useful than of the nodule itself, as any thyroid follicular cell in a lymph node is abnormal. Thyroglobulin estimation in necrotic lymph nodes is a useful adjunct. Excision biopsy of lymph nodes is to be avoided as it affects subsequent neck dissection in DTC.

Limitations of scoring systems in pediatric thyroid nodules

ACR- TI-RADS missed or delayed the diagnosis in up to 22% of paediatric thyroid cancers, thus, clinical and ultrasonographic features should outweigh size thresholds.

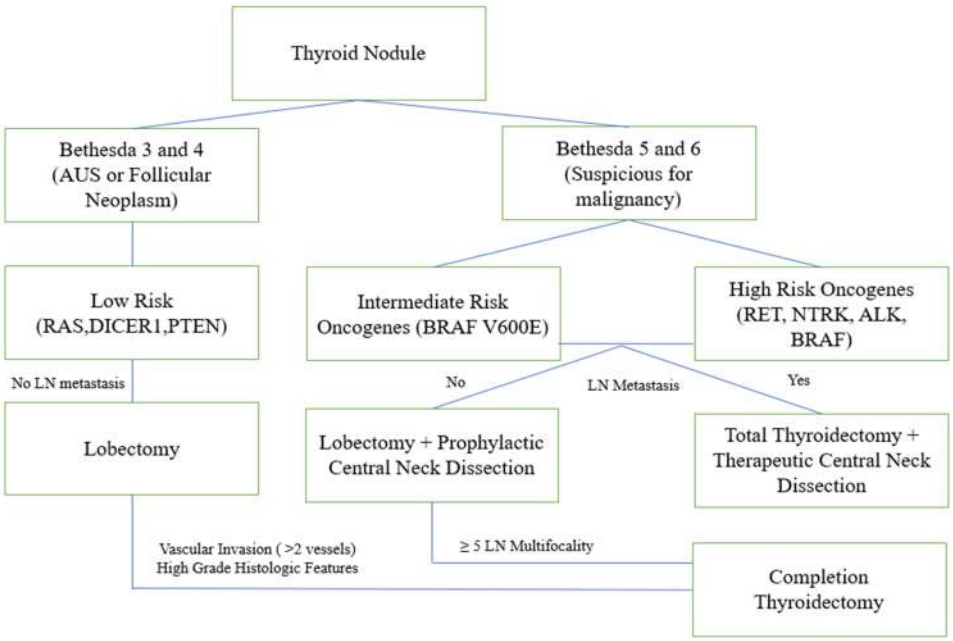
Risk of malignancy in thyroid nodule based on Bethesda Category		
Category	**Pediatric (%)**	**Adult (%)**
Nondiagnostic (Category I)	**5–11**	5–10
Benign (Category II)	**0–3**	0–3
AUS/FLUS (Category III)	**30–45**	6–18
Follicular neoplasm (Category IV)	**30–70**	10–40
Suspicious for malignancy (Cat. V)	**70–85**	45–60
Malignant (Category VI)	**95–99**	95–96

Integrative Genomic Approach

30-35% of pediatric patients have indeterminate cytology. Pre-operative somatic oncogene analysis gives objective data to help predict the risk of thyroid neoplasm, likelihood of invasive behaviour and guide the surgical management.

Three-Tier Genetic Landscape in Pediatric DTC (1)

- Tier 1 – Low risk for invasive behaviour: RAS, DICER1, PTEN, non-V600E BRAF or PAX8-PPARG.
- Tier 2 – Intermediate risk: BRAF V600E.
- Tier 3 – High risk: RET, NTRK, ALK, BRAF fusions



Integrative algorithm of thyroid nodule in children (2)

Conclusion

Thyroid nodules in children carry a high risk of malignancy, often presenting at advanced stages. Accurate diagnosis relies on clinical evaluation, ultrasound imaging, and FNAC of suspicious nodules. Molecular testing is increasingly used to tailor treatment plans. Early detection combined with multidisciplinary care optimise long-term survival while minimizing morbidity and ensuring better long term survival rates.

References:

1. Franco AT, Ricarte-Filho JC, Isaza A, Jones Z, Jain N, Mostoufi-Moab S, et al. Fusion oncogenes are associated with increased metastatic capacity and persistent disease in pediatric thyroid cancers. J Clin Oncol. 2022;40(10):1081–90.
2. Sin-Ting Tiffany Lai, Andrew J Bauer, Approach to the Pediatric Patient With Thyroid Nodules, *The Journal of Clinical Endocrinology & Metabolism*, Volume 110, Issue 8, August 2025, Pages 2339–2352,

DRUG CORNER

Liothyronine (T3)

Nikhil Lohiya, *Dept of Growth & Endocrinology, Silver Lining Pediatric Super Specialty Center, Nagpur*

Liothyronine is synthetic form of the thyroid hormone triiodothyronine, used primarily to treat hypothyroidism. It is available in strengths of 5 mcg and 20 mcg under the brand name Linorma T3 5 mcg or 20 mcg tablets.

Clinical Utility in pediatrics

Liothyronine may be used in hypothyroidism when T4 monotherapy is not effective. It can also be used in emergencies like myxedema coma/ crisis, and in the T3 suppression test.

How Liothyronine Works

Liothyronine T3 replaces the T3 hormone not produced adequately by the thyroid gland, helping to regulate metabolism, energy levels, and various body functions. Unlike standard thyroxine (T4) therapy, T3 acts more rapidly, reaching full effect in 2–3 days.

Uses	Dosage & Administration	Side Effects & Precautions
• Treatment of hypothyroidism • Management of simple goiter • In certain treatments related to thyroid cancer (usually as part of a broader therapeutic plan) • Occasionally, for diagnostic purposes in thyroid function tests.	• Typically initiated at lower doses (e.g., 10–20 mcg, divided into 3 doses given 8 hourly), with adjustments based on blood tests and clinical response. • Taken orally, usually on an empty stomach before breakfast for best absorption. The 20 mcg tablet can be dissolved in water for children, if necessary.	Common side effects can include: • Headache • Nervousness or anxiety • Trouble sleeping • Rapid heartbeat or palpitations • Weight loss • Excessive sweating Most side effects occur at higher than required doses, and generally subside with correct dosing. Rare but serious risks include arrhythmias or heart-related symptoms, especially in those with pre-existing heart conditions.

Warnings	Important Notes
• Should be used cautiously in people with heart problems, uncorrected adrenal insufficiency, bone thinning, or blood clotting issues. • Not recommended for treatment of obesity or in combination with certain weight-loss drugs. • Pregnant or breastfeeding women should consult their doctor prior to use to ensure safety, as thyroid needs change during pregnancy.	• Regular thyroid function tests are necessary to monitor effectiveness and adjust dosage. • Several medications can interact with Linorma, including drugs for high cholesterol, diabetes, depression, and heart conditions. • Cannot stop Linorma abruptly, as symptoms of hypothyroidism may return.

In summary, **Linorma (Liothyronine)** is a fast-acting, effective thyroid hormone replacement therapy, but should be carefully managed under medical supervision to ensure safety and efficacy.

BIOCHEMICAL TESTING IN THYROID DISORDERS TFTs ARE THE NEW CBC: WHY KNOWING THE ASSAY MATTERS

Swathi Padmanaban, *Consultant Pediatric & Adolescent Endocrinologist, Rainbow Children's Hospital and BirthRight, Chennai*

Biochemical testing is central to diagnosing and monitoring thyroid disorders. Technological advances in immunoassays have greatly improved sensitivity, but interpretation requires knowledge of assay design, physiologic variation across age, and sources of analytical interference. This review highlights the major thyroid biomarkers with emphasis on assay performance and clinical interpretation.

Assay & Physiology	Clinical Application	Analytical Pitfalls
Thyroid-Stimulating Hormone (TSH) TSH assays have progressed from **first-generation RIAs** (functional sensitivity ~1 mIU/L) to **second-generation assays** (~0.1 mIU/L), and now to **third-generation immunometric "sandwich" assays** with chemiluminescence/ fluorescence, achieving ~0.01 mIU/L sensitivity. These enable detection of subclinical hyperthyroidism. Modern assays use monoclonal antibodies and biotin–streptavidin systems for capture. While sensitive, these are vulnerable to interference. TSH secretion is circadian, peaking at	• **Congenital hypothyroidism**: Screening programs recall at whole-blood TSH >20–40 mIU/L. Confirmed by TSH >10 mIU/L with low free T4. • **Subclinical hypothyroidism**: Pediatric patients with ≥10 mIU/L are treated; those with 5–10 mIU/L require monitoring, particularly if antibody-positive. • **Hyperthyroidism**: Suppressed TSH (<0.01 mIU/L) is the most sensitive indicator.	• **Biotin interference**: High-dose biotin (common in pediatric metabolic disorders) disrupts streptavidin binding, causing spuriously low TSH in sandwich assays and high TSH in competitive assays. A 48–72 h washout is advised. • **Heterophile and interfering antibodies**: Human anti-mouse antibodies, rheumatoid factor, and anti-TSH antibodies can cross-link assay antibodies, yielding

midnight–4 am and lowest in late afternoon. Intra-individual variation may reach 50%. **Reference limits remain debated:** NHANES III suggests an upper limit ~4.5 mIU/L, while refined cohorts yield ~4.1. The NACB proposed 2.5 mIU/L, which would label 20% of healthy subjects abnormal. Importantly, TSH rises with age, with up to 12% of individuals >80y exceeding 4.5 mIU/L without hypothyroidism, likely reflecting altered hypothalamic-pituitary set-points rather than true hypothyroidism, highlighting the need for age-specific cut-offs to avoid overdiagnosis.	• **Non-thyroidal illness (NTI)**: Acute illness suppresses TSH, with rebound up to 20 mIU/L in recovery, mimicking autoimmune thyroiditis	falsely elevated TSH. • **Drug effects**: Dopamine, glucocorticoids, lithium, amiodarone, and antiepileptics alter TSH secretion or metabolism.
Free Thyroxine (FT4) & Triiodo-thyronine (FT3) Assay Methods 99% of circulating hormone is protein-bound. FT4 is measured by direct immunoassays, displacement analog methods, or gold-standard equilibrium dialysis/ ultrafiltration coupled with immunoassay or LC–MS/MS. FT3 assays are less standardized. Total hormone assays remain useful when binding protein abnormalities are suspected.	• **Hypothyroidism**: Low FT4 with elevated TSH = primary hypothyroidism. In central disease, FT4 is diagnostic since TSH may be normal or slightly elevated. • **Hyperthyroidism**: Elevated FT4/T3 with suppressed TSH. T3-toxicosis—isolated T3 elevation—is relatively common in children. • **Non-thyroidal illness**: Low T3 and often low/normal free T4 reflect impaired deiodination. • **Pregnancy**: Immunoassays underestimate FT4 due to TBG rise; TT4 adjusted ×1.5 is recommended. • Neonates have higher FT4 postnatally which gradually normalises. • Preterm infants often demonstrate **transient hypothyroxinemia** (low FT4, normal TSH), an adaptive immaturity that usually resolves spontaneously. • In pediatric Graves', FT3 is often disproportionately elevated.	Binding protein changes (pregnancy, nephrotic syndrome, liver disease) alter total hormone levels. Familial dysalbuminemic hyper-thyroxinemia (FDH) produces spuriously high FT4 on analog assays despite euthyroidism. Drugs such as phenytoin, carbamazepine, and amiodarone also distort results. Poor assay standardization complicates cross-laboratory comparison, necessitating local reference ranges.
Thyroid Autoantibodies Assays • **TPOAb, TgAb**: Measured by ELISA/chemiluminescence; highly sensitive for autoimmune thyroid disease. • **TRAb**: Binding assays detect all types; bioassays distinguish stimulating vs. blocking antibodies. Third-generation assays using recombinant human TSH receptor are most specific.	• **Hashimoto's thyroiditis**: TPOAb nearly universal; TgAb in 50–70%. • **Subclinical hypothyroidism**: Antibody positivity predicts progression to overt disease. • **Pregnancy**: TPOAb increases risk of miscarriage, preterm birth, and postpartum thyroiditis. **TRAb** • Specific for Graves' disease, distinguishing it from thyroiditis and factitious thyrotoxicosis. • Persistently elevated titres after antithyroid therapy predict relapse; falling titres predict remission. • In pregnancy, TRAb cross the placenta. Maternal titers > 2–3 ×	Poor harmonization across assays, epitope variability, and inability of binding assays to distinguish functional subtypes remain key challenges. **Pediatric Relevance** TPOAb predicts progression in children with mild TSH elevations. TRAb is vital in pediatric Graves' diagnosis and relapse risk. Neonatal thyroid dysfunction can occur via maternal TRAb transfer.

	ULN in the 2nd trimester predict neonatal thyrotoxicosis (1–5% risk). Guidelines recommend TRAb testing in women with active/ past Graves', repeated at 22–26 weeks if positive. Cord blood TSH/ FT4 should be checked if maternal titers are high.	
Thyroglobulin (Tg) Biology and Role Tg, secreted by thyroid follicular cells, is the matrix for thyroid hormone synthesis and an essential tumor marker for differentiated thyroid carcinoma (DTC). It is not diagnostic of benign disease but critical for follow-up post-thyroidectomy. **Assays** • **Immunometric assays (IMA)**: Widely used; sensitivity 0.1–0.2 ng/mL; standardized to CRM-457. • **Radioimmunoassays (RIA)**: Less sensitive, less common; less TgAb interference. • **LC–MS/MS**: Antibody-independent, ideal for TgAb-positive sera, but technically demanding.	• **Excellent response**: Suppressed Tg <0.2 ng/mL or stimulated Tg <1 ng/mL in absence of TgAb. • **Rising Tg** indicates residual or recurrent disease, even with negative imaging. • **Dynamic risk stratification**: Serial Tg trends refine prognosis. • **Factitious thyrotoxicosis**: Suppressed Tg suggests exogenous hormone ingestion.	• **TgAb**: Present in 20–30% of DTC patients, higher in children. TgAb cause falsely low Tg in IMAs and falsely high results in RIAs. Serial TgAb titres themselves can indicate disease course: declining = remission, rising = recurrence. • **Assay variability**: Different platforms are not interchangeable; monitoring must use the same assay. Children with DTC often present with more advanced disease but have excellent prognosis; thus, sensitive Tg monitoring is critical. TgAb prevalence is higher, making LC–MS/MS particularly valuable. In congenital hypothyroidism, absent Tg suggests agenesis, while detectable Tg supports ectopy or hypoplasia.
Calcitonin, secreted by C cells, is the most specific marker for medullary thyroid carcinoma (MTC). Carcinoembryonic antigen (CEA) is less specific but complements calcitonin in surveillance, particularly in poorly differentiated disease. **Assays** • **Immunochemiluminometric assays (ICMA)**: Functional sensitivity <2 pg/mL; minimal cross-reactivity with procalcitonin. • **Older RIAs**: Obsolete, less sensitive. • Vulnerable to **hook effect** in high antigen states.	• **Basal calcitonin**: >10 pg/mL abnormal; >150 pg/mL usually indicates metastatic disease; >1000 pg/mL implies distant spread. • **Provocative testing**: Calcium/ pentagastrin stimulation increases sensitivity but is rarely needed with modern assays. • **Postoperative surveillance**: o Undetectable at 3–6 months suggest biochemical cure. o Persistently detectable levels suggest recurrence. • **CEA**: Trends useful in follow-up; rising CEA with stable calcitonin suggests dedifferentiation. **Prognostic Doubling Times** • <6 months → poor prognosis, ~25% 5-year survival. • 24 months → excellent prognosis, >95% survival.	• **Hook effect**: falsely low results at high analyte levels; overcome with dilution. • **Heterophile antibodies**: may cause false elevation. • **Age variation**: Neonates/infants have higher baseline calcitonin. In children, calcitonin is central to **MEN2 management**, where RET mutations confer near-certain MTC risk. Basal calcitonin, combined with genotype, guides timing of prophylactic thyroidectomy. CEA monitoring is less validated in pediatrics but is used in follow-up.

Conclusion

Thyroid biochemistry has advanced from crude RIAs to ultrasensitive immunometric and mass spectrometry-based assays. TSH remains the frontline test, but interpretation requires awareness of physiologic variability, age-specific

ranges, and assay interference. Free T4 and T3, while indispensable, demand caution in settings of altered binding proteins and non-thyroidal illness. Thyroid autoantibodies refine risk prediction and diagnosis, while Tg and calcitonin serve as specific and sensitive tumor markers when interpreted with knowledge of their limitations. Careful assay selection, contextual interpretation, and awareness of pitfalls ensure accurate diagnosis and optimal follow-up across the spectrum of thyroid disease.

References

1. Esfandiari NH, Papaleontiou M. Biochemical testing in thyroid disorders. *Endocrinol Metab Clin North Am*. 2017;46(4):631-648.
2. Garber JR, Cobin RH, Gharib H, Hennessey JV, Klein I, Mechanick JI, Pessah-Pollack R, Singer PA, Woeber KA; American Association of Clinical Endocrinologists and American Thyroid Association Taskforce on Hypothyroidism in Adults. Clinical practice guidelines for hypothyroidism in adults. *Thyroid*. 2012;22(12):1200-1235.
3. Ross DS, Burch HB, Cooper DS, Greenlee MC, Laurberg P, Maia AL, Rivkees SA, Samuels M, Sosa JA, Stan MN, Walter MA. 2016 American Thyroid Association guidelines for diagnosis and management of hyperthyroidism and other causes of thyrotoxicosis. *Thyroid*. 2016;26(10):1343-1421.

PEDSENDOSCAN

Arpita Bhriguvanshi, *Professor Junior Grade, King George Medical University, Lucknow*

Gaur DS, Vij V, Virmani A, Jevalikar G, Malik M. Simplifying Strategies to Enable Universal, Decentralized Cord Blood TSH Screening: Lessons from a Tertiary Care Center in North India. Indian Pediatrics. 2025;62:276–282.
Single-center, tertiary-care service evaluation in North India over 24 months including all in-born deliveries (n=2,116) with universal cord-blood (CB) TSH (CB-TSH) and CB-FT4, with NB with TSH > 20 mIU/L recalled for confirmatory serum TSH/ FT4. Mean (SD) CB-TSH was 7.0 (5.3) mIU/L (3rd–97th centiles 2.6–18.8); CB-fT4 0.99 (0.2) ng/dL (0.7–1.4). 58/2,116 (2.7%) NB with TSH > 20 recalled: 52/53 were normal on retest, 1 true CH, 5 did not come back. Only 2 newborns (0.09%) had CB-TSH ≥40 mIU/L, of whom 1 had CH. The authors emphasize the need for universal cord blood TSH testing, underlining the feasibility of same-day reporting, but point out that recall rates of 2-3% are impractically high. To make a national program more practical, they propose simplifying it with a three-tier approach: TSH <20 mIU/L considered normal and discharged, if TSH 20-39.9, lab automatically tests FT4: if FT4 >1 ng/dl considered normal and discharged; TSH ≥40 confirmatory venous TSH & FT4 pre-discharge. **Using a TSH cut-off of 40 would reduce confirmatory testing to ~0.1%, and recall to even lower numbers, without loss of detection, desirable in a national screening program. Preterm babies would continue to need re-screening at age 2 weeks.**

Fitch R, Harper D, Conoscenti V, Huang R, Mould DR. Phase 1 Study Evaluating the Pharmacokinetics, Dose Proportionality, Bioavailability, and Tolerability of Subcutaneous Levothyroxine Sodium (XP-8121). Clin Transl Sci. 2025;18:e70244.
Two-part randomized program in healthy adults at a single clinical pharmacology unit: Part 1, randomized crossover (SC XP-8121 at escalating single doses vs 600 µg oral LT4 after a standardization dose) with intensive PK sampling; Part 2, open-label parallel single SC doses at higher ranges; primary endpoints were AUC0–∞ and Cmax with power-model assessment of dose proportionality and model-based projections to weekly dosing, and safety captured TEAEs/injection-site findings/ECG/labs. Baseline-adjusted exposure increased with dose and SC delivery showed dose-proportional PK with power-model slopes Cmax 1.17 (95% CI 1.02–1.33) and AUC0–inf 1.13 (95% CI 1.01–1.24); median Tmax ~4–6 h with sustained levels 4–5 days; relative bioavailability vs 600 µg oral LT4 was higher at SC doses, and population-PK projected **that once-weekly SC at ~4× the daily oral dose can match weekly oral exposure; safety was acceptable (mostly mild local reactions, no SAEs); pediatric dosing pending.**

Danner E, Niuro L, Lapinoja S, et al. Higher initial levothyroxine doses and very early treatment start may lead to better cognitive outcomes in children with congenital hypothyroidism. Acta Paediatr. 2025;114:594–602.
Two-center Finnish longitudinal cohort (cord-blood TSH screening pathway) comparing historical vs contemporary CH management: 180 CH identified; neuropsychology performed in 22 adults (historical dosing) and 20 children (contemporary dosing). Records provided initial LT4 dose, age at start, and early TSH/FT4; Wechsler age-appropriate tests generated FSIQ and index scores, with group comparisons to test norms and regression linking treatment variables to FSIQ. Adults had lower initial LT4 (8.1 µg/kg; 95% CI 7.2–9.0) and later start (4.8 days; 95% CI 4.0–5.6) than children (10.2 µg/kg; 9.7–10.7; p<0.001) and (3.6 days; 2.9–4.2; p=0.018); adult FSIQ 87.6±13.7 (p<0.001 vs norm) vs child FSIQ 97.9±15.1 (NS vs norm). **In adjusted analyses, higher initial dose associated with ~+3–4 IQ points (P≈0.03) and reduced odds of FSIQ ≤85 (OR≈0.40; 95% CI ~0.17–0.94); in children, later start predicted lower FSIQ (β≈−0.55; p≈0.01). Authors conclude that early initiation (day 3–4) with 12–15 µg/kg/day and tight early titration likely improves cognitive outcomes.**

Li Y, Wang X-M, Shi W-Y, Chen J-J, Song Y-N, Gong C-X. Effect of antithyroid drugs treatment duration on the remission rates of Graves' disease in children and adolescents: a single-arm meta-analysis and systematic review. Clin Endocrinol (Oxf). 2025;102:196–204.

PRISMA-guided systematic review/single-arm meta-analysis pooling 19 pediatric Graves' cohorts (n=3,359; 2–18 y); unified remission definition (euthyroid ≥12 months off ATDs), random-effects models estimated overall and duration-stratified remission; subgroup/ meta-regression examined moderators (age, treatment duration, follow-up), and Egger's test assessed publication bias. Pooled remission was 25.4% (95% CI 20.7–30.1); by duration <2 y 15.5% (6.7–26.5), 2–5 y 24.1% (18.9–29.8), >5 y 33.0% (21.9–45.1); meta-regression estimated +3.8% absolute increase per ATD year (95% CI 0.6–7.0; p<0.01), with older age at diagnosis also favoring remission; publication bias not significant (Egger's t=0.80, p=0.432). These data **support counseling families that remission on methimazole improves with multi-year therapy** while balancing risks and considering earlier definitive therapy in selected cases.

German A, Almashanu S, de Vries L, et al. Insights into Central Congenital Hypothyroidism: A Multicenter Retrospective Analysis. J Clin Endocrinol Metab. 2025;110:e1653–e1659.

Nationwide multicenter retrospective series from Israel (1987–2021) assembling 94 infants with central congenital hypothyroidism (CCH) from endocrine centers; data captured screening pathway, initial biochemistry, pituitary involvement (MPHD vs. isolated), age at diagnosis and neurodevelopmental outcomes. Cohort prevalence was ≈1:42,800 live births; 84% had MPHD and 16% isolated CCH; median age at diagnosis ~50 days (range 1–8,760). Notably, TSH-only newborn screening detected just 3 infants, with most diagnosed later for feeding issues, hypoglycemia, cholestasis or developmental concerns. Neurologic sequelae were frequent (~37% overall) and more common in isolated CCH vs MPHD (~60% vs 32%; p=0.04). **Programs employing TT4 primary with TSH reflex captured CCH that TSH-only strategies would miss, supporting, in TSH-only settings, targeted FT4+TSH in NICU/high-risk neonates and early LT4 once confirmed.**

LISTENING TO THE STALWARTS

Nikhil Lohiya, *Department of Growth & Endocrinology, Silver Lining Pediatric Super Specialty Center, Nagpur*

Dr Raghupahty Palani needs no introduction, especially to pediatricians and pediatric endocrinologists. He is a pioneer in the field and has contributed immensely to ISPAE. Many of our fraternity have learnt pediatric endocrinology under his mentorship. Team CAPE NEWS was fortunate enough to have his interview for this issue on thyroid disorders.

1. *Hello sir, thank you for accepting to be interviewed. Your name has been right on top among the first-generation pediatric endocrinologists in our country. Can you please tell us during those times when things were tough as a society and nation, what made you to pursue pediatric endocrinology?*

Soon after my internship, I joined Christian Medical College (CMC), Vellore, with the aim of training as a pediatrician. After intense training for DCH and MD Pediatrics, I worked as a staff there for 7 years, gaining valuable experience in all areas of pediatrics. At CMCH, in those early years, we used to have several adult specialty departments and with their help, we were able to provide appropriate treatment and obtain good results even for complicated illnesses and rare disorders, referred to us from all over the country. However, I was always displeased that we were not optimally managing pediatric endocrine cases. This was compounded in those times by the lack of hormonal investigations and suitable medications; and there was no adult endocrinology unit to guide us in CMCH at that time. This intensified my desire to train as a pediatric endocrinologist, but there were very few centers in the country offering DM courses in Endocrinology in those days, and also, they were predominantly dealing with adult patients. While exploring for a suitable center, I was fortunate in getting an opportunity to train and successfully at the Royal Alexandra Hospital for Children in Sydney, Australia, under Prof. Martin Silink for 3 years (1983-1986). Although the Department was in tune with the time, Prof. Silink being an astute clinician, helped me beyond expectations. Despite a job offer to continue in Sydney, I preferred to return to CMC, to cater to needy children in our own country. I am happy I was able to commence one of the earliest full-fledged pediatric endocrinology centers at CMC.

2. *How do you think the training in pediatric endocrinology has evolved in our nation in the past few decades? What positive changes do you see in it?*

Even after my return to Vellore, it was no easy ride to establish a comprehensive unit. It involved a lot of struggle and administrative constraints. However, because of support from CMC, I was able to improvise available facilities and offer it to my patients, e.g. importing monocomponent insulin through Church World Service etc. Though I was able to instil the seeds of pediatric endocrinology in many of my young postgraduates, my dream of conducting a Clinical Fellowship in Pediatric and Adolescent Endocrinology materialized only after I joined the Indira Gandhi Institute of Child Health, Bangalore, following my retirement from CMC Vellore, in 2004. I am pleased that I have trained several scores of pediatricians as Pediatric Endocrinologists during my stint at the Institute. I am equally proud that there are currently multiple centers in our country offering this training and there is quite a lot of growing interest and enthusiasm among young pediatricians to acquire training in pediatric endocrinology.

3. *You have taught and mentored many of us in pediatric endocrinology. How much did you enjoy it? How much you cherish this aspect of your contribution as a pediatric endocrinologist?*

It is indeed a great joy to see the vast number of children now availing pediatric endocrine services over a wide geographic area in our country, after the training programs commenced here, and also elsewhere in multiple other centers.

The most enjoyable aspect of pediatric endocrinology is to observe the magnificent clinical transformation of our patients following regular replacement therapy with deficient hormones, which are quite often life-saving. To observe the affected listless child bloom and blossom during follow-up, closely similar to their peers, fills our hearts with immense satisfaction and contentment. It is truly a dream come true, at least partly. I say partly because there are still many areas which require our continued efforts in the way of uniform nationwide programs, such as establishment of newborn screening for congenital hypothyroidism (CH) and congenital adrenal hyperplasia; universal availability of insulins, GnRH analogs, growth hormone therapy, etc. I have mentioned here projects with the highest benefit: cost ratio as the initial steps. These will need to be followed subsequently by coverage of other aspects of paediatric endocrinology.

4. *You have done a significant amount of work in thyroid disorders in children. What made you embark on this path?*

Among all endocrine conditions in children, thyroid disorders are the commonest ones encountered. Whether congenital or acquired, the need for prompt recognition without any delay, early onset of thyroxin replacement and regularity of treatment cannot be overemphasized. The need for newborn screening for CH was clearly documented as early as 1974 (with T4, and 1987 with TSH) in Canada; it was gradually but extensively introduced in developed countries. It is indeed a pity that this is still not the routine in India. The plight of children presenting late in infancy with irreparable full-blown CH was and is always heartrending.

Despite all efforts, I took nearly 15 years to introduce this in my own institution (in the year 2001). The incidence of CH (1 in 1,212 births) in Vellore was noted at that time to be nearly 3-4 times as common as in the West (1 in 1,300 – 1,400 births). I am pleased that in CMC, this is an ongoing program even now, without interruption for the last quarter century. The benefits are enormous. Replacement therapy with thyroxin is quite simple, practical and does not cost even a rupee per day. The driving forces for me are the remarkable results of early diagnosis and treatment with thyroxin restoring normal growth and development as compared to a child with severe developmental delay who missed the diagnosis and treatment.

5. *Why is universal coverage of newborn thyroid screening still a challenge in our country? What can be done to overcome this challenge?*

It has been proved beyond doubt more than half a century ago that newborn thyroid screening should be mandatory in all parts of the world. Even in the developed countries, this awareness was slow, but it was eventually achieved. There should be no further delay in implementing this as a national program in India. As professional bodies, ISPAE and IAP have submitted their representations in this regard to the central health authority. For the present, this issue can be solved ONLY by a change in federal health policy. For our part, we need to pursue with our efforts in a relentless manner.

6. *Can ISPAE take this challenge of universal newborn screening program and make any improvements on this front?*

The challenge of establishing neonatal thyroid screening in India should certainly be taken up by ISPAE and IAP on a war footing. These two powerful professional bodies should spread awareness among the vast number of pediatricians and obstetricians that they are directly responsible for the total well-being of all infants and children

seeking their care, thus emphasizing the importance of newborn thyroid screening. Some simplifying strategies to enable universal, decentralized cord blood TSH screening are currently being tried in the private setup but as you would understand, this will cater to only the privileged section of the population, will not cover rural and remote areas, and will be far short of ideal.

As the President of a local Pediatric Society, when I was able to arrange for neonatal cord blood TSH assay at a cost of Rs 50/- (with the magnanimous help from a private hospital), I am sorry to say here that I could not manage to get a single blood sample.

The larger initiative should evolve from the pediatricians and obstetricians who are the first contact for the families expecting a child. During my stint in Vellore, I used to sensitize women attending the antenatal clinics regarding newborn screening. These women and their families should be made aware about the essential need for newborn thyroid screening and should be motivated to demand for cord blood TSH when their baby is born. I think that collective responsibility is the right way to go about in solving this problem.

7. *How do you deal with a child with delayed diagnosis of CH and consequent intellectual deficit, who has grown almost an adult? How did you make peace with the situation? I am asking this because it is disturbing for all of us to have such scenario in front of us.*

This is a heart-wrenching situation and I do not want to discuss about it. My grief in encountering this scenario *in this day and age* is unbearable and I can only shed silent tears. The unfortunate parents suffer life long, for no fault of theirs. It is indeed the moral responsibility of all health care providers, both in the government and private setup. Everyone is aware that CH is the most common preventable cause of mental retardation in children and once developmental delay has set in, it is irreparable by any means of treatment. God alone can help!

8. *In terms of long-term management of acquired hypothyroidism, what should a pediatric endocrinologist keep in mind?*

Even in cases of acquired hypothyroidism, early recognition and diagnosis, and prompt initiation of thyroxin therapy play an important role in minimising adverse effects of hypothyroidism and maximising the benefits accrued from optimal treatment with the right dose, compliance and regular follow-up. Diagnostic criteria should be strictly followed, and hasty conclusions should be avoided before suggesting long term treatment. Once a firm diagnosis is made, parental education is also essential in every case in order help the families to stay away from alternative modes of treatment, dispel their fears of side effects of therapy, and to convince them about compliance of treatment. Regular follow-up will ensure significant improvement in their child's growth and development.

9. *You are a social worker, teacher, scientist, an astute clinician, and also contributed as a policy maker in diabetes and thyroid disorders in children. Which role did you enjoy the most, and which did you feel was the most significant in terms of impacting life of children in India?*

Most of the pediatric endocrine disorders require lifelong monitoring and therapy. This can be achieved only by organising parental counselling and education sessions and providing them with instructional material on the subject in simple language. Once they understand the basic mechanism of the disorder and the role of the treatment suggested, their compliance improves, and the child is the ultimate beneficiary. Such long-term association with the children and their families, watching the children flourishing with their laurels and accomplishments, is the most enjoyable aspect of practising pediatric endocrinology. Knowing the family well helps us often in guiding them appropriately.

10. Being a founder member of ISPAE, how do you see the journey this vibrant Society has seen?

ISPAE has made vast strides and gathered a good number of trained members who are actively involved in furthering the growth of our Society, constantly drawing more into our fold. Unlike in the eighties and nineties, more facilities are available in India now, with the advent of liberalisation, viz., lab and research investigations, therapeutic agents, etc. Nowadays, the availability of regularly updated Clinical and Therapeutic Guidelines for the management of various pediatric endocrine disorders help us to keep ourselves up to date. Regular conferences, CME Programs also help us in building interactive co-operation among Society members and to disseminate awareness and knowledge of the subjects among pediatricians.

11. Any message for budding pediatric endocrinologists?

The future of Pediatric Endocrinology in India appears bright!

CASE REPORT- "WHEN INFECTION SPILLS HORMONES: TRANSIENT THYROTOXICOSIS IN THYROID ABSCESS"

MS Srivaishnavi, Vani HN, *IGICH, Bengaluru*

A 4-year-old girl presented with high-grade intermittent fever, throat pain, cough, and a painful anterior neck swelling for 15 days, with no symptoms of hyperthyroidism. On examination, there was a 6 × 6 cm tender, warm swelling in the anterior neck that moved with deglutition. The swelling did not move with protrusion of the tongue, ruling out a thyroglossal cyst. She was also noted to have bilateral congenital ptosis. Laboratory evaluation showed leukocytosis (TC 24,800/µL), elevated CRP (314.8 mg/L), and elevated FT4 (4.14 ng/dl) and TT4 (20.98 µg/dl) with suppressed TSH (0.020 µIU/ml). Ultrasonography revealed a hypoechoic lesion in the left thyroid lobe with strap muscle inflammation, suggestive of thyroid abscess (3-5cc). She was started on IV ceftriaxone, which was later upgraded to piperacillin-tazobactam, as fever persisted. By day 5, fever subsided and the swelling regressed. She completed a 10-day course of antibiotics, after which repeat imaging showed a small residual collection (1–2 cc). Subsequent TFT normalized (FT4 1.40 ng/dl, TT4 7.12 µg/dl, TSH 0.027 µIU/ml). She was discharged in a stable condition.

Fig 1: Neck swelling at presentation.

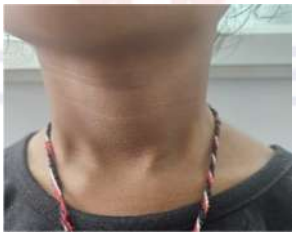


Fig 2: After antibiotic course - swelling regressed.

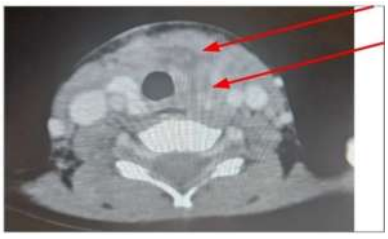


Fig 3: Contrast-enhanced CT neck showing abscess in the left thyroid lobe with surrounding strap muscle inflammation.

After 3 months, she presented again with intermittent pain in the neck region, swelling, but no history of fever. On thyroid examination a firm, non-tender 2 × 2 cm swelling in the left lower anterior neck was observed. Investigations showed normal hematological/ biochemical parameters and euthyroid status. Ultrasonography demonstrated a minimal collection (9 × 3 mm) superior to the left lobe, without sinus tract. MRI neck showed a well-defined collection (0.8 × 1.5 × 1.3 cm; ~1–1.5 cc) anterior to the left thyroid lobe, deep to strap muscles, with peripheral enhancement, septations, and surrounding edema; no sinus tract was visualized.

Given the persistent collection and suspected 3rd/4th branchial pouch anomaly, she underwent left hemithyroidectomy. Intra-operatively, the left thyroid gland was densely adherent to strap muscles, trachea, and cricothyroid membrane. Superior, middle, and inferior thyroid vessels were ligated, and adherent strap muscle was excised with the lobe. No deep traversing track noted. Postoperative video laryngoscopy confirmed normal vocal cord movements.

Date	Initial presentation	Post antibiotic course	After 3 months	Reference range
FT4	FT4 **4.14 ng/dl - ↑**	FT4 1.40 ng/dl →	FT4 1.35 ng/dl →	0.8 - 2 ng/dl
TT4	TT4 **20.98 µg/dl - ↑**	TT4 7.12 µg/dl →	TT4 9.35 µg/dl →	5.1-14.1 µg/dl
TSH	TSH **0.020 µIU/ml- ↓**	TSH 0.027 µIU/ml ↓	TSH 3.14 µIU/ml →	0.27-4.2 µIU/ml

Discussion

Thyroid abscess is an uncommon condition in children, owing to the gland's protective anatomy, including its fibrous capsule, rich vascular supply, and lymphatic drainage. When present, it strongly suggests an underlying congenital anomaly, particularly a third or fourth branchial pouch remnant, which predisposes patients to recurrent suppurative thyroiditis or abscess formation[1].

Although fever, neck swelling, and tenderness are classical features, our patient exhibited transient biochemical thyrotoxicosis at presentation. This phenomenon results from follicular disruption during acute suppuration, leading to leakage of preformed thyroid hormones into circulation. Similar pediatric and adult cases have been reported with varying presentation severity—from subtle hormonal elevation to overt thyrotoxicosis[2-4]. Notably, Gaur et al. (2024) described an adolescent girl who presented with a thyroid abscess and transient hyperthyroidism and responded well to antibiotic therapy without requiring drainage[5]. Thyrotoxicosis in this context may mimic other conditions like Graves' disease or subacute thyroiditis unless infection is considered.

Initial management involves prompt broad-spectrum antibiotics, with or without drainage. However, in cases linked to branchial pouch anomalies, recurrence is common and definitive surgical excision is often warranted[1]. In our patient, while conservative management initially provided resolution, recurrence with a persistent collection necessitated left hemithyroidectomy. Dense adhesions without an identifiable tract are consistent with prior observations, likely due to repeated infections obscuring the anomalous pathway[1].

This case highlights two pivotal clinical insights: (1) pediatric thyroid abscess should prompt evaluation for underlying branchial anomalies, and (2) transient thyrotoxicosis often occurs via hormone spillover from follicular disruption. Awareness of this can prevent misdiagnosis and guide appropriate surgical intervention to avoid recurrence and long-term morbidity.

Acknowledgment**:** The authors gratefully acknowledge the pediatric surgical team, Dr Deepak J and Dr Vinupriya, for their operative management and support in the care of this patient.

References

1. Kruijff S, Sywak MS, Sidhu SB, Shun A, Novakovic D, Lee JC, et al. Thyroidal abscesses in third and fourth branchial anomalies: not only a paediatric diagnosis. *ANZ J Surg*. 2015;85(7-8):578–81. doi:10.1111/ans.12576. PMID:24674380
2. Esfahani M, Ghaffari P, Eslami M, Yazdi Z. Thyrotoxicosis as a rare presentation in acute suppurative thyroiditis: a case report. *J Med Case Rep*. 2023;17:428. doi:10.1186/s13256-023-04119-1. PMID:37833794.
3. Matheny LN, Bao S. Thyrotoxicosis due to acute suppurative thyroiditis in a postpartum woman. *J Clin Endocrinol Metab*. 2020;105(12):dgaa627. doi:10.1210/clinem/dgaa627.
4. McHan L, Gupta J. Thyrotoxicosis due to acute suppurative thyroiditis in a pediatric patient: a case report. *J Investig Med High Impact Case Rep*. 2022;10:23247096221127841. doi:10.1177/23247096221127841. PMID:36245235.
5. Gaur BK, Jain S, Tandon A, Jain N. Thyroid abscess associated with transient hyperthyroidism in an adolescent girl: a rare case report and review of the literature. *J Pediatr Endocrinol Metab*. 2024;37(9):825–8. doi:10.1515/jpem-2024-0205.

JUNE 2025
Volume 29 - Issue 2

CAPE News | ISPAE

LEARNING PEARLS : 31ST ISPAE ACES MEETING: 21.6.25: HYPOGONADOTROPIC HYPOGONADISM IN BOYS

Zalak Upadhyay, *Pediatric and Adolescent Endocrinologist, Endocare for kids, Rajkot*

Learning pearls:

* Utilize the mini-puberty period actively—it's a diagnostic and interventional opportunity.
* Inhibin B and AMH are useful biomarkers in infancy and adolescence; use them alongside LH, FSH, and testosterone for clearer differentiation.
* Gonadotropin therapy should be the preferred induction method in CHH to promote true gonadal development and optimize final height and future fertility.

The 31st ISPAE ACES meeting, conducted on 21st June 2025, 7-9 pm, on "Hypogonadotropic hypogonadism in boys", was a successful event. We would like to thank the case presenters, moderators and speakers for their contribution.

The next meeting on **27th September 2025, 7-9pm,** is on **46 XY DSD.**

Early/Neonatal Management

Micropenis:

- IM testosterone enanthate 25 mg q3–4 weeks × 3 months OR topical 5% testosterone/ DHT cream.
- **Cryptorchidism:** surgical correction ± hCG/GnRH adjuncts (benefit limited).
- Outcomes: may improve testicular size/ function, but unclear effect on fertility response.
- Caution: hCG in cryptorchid infants may impair germ cells (↓testis volume, ↑FSH later).

Differentiating IHH from CDGP

	CDGP	IHH
8 am Testosterone	>20 ng/dl (predicts testes >4 ml by 12–15 months)	Persistently low
Basal LH	>0.6 IU/L	<0.3 IU/L
Basal Inhibin B	>35 pg/ml	<35 pg/ml (boys)
AMH	Normal/high	<20 ng/ml
Bone Age	Delayed	Normal
GnRH agonist stimulation test	Stimulated LH >5.3 IU/L & Inhibin B >111 pg/ml	

Pubertal Induction with Gonadotropins

If TV <6 ml:

- Start rFSH 75 IU s.c. thrice weekly × 2 months → escalate if FSH low.
- Add hCG 500 IU/week → increase stepwise up to 1500 IU twice weekly.

- Monitor: SMR, testicular USG, testosterone, inhibin B, bone age.
- Semen analysis once TV >10–12 ml (within ~3 years).

If TV >6 ml:

- Start hCG 500–1000 IU 1–2×/week.
- Add rFSH if no sperm/testicular growth or inhibin B decline.
- Target testosterone ~10 nmol/L after 6 months; ~20 after 1–2 years.

Fertility Induction (Adults/ late adolescents)

- Start hCG 500 IU twice weekly → escalate to 1500 IU.
- Once testosterone 8–10 nmol/L (≈4 months), add rFSH 150–300 IU 3×/week.
- Continue until adequate sperm production.
- Maintenance: long-acting testosterone until fertility desired.
- Fertility induction: stop T, continue hCG 1500 IU twice weekly + add rFSH.
- Semen analysis when TV >16 ml, inhibin B >60 pg/ml.

LEARNING PEARLS: PEPP • Delayed Puberty

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

- Delayed puberty is more common in boys than girls.
- The most common cause of delayed puberty is constitutional delay.
- Gender appropriate age cutoffs should be used to diagnose delayed puberty.
- Thorough examination including SMR (Sexual Maturity Rating) should be done first.
- Screening investigations to look for systemic causes should be done as a part of initial evaluation.
- Bone age is a very helpful in differentiating various etiologies of delayed puberty.
- Thyroid axis work up is an essential in the evaluation.
- FSH is the most important marker in the evaluation.
- Karyotype should be done in every short girl with delayed puberty after hypothyroidism is ruled out.
- Sex hormone replacement at timely age is very important and commonly administered therapy.
- Gonadotropin supplementation is necessary to have fertility while managing hypogonadotropic hypogonadism.

LEARNING PEARLS: PEP Precocious Puberty

ISPAE-PEP Meeting on Precocious Puberty – 27th August 2025

Jaivinder Yadav, *PGIMER Chandigarh, &* ***Vijay Jaiswal,*** *LLRM Medical College Meerut*

The ISPAE-PEP session on precocious puberty, held on 27th August 2025, featured insightful case discussions contributed by teams from Himachal Pradesh and Punjab. The first case, on central precocious puberty (CPP), was presented by Dr Atul Gupta (Asst Prof, Rajendra Prasad Govt Medical College, Kangra) and examined by Prof M Vijayakumar (Head, Dept of Pediatrics, GMC, Calicut, Kerala). The second case, focusing on peripheral precocious puberty (PPP), was presented by Dr Anetta K Alex (Third-year MD Resident, Christian Medical College, Ludhiana) under the guidance of Dr Aayush Gupta (Asst Prof, CMC, Ludhiana) and examined by Prof. Preeti Singh (Lady Hardinge Medical College, Delhi). An OSCE session on the topic was also conducted by Dr Aayush Gupta.

Key Learning Points

Approach to Diagnosis of Precocious Puberty

1. The normal pubertal sequence is thelarche → pubarche → menarche in girls, and gonadarche → pubarche → spermarche in boys. This sequence is maintained in central precocity, but not in precocious precocity.
2. Isolated premature thelarche is a benign variant seen at 1–3 years of age, characterized by breast development without growth acceleration or bone age advancement; careful follow-up is usually sufficient.
3. Isolated premature pubarche may also occur; bone age and serum DHEAS should be assessed. Premature pubarche may indicate an increased future risk of metabolic syndrome.
4. Clinical markers of CPP include growth spurt, advanced bone age, and pubertal changes on ultrasound: uterine length >3.5 cm, endometrial thickness >4 mm, ovarian volume >2 mL.
5. In girls, CPP warrants evaluation if onset before 2 years or neurological symptoms (e.g., headache, visual changes, raised ICP). All boys with CPP warrant evaluation for CNS pathology.
6. Clinical clues to PPP include heterosexual development, growth arrest (hypothyroidism, adrenal tumors), café-au-lait spots with fibrous dysplasia (McCune-Albright syndrome), and unilateral gonadal enlargement (testicular/ ovarian tumors).

Management Pearls

1. Isolated premature thelarche and pubarche generally require periodic observation, no active treatment, unless early or rapidly progressing puberty threatens adult height potential or causes psychosocial distress.
2. GnRH analogs are standard therapy for CPP till age 10-11y in girls/ 11-12y in boys. They suppress the HPG axis, slow pubertal progression and bone age advancement. Monitor with clinical progression, growth velocity, bone age, and suppression of stimulated LH (<4 mIU/mL at 4 hours).
3. Supportive care—including counseling of children and families, psychosocial support, and reinforcement of self-esteem—is essential.
4. Management of PPP depends on the underlying cause: surgical resection of tumors, use of aromatase inhibitors, ketoconazole, antiandrogens, or steroid replacement as appropriate.
5. Long-term follow-up is required to monitor final adult height, fertility outcomes, recurrence risk, and psychosocial adjustment.

BEST PROGRAM

BEST Batch 10 – Continuing the Journey of Empowerment

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

The Basic Education Series in Type 1 Diabetes (BEST) continues to create a meaningful impact by spreading knowledge, building confidence, and fostering a supportive community for children, adolescents, and families living with type 1 diabetes. With each successive batch, the program reaffirms its commitment to improving lives by empowering not just families, but also health professionals who play a crucial role in diabetes care.

Batch 10 brought together 44 enthusiastic participants from diverse parts of the country: parents, children, young persons with diabetes, physicians, fellows and educators. This diversity enriched the learning environment, allowing participants to benefit from shared experiences and collective wisdom. Over the course of four interactive weeks, the sessions remained highly engaging, covering essential aspects of diabetes self-management, nutrition, insulin use, technology, sick day/hypoglycemia management, exercise, physical activity, travel and school. The emphasis was not only on medical facts but also on practical solutions to everyday challenges, helping participants translate knowledge into meaningful action. A highlight of this batch was the active participation and dialogue, with families asking insightful questions, sharing lived experiences, and finding encouragement from peers. The involvement of physicians added depth to the discussions, bridging professional expertise with real-life

perspectives. We remain deeply indebted to our seniors, faculty, and colleagues whose passion, commitment, and generosity of time continue to shape the success of BEST. Their guidance ensures that every batch carries forward the motto to improve the quality of life and future health of children and adolescents with type 1 diabetes. BEST Batch 10 stands as yet another milestone in this ongoing journey of education, empowerment, and hope.

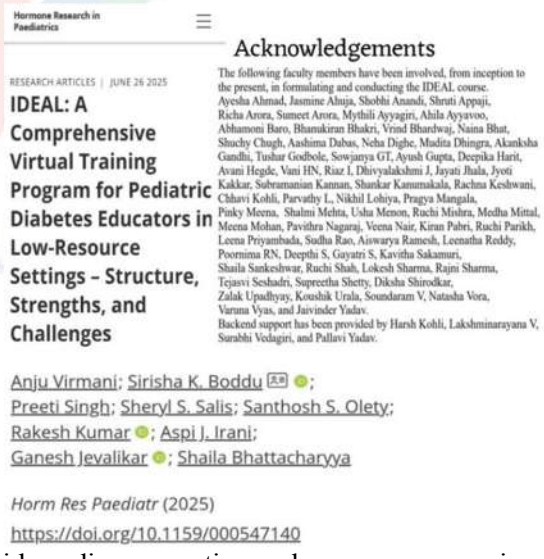
IDEAL PROGRAM

IDEAL: Empowering Pediatric Diabetes Educators Across India and Beyond


Sirisha Boddu, *Consultant Pediatric Endocrinologist, Rainbow Children's Hospital, Hyderabad &* ***Anju Virmani,*** *Director, Pediatric Endocrinology, Max Smart Super Speciality Hospital & Rainbow Children's Hospital, Delhi*

The Indian Society for Pediatric and Adolescent Endocrinology (ISPAE)'s flagship initiative, the *ISPAE Diabetes Education And Learning (IDEAL)* program, has reached another important milestone. Since its inception in October 2021, IDEAL has successfully completed the training of nine batches of pediatric diabetes educators (every third batch is tailored for physicians), with the 10th batch now underway. Structured as a 12-week comprehensive virtual course, IDEAL consists of 24 interactive sessions, practical assignments, and a rigorous exit examination. The program is powered by 58 volunteer faculty from across India, bringing together expertise, mentorship, and practical insights. Learning continues well beyond certification through the *IDEALites* WhatsApp forum, which has become a vibrant platform for ongoing dialogue, peer support, and collaboration. To date, 177 educators (128 non-physicians and 49 physicians) have graduated from IDEAL. Almost half of the participants hailed from smaller cities, 91% were women**,** and 24% were persons/ parents with T1D**,** reflecting the program's diversity and inclusiveness. An alumni survey involving 85 respondents found that 88% are actively contributing to pediatric diabetes care, with many receiving recognition and awards for their efforts.

The program has garnered national and international recognition and interest, including the ISPAD Innovation Award in 2023, and formal endorsement by ISPAD**.** Our experience has been published in Hormone Research in Paediatrics (Karger, 2025), establishing IDEAL as a pioneering and replicable model for capacity-building in low-resource settings.


Hormone Research in Paediatrics

RESEARCH ARTICLES | JUNE 26 2025

IDEAL: A Comprehensive Virtual Training Program for Pediatric Diabetes Educators in Low-Resource Settings – Structure, Strengths, and Challenges

Acknowledgements

The following faculty members have been involved, from inception to the present, in formulating and conducting the IDEAL course. Ayesha Ahmad, Jasmine Ahuja, Shobhi Anandi, Shruti Appaji, Richa Arora, Sumeet Arora, Mythili Ayyagiri, Ahila Ayyavoo, Abhamoni Baro, Bhanukiran Bhakri, Vrind Bhardwaj, Naina Bhat, Shuchy Chugh, Aashima Dabas, Neha Dighe, Mudita Dhingra, Akanksha Gandhi, Tushar Godbole, Sowjanya GT, Ayush Gupta, Deepika Harit, Avani Hegde, Vani HN, Riaz I, Dhivyalakshmi J, Jayati Jhala, Jyoti Kakkar, Subramanian Kannan, Shankar Kanumakala, Rachna Keshwani, Chhavi Kohli, Parvathy L, Nikhil Lohiya, Pragya Mangala, Pinky Meena, Shalmi Mehta, Usha Menon, Ruchi Mishra, Medha Mittal, Meena Mohan, Pavithra Nagaraj, Veena Nair, Kiran Pabri, Ruchi Parikh, Leena Priyambada, Sudha Rao, Aiswarya Ramesh, Leenatha Reddy, Poornima RN, Deepthi S, Gayatri S, Kavitha Sakamuri, Shaila Sankeshwar, Ruchi Shah, Lokesh Sharma, Rajni Sharma, Tejasvi Seshadri, Supreetha Shetty, Diksha Shirodkar, Zalak Upadhyay, Koushik Urala, Soundaram V, Natasha Vora, Varuna Vyas, and Jaivinder Yadav.
Backend support has been provided by Harsh Kohli, Lakshminarayana V, Surabhi Vedagiri, and Pallavi Yadav.

Anju Virmani; Sirisha K. Boddu; Preeti Singh; Sheryl S. Salis; Santhosh S. Olety; Rakesh Kumar; Aspi J. Irani; Ganesh Jevalikar; Shaila Bhattacharyya

Horm Res Paediatr (2025)
https://doi.org/10.1159/000547140

Since October 2022, the IDEAL faculty has been working towards increasing awareness of school staff for diabetes self-care – the **Initiative for Diabetes Education and Awareness in Schools (IDEAS)**. After conducting a series of online sessions, videos have been prepared for parents to share with their child's school staff at diagnosis and the start of every academic year. These videos discuss routine and emergency care in school, and are available on the ISPAE website and the IDEAS YouTube channel in 8 languages including English, Hindi, Gujarati, Kannada, Tamil, and Telegu.

In July 2024, IDEAL broadened its reach with the launch of **Monthly Myth-busting Messages (MMM)**, aimed at addressing widespread misconceptions around type 1 diabetes (please see IDEAL Corner as well):

- July MMM: cautioned against the harms of very low-carbohydrate diets in children.

- August MMM: highlighted the drawbacks of premixed insulin regimens, reinforcing the importance of basal-bolus therapy.
- September MMM: tackled the dangerous myth that occasional checking blood glucose is sufficient, emphasizing that multiple daily checks are essential for good glycemic control and quality of life.

In September 2025, IDEAL launched its **social media presence** to share educational updates and resources on T1D, by initiating its presence on Facebook, Instagram, and X. Links are in the IDEAL Corner. Do subscribe and follow for more information on T1D.

Through its structured educator training and advocacy initiatives like IDEAS and MMM, IDEAL continues to transform pediatric and adolescent diabetes care in India, building both expertise and community to support children and families living with T1D.

AWARDS/ PUBLICATIONS BY ISPAE MEMBERS

Dhanya Soodhana Mohan, Consultant Pediatric & Adolescent Endocrinologist at Aster MIMS, Kozhikode, was awarded the European Society of Pediatric Endocrinology- Clinical Fellowship in 2025. She was hosted by Evelina Children's Hospital under the mentorship of Dr Fiona Regan, London for a period of 3 months. The center specializes in metabolic bone disorders, neuroendocrine tumors, achondroplasia and other skeletal dysplasias, apart from management of children with T1DM, growth and pubertal disorders.

ACTIVITIES BY ISPAE MEMBERS

Sweet Kids Family Get-Together

Dhanya Soodhana Mohan, *Consultant Pediatric & Adolescent Endocrinologist, Aster MIMS, Kozhikode*

A two-day camp for children living with Type 1 Diabetes Mellitus (T1DM) was organized by the T1D Welfare Society, Kozhikode, at Navjyothis Renewal Centre on 2-3 Sept. The event brought together 30 families of children aged 5–18 years, creating a vibrant atmosphere of learning, sharing, and support. The camp was coordinated by Mr Prashanth Mani (Secretary, Type 1 India Foundation), Mr Vijesh TR (State President, T1D Welfare Society) and Mrs Shana, whose efforts made the program a memorable success.

Educational sessions were an integral part of the program. Dr Dhanya conducted a hands-on workshop on carbohydrate counting, where children were encouraged to calculate their own insulin doses during mealtimes. Nutritious, balanced meals prepared at the center provided practical opportunities for applying this knowledge. Mrs Pravitha Bijith, a parent-child counsellor, engaged families in discussions addressing common concerns faced during adolescence. These sessions gave parents valuable tools to better support their children. Dr Achyutha Krishnan, a T1D cycling enthusiast had cycled from Pondicherry to Kozhikode and truly inspired the kids.

Beyond education, the camp was filled with fun and creativity. Children showcased their talents through sketching, cultural performances, and a lively DJ night. Senior T1Ds played a vital role in advocacy, inspiring the younger children with their experiences and reinforcing the message that diabetes management is possible with the right mindset and support. For parents of children newly diagnosed with T1DM, the camp was especially reassuring. Witnessing so many families leading healthy, fulfilling lives with proper education and care helped them breathe a sigh of relief.

Adolescent Endocrinology Unplugged

Veena Nair & Dhanya Soodhana, *Thiruvananthapuram, Kerala*

The adolescent years are a period of vulnerability & opportunity. A module on adolescent endocrinology was organised as a part of IAP Kerala Presidential Action Plan at Govt Medical College, Thiruvananthapuram on 21st Sept, 2025. The module was prepared by pediatric endocrinologists in Kerala under the guidance and patronage of Drs PSN Menon, Vijayalakshmi Bhatia, Vijayakumar M and Riaz I (President, IAP, Kerala). This exclusive one-day CME focused on the practical approach to common endocrine challenges in adolescents, with expert insights, real-world case discussions, and evidence-based updates. The program was attended by around 75 pediatricians and was well appreciated.

IDEAL CORNER

Shruti Arora, *Certified Pediatric Diabetes Educator & IDEALite, Gurgaon*

1 July 2025 – □ The IDEAL MMM Program – Monthly Myth-busting Message

On the occasion of Doctors' Day, IDEAL announced the launch of the *Monthly Myth-busting Message (MMM)* program to counter myths and misinformation surrounding Type 1 Diabetes (T1D). Starting July, IDEAL will share one short, evidence-based message each month addressing a common myth about T1D. Healthcare

professionals and supporters are encouraged to share the monthly message on their social media profiles and circulate it across WhatsApp, Telegram, and other groups to spread awareness. The initiative aims to create a more informed and supportive ecosystem for children and families living with T1D.

July 2025 – Beyond the Diagnosis: Saranya Kumar's Story

Saranya Kumar, an IDEALITE, was featured in *The School of You,* a mental health platform, where she shared her journey of raising a child with T1D. In the interview, Saranya spoke openly about the invisible labor of caregiving—the fear of mistakes, the stigma of chronic illness, and the emotional weight carried silently by parents. She also reflected on resilience, adaptation, and the importance of mental health for both children with T1D and their caregivers.

July 2025 – Mattel Launches Barbie with Type 1 Diabetes

In July 2025, Mattel launched the first Barbie with T1D, created in partnership with *Breakthrough T1D*. Key features:

- Continuous glucose monitor (with Barbie-pink heart tape)
- Insulin pump on her waist
- Blue polka-dot outfit symbolizing diabetes awareness
- Matching pastel purse for T1D essentials

The launch was celebrated at the Breakthrough T1D Children's Congress in Washington, DC, and honored global T1D advocates Robin Arzón and Lila Moss with one-of-a-kind dolls. This milestone brings visibility, representation, and inclusion to children living with T1D — showing that every story belongs in play.

13 July 2025, Cubbon Park, Bangalore – Type One Run/Walk

The July edition of the Type One Run/Walk was held at Cubbon Park, with participants completing a 5 km run/walk, followed by a warm meet-and-greet session. It was a joyful morning with a good turnout — some long-time T1D friends reunited, while many new bonds were formed among first-time participants. The event highlighted the spirit of community, friendship, and mutual support within the T1D circle.

15 July 2025, Bangalore – Children's Diabetes Camp & 'Diabetes Besties' Launch

The Indira Gandhi Institute of Child Health (IGICH), in collaboration with Novo Nordisk GBS, hosted a warm and joyful camp for children with T1D, marking the launch of the *'Diabetes Besties'* initiative. Nearly 60 children and their parents came together to share, learn, and celebrate.

Key Highlights

* Scholarships for six children with good glycemic control and academics
* Fun activities: drawing, tattoos, and a magic show
* Healthy snacks and lunch for families
* Free insulin support (Tresiba, Novorapid).

13 August 2025, Online – Exam-Smart with T1D Workshop

A free online workshop, *Exam-Smart with T1D*, was organized by IDEALite Ms Vaishali Vakil, for students of Classes 9–12 living with T1D, and their parents. The Speaker was Dr. Manoj Bhatwadekar (Head of JDF Mental Health Team).

Key themes included:

- Coping with exam anxiety without compromising blood glucose
- Enhancing parent–teen communication

- Practical real-life tips for exams with T1D
- Interactive Q&A with participants

The session offered families effective strategies to balance academic performance with diabetes management. More than 50 families attended the session, pan-India.

14 August 2025, Online – OPDE Session

IDEAL conducted the next session in its *Ongoing Pediatric Diabetes Education (OPDE)* series on the theme *"20 Years of T1D Advocacy – The Do's and Don'ts."* The Speaker was Ms Shuchy Chugh. The interactive session highlighted key lessons from two decades of advocacy in T1D, offering practical guidance to clinicians and educators. It was well attended and warmly appreciated. OPDE sessions aim to continue the process learning and professional development for IDEALites.

21 August 2025, Online – Virtual Symposium: Bridging the Care Gap

A virtual symposium on *"Bridging the Care Gap: Clinicians and People Living with T1D"* was organized by IDEALite Ms Riddhi Modi, with Empower T1D and T1EUP. The Speaker was Dr. Saurabh Uppal (Pediatric Endocrinologist, ENDOKIDZ Clinics), and the Moderator Dr Siddharth Madnani (Director, Madnani Hospital, Prayagraj).

Key highlights included:

- Strengthening patient–clinician partnerships in T1D care
- Sharing perspectives of both providers and people living with T1D
- Exploring collaborative strategies to improve outcomes

The session concluded with an engaging Q&A, addressing queries from participants.

24 August 2025, 9:00 AM–1:00 PM, AMCOSA Hall, Visakhapatnam – DCS Camp for Children with T1D

The Diabetic Child Society (DCS) hosted a half-day camp for children with T1D, attended by 207 participants from six districts and three neighbouring states. The program focused on diabetes care, education, and sick-day management.

Highlights included:

- Free insulin, syringes, pen needles, lancets, and glucometer strips for each child
- On-site HbA1c testing and retinal evaluations by Visakha Eye Hospital
- Safe disposal of syringes, pen needles, and e-waste with support from IYFS
- Interactive learning and peer engagement

The camp was honored by the presence of Shri Bhanoji K. Venkat from Vizagapatam Chamber of Commerce & Industry, who visited to understand the Society's work. Special thanks were extended to Endocrinology PGs,

pharma volunteers, students, and supporters, and to Dr Graham Ogle & the Life For A Child team for providing glucometers and strips. The event reflected DCS's commitment to empowering children and families through education, care, and community support.

24 August 2025 NMDC Hyderabad Marathon

Bound by T1D, breaking limits together – 50+ warriors & caregivers ran strong at NMDC Hyderabad Marathon 2025, in 10k and Half Marathon. The organizations which participated included Sweet Souls, Tamil Nadu Type 1 Foundation, UDAAN, and Type 1 Diabuddies of Karnataka. It was heartwarming to have T1D Warriors & Caregivers from across states – turning miles into milestones!

3 September 2025, Sweet Souls Society Meets Andhra Pradesh DME to Strengthen T1D Care

Sweet Souls Society recently had the honor of meeting Dr Raghunandan**,** the newly appointed Director of Medical Education (DME) for AP. During the meeting, the Society submitted a formal representation advocating for stronger support systems and improved care for people living with **T1D** across the state.

Led by President Lakshminarayana Varimadugu and Founder & Joint Secretary Ramesh Kidambi, the delegation highlighted urgent challenges:

- Delayed diagnosis and risk of early complications due to unstable blood sugars
- Financial hardships in accessing essential supplies like analog insulins and glucometer strips
- Need for free, T1D-suitable analog insulins and testing strips statewide

The team also shared successful care models from Telangana, Tamil Nadu, Karnataka, and Kerala.

In response, Dr. Raghunandan assured:

- Analog insulins will soon be available at district government general hospitals
- A dedicated committee on T1D care will be formed
- Sweet Souls Society advocates will be included in the committee

This meeting marks a significant step toward a healthier, more supportive future for children and families living with T1D in AP.

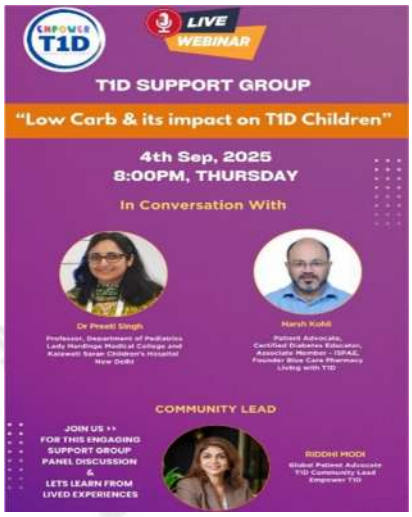
4 September 2025, New Delhi – GST Relief for Diabetes Management

The Govt of India's new GST rationalization package will bring significant relief to families managing diabetes by lowering the cost of medicines, devices, and nutrition essentials. **Key Diabetes-Specific Reforms** included**:**

* **Medical Devices:** CGM sensors, earlier taxed at 18%, have now been moved to 5%. Similarly, glucometers, test strips, and syringes, have been moved from12% to 5%, lowering daily monitoring costs.
* **Essential Medicines:** GST on life-saving drugs, including those for chronic illnesses like diabetes, reduced from 12% to 5% or Nil.
* **Insurance Relief**: Health insurance policies have been exempted from GST, making coverage more affordable for families with long-term health needs.
* **Diabetic Foods:** Specialized foods for diabetes management reduced from 12% to 5%, encouraging healthier dietary choices.

The reforms aim to ease financial stress on households living with diabetes, where lifelong treatment and monitoring impose a heavy burden. By making diabetes care more affordable and accessible, the government has taken a crucial step towards preventive healthcare and improved quality of life for millions.

4 September 2025, Online – T1D Support Group Webinar



A support group webinar on *"Low Carb & its Impact on T1D Children"* was organized by Empower T1D. The Speakers were Prof Preeti Singh (Lady Hardinge Medical College & Kalawati Saran Children's Hospital, New Delhi) and IDEALite Mr Harsh Kohli (Patient Advocate, Certified Diabetes Educator), with Community Lead IDEALite Ms Riddhi Modi (Global Patient Advocate, T1D Community Lead, Empower T1D).

Key highlights included:

- Clinical perspectives on low-carbohydrate diets in children with T1D
- Lived experiences and practical challenges faced by families
- The importance of balanced nutrition for growth and development
- Open discussion and Q&A with participants

The session provided valuable clinical insights and real-world experiences to guide families navigating dietary choices for children with T1D.

5 September 2025 – IDEAL Launches Social Media Channels

IDEAL has officially launched its social media presence to share educational updates and resources on Type 1 Diabetes.

- **Facebook:** https://www.facebook.com/share/1BRhEABtY6/
- **Instagram:** https://www.instagram.com/ideal_diabeteseducation/
- **X (Twitter):** https://x.com/ideal_diabetese

Follow and subscribe to stay informed, and share the links with friends and families who may benefit.

Yog Dhyan Foundation (YDF) Quarterly Report (July–September 2025)

YDF continues its journey of support for children and families living with T1D through health camps, virtual sessions, and special events.

July 2025: Over 400 participants benefited from **a** free HbA1c Camp on 6 July, which also had Dr Anil Vedwal launching the Diabetes Management Supplies Records Booklet (DMSRB), in the presence of Mr Rummy Chhabra, Ms Bindia Chhabra, and Ms Vani (The Bigger Picture). On 12 July, an Exclusive Comedy Fundraiser curated by Dr Srishti Puri and headlined by The Glucose Goddess, Laura Lastoria (living with T1D) raised some funds for YDF. On 13 July, in the monthly virtual session, Dr. Aashima Dabas (Delhi) spoke on *T1D Management with Limited Financial Resources,* sharing practical, low-cost strategies for effective diabetes care. Joining her were panelists Dr Archana Sarda (Aurangabad), Mr Gagan Deep (Chandigarh), Ms Savita Agarwal (Mumbai), and Ms Kashis (YDF Warrior).

August 2025: YDF Camps 3 & 31 August had yoga, diabetes education, counseling, leadership talks, a gluten-free food stall, distribution of supplies, with special attention to children with HbA1c > 10%. On 17th August, the online meeting had Mr Harsh Kohli discuss *Preventing Hypoglycemia,* focusing on how schools and teachers can play a vital role in preventing hypos, with Ms Gunjan Sahni the Hero of the month and panelists Dr Shuchy Chugh and Dr Srishti Puri.

September 2025: The Quarter-End Camp on 13 Sept, had Ms Madhurma Jain (President, Rotary Club) as Guest of Honor. The monthly session on 14 Sept, featured Ms Sirisha Mantha emphasized breaking fear of outstation trips by raising awareness. The Hero of the Month was Ms Aarna Dua (11y old). Panelists included Ms Tanisha, Ms

Preeti, M. Simranjeet Kaur, Ms Gunjan Sahni and Dr Shruti Arora. Full recordings of these sessions are available on the **YDF YouTube channel** for those who wish to learn more.

YDF is proud to support, among others, Kashish (very poor family, now in college); Naman, now a national-level skipping sports player, and two single mothers. From free medical camps to insightful knowledge sessions and even an innovative comedy fundraiser, YDF ensured children with T1D and their families felt supported, informed, and empowered.

14 September 2025, Raichur, Karnataka – Family & Support Group Meet

A T1D family and support group meet was organized by Dr Chaithra KR, Pediatric Endocrinologist at Badrinarayan Hospital, Raichur.

Over 40 families participated in the program, which featured:

- Patient education sessions
- Interactive discussions with families and children
- Recognition and prizes for students with T1D who excelled in exams
- Charity activities and community support initiatives

The event fostered learning, encouragement, and peer bonding among families living with T1D.

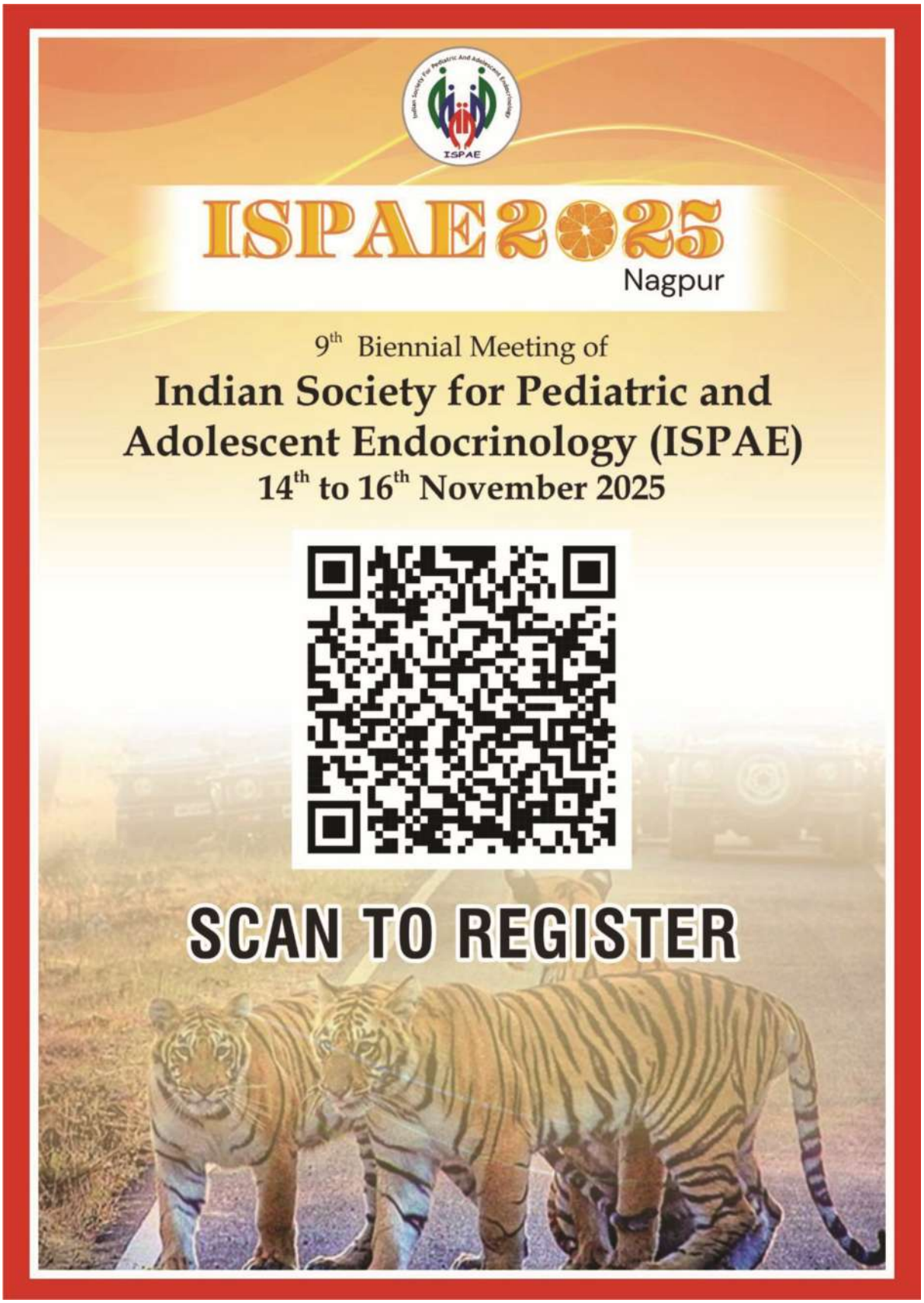
TRAINEES SECTION

Aashima Dabas *Professor, Dept of Pediatrics, Maulana Azad Medical College, New Delhi*

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

https://forms.gle/rSEUkE2uNkyzAsY19

Last Date 10th October 2025


ISPAE2025
Nagpur
9th Biennial Meeting of
Indian Society for Pediatric and Adolescent Endocrinology (ISPAE)
14th to 16th November 2025
SCAN TO REGISTER