

# CAPE News



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## EDITOR'S MESSAGE

Dear Readers,

Greetings from the CAPE News Editorial team! As we proudly enter our **30th year of publication** as the voice of ISPAE, this landmark issue explores a profound theme: **"Environment, Spirituality & Pediatric Endocrinology."**



Our patients do not heal in a vacuum. This edition challenges us to look beyond lab values and explore the unseen forces shaping the modern child's endocrine ecosystem:

- **The Spiritual Axis:** Understanding how mindfulness mitigates HPA-axis stress, and how families use adaptive coping to navigate Type 1 Diabetes (T1D) care.
- **Modern Environmental EDCs:** Exploring how Artificial Light at Night (ALAN) from digital screens acts as a non-chemical EDC to disrupt puberty and metabolism.
- **Clinical Overexposures:** Examining the hidden endocrine risks of unregulated essential oils and "natural" supplements, alongside their underlying epigenetic mechanisms.

Simultaneously, ISPAE continues its vigorous grassroots growth. From rolling out the **ISPAE CARE** clinical algorithms to celebrating the landmark integration of free childhood diabetes care under the Government's new **RBSK 2.0** initiative, our collective footprint is stronger than ever.

As we prepare to reconnect at the **ISPAE 2026 Midterm Meeting in Ahmedabad this October**, let these pages remind us that to treat the gland, we must understand the child's entire world.

Keep learning and shining!

Your feedback is always welcome at [editor.capenews@gmail.com](mailto:editor.capenews@gmail.com).

Regards,  
Nikhil Lohiya  
Team CAPE News



## ISPAE PRESIDENT- MESSAGE

Dear Colleagues and Friends,

It is a pleasure to write this message for CAPE News, and I warmly congratulate the Editorial Board for bringing out another excellent issue. This edition is particularly special as CAPE News enters its 30th year, a remarkable milestone that reflects its enduring value as an academic and professional voice of ISPAE.

The current issue is both distinctive and thought-provoking in its theme, "Environment, Spirituality & Pediatric Endocrinology." The scientific content is rich, contemporary, and highly relevant to present-day pediatric endocrine practice. The issue brings together important discussions on the interface between science, society, beliefs, and environment in shaping endocrine health. The Mini-review on diabetes, spirituality, supernatural beliefs, and the sociocultural environment, the Drug Corner on the endocrine exposome and unintended endocrine effects of everyday exposures, and the Biochemistry Corner on endocrine-disrupting chemicals in childhood, together provide a compelling and multidimensional perspective. This issue reminds us that pediatric endocrinology today must look beyond hormones and laboratory values alone. Environmental exposures, family belief systems, psychosocial influences, and spiritual coping all shape how children and families experience endocrine disease and respond to treatment.

At the Society level, several important academic initiatives are moving forward. ISPAE is actively developing guidance documents and consensus statements on congenital hypothyroidism (CH), type 1 diabetes mellitus (T1DM), disorders/differences of sex development (DSD), and GLP-1 receptor agonists, with the aim of providing practical, evidence-based, and contextually relevant recommendations for clinicians across the country. These documents will be important steps toward standardizing care and supporting pediatricians, trainees, and pediatric endocrinologists in everyday practice.

Another major initiative is ISPAE CARE, our effort to create concise and practical clinical algorithms in pediatric endocrinology. In busy clinical settings, such tools can significantly improve decision-making, reduce variability in care, and strengthen the translation of evidence into bedside practice. ISPAE CARE represents our commitment to making high-quality endocrine care more structured, accessible, and implementable.

I also take this opportunity to invite all members to the ISPAE Mid-Term Meeting in Ahmedabad. This promises to be an exciting academic event, with dedicated focus on pediatric diabetes and obesity, interactive workshops, and strong national and international faculty participation. I encourage all members, especially trainees and young colleagues, to participate enthusiastically.

Once again, my heartfelt congratulations to the CAPE News Editorial Board for this excellent issue. May CAPE News continue to inform, inspire, and unite our growing community of pediatric endocrine professionals.

With warm regards,

**Dr Anurag Bajpai- on behalf of ISPAE 2025-2026**



## Welcome New Members

| Life Members                                                                                                                                                                                                                                                                                                              | Associate Life Members                                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                                     |
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**WINNERS - March 2026 Quiz: CONGRATULATIONS!!**  
**Dr Ayush Agarwal, Dr Ram Murty Shastry, Dr Urvee Swaika**

## BEYOND MOLECULES: SPIRITUALITY AND THE ENDOCRINE SYSTEM

Chaitra KS & Vani HN, IG Institute of Child Health, Bengaluru



“The endocrine system measures everything in molecules, yet some of its strongest influences may originate from experiences that cannot be measured in molecules alone.”

Endocrinology is traditionally viewed through the lens of hormones, receptors, and signaling pathways. However, advances in neuroendocrinology and psychoneuroimmunology have revealed that psychological and spiritual states can influence endocrine function through measurable biological mechanisms. Spirituality, defined as a sense of meaning, purpose, connectedness, and inner harmony, is increasingly recognized as a determinant of health that extends beyond the mind into hormonal and metabolic regulation.<sup>1,3,6</sup>

The most established connection between spirituality and endocrinology is through the hypothalamic-pituitary-adrenal (HPA) axis. Chronic psychological stress activates the HPA axis and sympathetic nervous system, resulting in sustained cortisol secretion, inflammation, insulin resistance, visceral adiposity, sleep disturbances, and impaired metabolic health. Persistent activation of these pathways imposes a substantial allostatic load, shifting the body toward a prolonged survival state at the expense of growth, repair, and reproductive functions.<sup>3,6</sup> Spiritual practices such as meditation, yoga, prayer, and mindfulness appear to modulate this response. Studies have demonstrated reduced perceived stress, enhanced emotional resilience, improved autonomic balance, and better psychological well-being among regular practitioners.<sup>2,3</sup> These effects are mediated through reduced sympathetic activation, enhanced parasympathetic tone, and attenuation of stress-responsive neuroendocrine circuits. In essence, spirituality may not remove external stressors, but it can alter the body's physiological response to them.

Beyond stress regulation, spirituality may influence endocrine physiology through bioenergetics. Hormones fundamentally govern the acquisition, storage, and utilization of energy. Insulin secretion depends on ATP generation within pancreatic  $\beta$ -cells, while steroidogenesis in the adrenal glands and gonads begins within mitochondria. Thus, endocrine function is inseparable from cellular energy metabolism.<sup>1</sup> Chronic stress is associated with oxidative stress, mitochondrial dysfunction, and metabolic inefficiency. Spiritual practices may improve biological efficiency by reducing the inflammatory burden and optimizing energy allocation, allowing physiological resources to be redirected toward growth, maintenance, and recovery.<sup>1,6</sup>

Among spiritual interventions, meditation has generated the most compelling scientific evidence. A systematic review of Isha Yoga practices demonstrated significant improvements in mental well-being, stress reduction, and physiological health outcomes.<sup>2</sup> Participation in structured meditation programs has been associated with reductions in HbA1c and systemic inflammatory markers, improved lipid profiles, enhanced heart-rate variability, and improved autonomic regulation.<sup>2</sup> Furthermore, yoga-based interventions have shown favorable effects on endocrine harmony by promoting autonomic balance and reducing stress-mediated hormonal dysregulation.<sup>4</sup>

Recent research has also highlighted a potential gut-brain-endocrine axis, wherein meditation and lifestyle modifications influence gut microbial diversity and metabolite production, potentially contributing to metabolic and endocrine benefits.<sup>2</sup> These findings suggest that spirituality exerts multisystem effects that extend beyond psychological well-being.

The pineal gland represents a fascinating intersection between spirituality and endocrinology. Through melatonin secretion, it regulates circadian rhythms, sleep, metabolism, and reproductive physiology. Historically referred to as the “third eye” in several philosophical traditions, the pineal gland symbolizes the enduring human attempt to understand the relationship between consciousness and physiology. Modern endocrinology increasingly recognizes that circadian integrity is fundamental to hormonal homeostasis and overall health.<sup>5</sup>

Spirituality should not be viewed as an alternative to evidence-based endocrine care. Rather, it serves as a complementary dimension of health that influences neuroendocrine regulation, autonomic function, metabolism, and cellular energetics. The emerging paradigm suggests a continuum in which spiritual experiences shape neural activity, neural networks regulate endocrine signaling, and endocrine pathways ultimately determine the body's

capacity for adaptation, resilience, and well-being. As endocrinologists, understanding this interface may provide opportunities to integrate holistic approaches with conventional therapies to improve long-term patient outcomes.

## References

1. Muthusamy S. Bioenergetic Trinity: aligning spirit, hormones, and nature for bliss. *Indian J Endocrinol Metab.* 2025;29(6):681-683.
2. Giridharan S, Pandiyan B, Kumar NV, Godbole M, Soumian S. Effects of Isha Yoga practices on health outcomes: a systematic review of controlled studies. *Cureus.* 2026 Jan 13;18(1):e101478. doi: 10.7759/cureus.101478.
3. Pascoe MC, Thompson DR, Ski CF. Meditation and endocrine health and wellbeing. *Trends Endocrinol Metab.* 2020 Jul;31(7):469-477. doi: 10.1016/j.tem.2020.01.012.
4. FOGSI Endocrinology Committee. Yoga and endocrine harmony. *Endo Insights.* 2021 Jun;1(1):1-4.
5. Cleveland Clinic. Pineal gland: what it is, function and disorders. Cleveland (OH): Cleveland Clinic; 2026 [cited 2026 Jun 6].
6. Kotwal N, Sheikh S. Spiritual endocrinology. *Indian J Endocrinol Metab.* 2016 Nov-Dec;20(6):857-859. doi: 10.4103/2230-8210.192920.

## MINI REVIEW

### DIABETES, SPIRITUALITY, SUPERNATURAL BELIEFS AND THE SOCIOCULTURAL ENVIRONMENT: A HOLISTIC PERSPECTIVE

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



## Introduction

Medical science is continuously evolving, advancing in its understanding of disease mechanisms and improving approaches to diagnosis, prevention, and treatment. The management of endocrine disorders, particularly diabetes mellitus (DM), has undergone remarkable transformation with advances in pharmacotherapy, structured education, precision medicine, blood glucose monitoring (BGM) systems, insulin analogs, insulin pumps, continuous glucose monitoring (CGM), and hybrid closed-loop technologies. These developments have significantly improved metabolic outcomes, quality of life, and survival.

However, despite scientific advancement and increasing medical knowledge, disease understanding and treatment behavior continue to be strongly influenced by cultural beliefs, spirituality, social conditioning, and supernatural interpretations of illness.

Across societies, superstition, non-scientific thinking, and supernatural beliefs continue to influence how individuals perceive illness, seek treatment, and cope with chronic disease. Supernatural beliefs refer to beliefs in phenomena that transcend scientific explanation and appear real to believers despite lacking empirical evidence. Such beliefs may include attribution of illness to divine punishment, witchcraft, evil spirits, planetary influences, fate, karma, curses, or spiritual imbalance. Although these beliefs often emerge from cultural and historical traditions, they continue to influence healthcare-seeking behavior even in technologically advanced medical environments.

## Historical Perspectives: Spirituality and Rationality in Healing

The coexistence of scientific medicine and supernatural beliefs reflects both the complexity of human cognition and the historical evolution of healing practices. Many ancient healing traditions attempted to explain illness through spiritual or metaphysical frameworks before the advent of biomedical science.

At the same time, history demonstrates the emergence of rationality within traditional systems of medicine themselves. In classical Indian medicine, Charaka introduced a rational perspective toward disease causation and management through the concept of *Yukti Vyapashraya* (logical and rational therapeutics), in contrast to *Daiva Vyapashraya* (divine or faith-based interventions). This distinction illustrates an early recognition that disease could be approached through observation, reasoning, and therapeutic interventions rather than exclusively through spiritual means.

Despite contemporary scientific progress, many individuals continue to interpret illness through culturally conditioned beliefs. Social media platforms increasingly amplify misinformation and non-scientific health

practices, often promoting rituals, miracle cures, dietary myths, or fear-based interventions unsupported by evidence. Such narratives may become particularly persuasive during emotionally vulnerable periods, including diagnosis of chronic disease, uncertainty regarding prognosis, or treatment failure.

## Neuropsychology of Spiritual and Supernatural Beliefs

Research in neuropsychology and cognitive sciences suggests that supernatural beliefs may be deeply linked to human cognition. During the early 2000s, the concept of a so-called “Godspot” in the brain stimulated interest in neurotheology and the neurological correlates of spiritual experience.

Although simplistic localization theories remain debated, researchers increasingly recognize that cognitive biases, emotional needs, pattern recognition, existential concerns, and sociocultural influences shape spiritual and supernatural beliefs. Humans naturally seek meaning, predictability, and control during times of uncertainty; consequently, chronic illness may increase susceptibility to spiritual interpretations of suffering.

## Diabetes as a Biopsychosocial and Emotional Challenge

In chronic endocrine disorders, particularly DM, psychosocial and spiritual dimensions become highly relevant. Diabetes is not merely a metabolic disorder requiring pharmacological treatment; it is a demanding lifelong condition requiring constant vigilance, behavioral adaptation, emotional resilience, and family engagement.

Type 1 diabetes (T1D), especially in children and adolescents, introduces profound disruptions in daily life. Diagnosis generates uncertainty, fear, grief, guilt, anxiety, and disruptions in family routines. Parents and caregivers suddenly confront complex responsibilities involving BGM, insulin administration, nutritional management, school coordination, hypoglycemia prevention, and emergency preparedness.

The contemporary treatment of diabetes further adds cognitive and emotional complexity. Increasingly sophisticated technologies require not only access but also considerable health literacy, cognitive flexibility, digital competence, and emotional readiness. Families and individuals must interpret numerical data, understand glycemic variability, troubleshoot alarms, calibrate devices, respond to trend arrows, and make ongoing therapeutic decisions. While technology reduces disease burden in many ways, it may paradoxically create new psychological stressors, including alarm fatigue, data overload, treatment anxiety, and feelings of inadequacy.

## Understanding Spirituality and Religion in Diabetes Care

Within this context, spirituality often emerges as an important coping resource. Spirituality broadly refers to the search for meaning, connectedness, hope, transcendence, or faith and may or may not involve organized religion. Religion, in contrast, often encompasses structured beliefs, rituals, institutions, and collective practices. For many individuals living with diabetes, both spirituality and religiosity can provide emotional grounding and psychological resilience during periods of uncertainty and stress.

Following diagnosis of diabetes in a child, caregivers often seek information to understand the illness and reduce anxiety. Simultaneously, many families seek emotional support through religious and spiritual practices, including prayer, meditation, reflection, participation in faith communities, or trust in divine support. Spirituality may help caregivers reinterpret suffering, maintain hope, and develop emotional endurance during difficult phases of treatment adjustment.

## Religious and Spiritual Coping (R/SCOPE)

The use of religious beliefs and spiritual practices to manage stressful situations is conceptualized as **Religious and Spiritual Coping (R/SCOPE or SRCOPE)**. Coping strategies refer to cognitive attitudes and behavioral responses adopted to manage stressful life events.

Religious and spiritual coping may function either adaptively or maladaptively, depending on how beliefs influence behavior and decision-making.

## Positive Religious and Spiritual Coping

Positive religious and spiritual coping includes:

- ☐ Seeking emotional comfort through prayer
- ☐ Interpreting adversity as meaningful
- ☐ Receiving support from religious communities
- ☐ Cultivating hope and optimism
- ☐ Engaging in meditation and reflection
- ☐ Maintaining trust in one's ability to endure hardship.

Studies suggest that participation in religious activities and positive spiritual coping is associated with improved emotional well-being, greater life satisfaction, lower perceived stress, reduced anxiety, and better quality of life among individuals living with chronic diseases.

In diabetes care, positive spiritual coping may improve disease acceptance, treatment adherence, emotional regulation, and resilience among both patients and caregivers.

Caregivers of children with T1D frequently describe spirituality as a source of emotional containment during periods of overwhelming distress. Prayer, reflection, and trust in God may reduce anxiety, foster hope, and provide psychological reassurance. Spiritual beliefs may strengthen caregivers' capacity to continue demanding caregiving responsibilities and adapt to the relentless routines imposed by diabetes management.

Furthermore, spirituality may indirectly improve diabetes outcomes through stress reduction. Psychological stress, anxiety, and depression are common among individuals with T1D and their caregivers and may adversely affect glycemic control through behavioral mechanisms and physiological stress pathways. In such circumstances, adaptive spiritual practices may improve emotional stability and foster healthier coping responses.

## The Double-Edged Nature of Spirituality and Supernatural Beliefs

Spirituality and supernatural beliefs can function as a double-edged sword. When integrated thoughtfully with evidence-based care, spirituality may be psychologically protective. However, maladaptive supernatural beliefs can delay diagnosis, interfere with treatment adherence, and worsen outcomes. Endocrine disorders are often chronic – including thyroid disorders, differences in sex development, infertility, obesity, short stature, and genetic syndromes. Evidence from mental health research demonstrates that supernatural interpretations - attributing them to curses, evil spirits, witchcraft, divine punishment, karma, or social stigma - remain barriers to care, delaying care-seeking and discouraging timely medical intervention. A study from Chandigarh reported that many individuals attributed psychiatric symptoms to sorcery (*Jaadu Tona*), celestial influences (*Grah Nakshatra*), karma, spirit possession, ghosts, or divine wrath, and believed magico-religious rituals alone were sufficient treatment. Such beliefs contributed to delayed access to healthcare and increased morbidity. Similar mechanisms may operate in endocrine disorders when individuals prioritize miracle cures, unverified alternative therapies, or ritualistic interventions over scientific treatment.

## The Sociocultural Environment and Diabetes Management

The sociocultural and environmental context profoundly shapes diabetes management.

The environment encompasses family systems, healthcare access, socioeconomic conditions, education, health literacy, digital literacy, peer support, and cultural norms. Supportive environments encourage healthy behaviors, treatment adherence, and effective technology use. Conversely, financial constraints, illiteracy, poor healthcare accessibility, stigma, misinformation, social embarrassment, and technological inequities may intensify disease burden. Children with diabetes living in supportive family environments are more likely to demonstrate better treatment adherence and healthier psychological adjustment. Families with adequate resources and education may more successfully navigate insulin administration, CGM interpretation, carbohydrate counting, and clinic engagement. In contrast, stigma, fear of discrimination, inadequate educational support, and misconceptions surrounding diabetes may contribute to concealment, emotional distress, and poor adherence.

## Toward a Biopsychosocial-Spiritual Model of

Diabetes Care therefore requires a biopsychosocial-spiritual approach rather than an exclusively biomedical model. Scientific treatment must remain central and evidence-based. However, clinicians should also acknowledge spirituality, belief systems, emotional distress, and sociocultural context while guiding patients compassionately toward informed medical decisions. Rather than dismissing spiritual beliefs outright, healthcare professionals should evaluate whether they function adaptively—providing comfort, meaning, and resilience—or maladaptively by delaying treatment or promoting harmful practices.

## Conclusion

Diabetes care lies at the intersection of science, psychology, family systems, culture, spirituality, and environment. Medical advances have transformed outcomes; however, successful long-term management depends equally upon emotional resilience, cognitive capacity, health literacy, supportive environments, and balanced spiritual coping.

Integrating these dimensions into patient-centered care may improve treatment adherence, quality of life, psychological well-being, and holistic outcomes for children, adolescents, and families living with diabetes, and other endocrine disorders or deficiencies.

## References:

- 1: Khare J, Pendharkar PS, Kalra S, Jindal S. Endocrinology and Supernatural Beliefs; A Review. Indian J Endocrinol Metab. 2025;29(1):39-42.
- 2: da Silva AP, Araujo ACMC, Mesquita IMR, et al. Religious/spiritual coping, symptoms of depression, stress, and anxiety in caregivers of children and adolescents with type 1 diabetes. Fam Pract. 2022;39(6):1017-1023.



## ARTIFICIAL LIGHT AT NIGHT: THE HIDDEN ENDOCRINE DISRUPTOR OF THE DIGITAL AGE

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

In clinical practice, the pediatric endocrinology fraternity has become increasingly focused on endocrine-disrupting chemicals (EDCs). Over the past three decades, compounds such as bisphenol A (BPA), phthalates, per- and polyfluoroalkyl substances (PFAS), and agricultural pesticides have drawn intense scientific, public, and regulatory attention. As a result, parents are often advised to use metal water bottles and ceramic rather than plastic food containers, check baby bottles for BPA-free labels, and filter drinking water to reduce exposure to these widespread toxicants.

However, while society heavily regulates what we ingest and touch, we largely ignore the endocrine disruption entering through our retinas. Artificial light at night (ALAN) is a subtle yet significant factor in endocrine disruption, occurring through both outdoor environmental lighting—such as billboards and municipal LED streetlights—and indoor electronic screens like televisions, tablets, and smartphones. Emerging evidence suggests that ALAN is not merely a behavioral or environmental concern but may function as an environmental endocrine disruptor capable of altering hormonal ecosystems, metabolic milieu, reproductive potential, and stress responses.<sup>1</sup>

Unlike chemical EDCs that require ingestion or absorption, ALAN is a *non-chemical* disruptor. It utilizes neurological pathways to interfere with hormone biosynthesis and metabolism, producing immediate downstream effects. The biological consequences of this exposure extend far beyond transient sleepiness. Chronic exposure to ALAN is unequivocally linked to widespread endocrine dysregulation, characterized by melatonin suppression, altered glucocorticoid pulsatility, and the uncoupling of central and peripheral biological clocks.<sup>1</sup>

## The circadian - endocrine cross talk:

The endocrine system and circadian clocks are closely integrated. The hypothalamic suprachiasmatic nucleus (SCN) acts as a central clock, using light as the primary cue to synchronize peripheral clocks across the body.<sup>1</sup> Light signals reach the SCN via specialized retinal cells. Nighttime light exposure disrupts circadian phases and suppresses melatonin, a hormone that signals darkness and regulates metabolism, sleep, reproduction, and immunity. Since hormones like cortisol, insulin, and growth hormone follow daily rhythms, nocturnal light exposure can simultaneously dysregulate multiple endocrine pathways.

### **Chronodisruption and melatonin suppression:**

The retino-hypothalamic tract serves as the primary pathway for endocrine disruption triggered by ALAN. While traditional rods and cones facilitate conscious image formation, the inner retina also houses intrinsically photosensitive retinal ganglion cells (ipRGCs) that detect environmental light. These ipRGCs, which contain the photopigment melanopsin, exhibit a unique sensitivity to short-wavelength blue light, with peak sensitivity occurring between 460 and 480 nm (2). This specific part of the light spectrum is heavily emitted by modern backlit digital screens and LED lighting systems.

ALAN rapidly halts nocturnal melatonin production, even at minimal lux levels like streetlights or phone notifications. This suppression removes a vital endocrine regulator, as melatonin acts as a free-radical scavenger and epigenetic modulator. Consequently, its absence disrupts other hormonal rhythms, leading to elevated evening cortisol and dysregulated thyroid-stimulating and growth hormone pulsatility. This circadian interference causes "chronodisruption," where the suprachiasmatic nucleus falls out of sync with peripheral clock genes like CLOCK and BMAL1. This internal desynchronization transitions the body from a restorative state to one of chronic, low-grade stress.<sup>2</sup>

### **ALAN and metabolic endocrine disruption:**

This, perhaps, represents one of the most clinically significant areas of modern pediatric endocrinology. While poor dietary habits and sedentary behavior are the primary targets for intervention, chronodisruption via digital screens and light pollution is rapidly emerging as a powerful, independent driver of metabolic pathogenesis. A comprehensive review by Tang et al. found that exposure to peak levels of ALAN correlates with a 14% higher risk of obesity and a 7% higher risk of being overweight. These metabolic impacts appear to affect adolescents and adults with equal severity.<sup>3</sup>

Chronic chronodisruption alters appetite-regulating hormones. Suppressed nocturnal melatonin upregulates ghrelin and suppresses leptin, increasing caloric intake during the biological night when insulin sensitivity is lowest. Internal desynchronization of peripheral clocks in pancreatic and muscle tissues downregulates GLUT4 translocation, causing systemic insulin resistance. Furthermore, chronic ALAN exposure desynchronizes the liver's internal clock, resulting in unchecked lipogenesis and the harmful buildup of triglycerides in the liver parenchyma. This interference establishes a pathogenic "light-gut-liver axis," which contributes significantly to the progression of metabolic dysfunction-associated steatotic liver disease (MASLD).<sup>4</sup>

### **ALAN and pubertal timing:**

There has been a significant increase in the incidence of precocious puberty over the last ten years, a trend that accelerated during the Covid pandemic. While this surge is primarily linked to rising obesity rates and contact with EDCs, it also closely coincides with the dramatic expansion of digital light exposure from electronic devices. Melatonin is known to exert a strong inhibitory influence on the HPG axis, partially by modulating the secretion of kisspeptin, which is known for its permissive role in pubertal initiation. The chronic suppression of melatonin induced by excessive evening light exposure essentially removes this inhibitory tone, potentially triggering premature activation of the HPG axis.<sup>1</sup> Consequently, obtaining a detailed history of the patient's nocturnal light environment is becoming an essential component of evaluating idiopathic precocious or early puberty.

### **ALAN and HPA axis:**

Normal cortisol secretion follows a diurnal pattern: a sharp morning surge for alertness, followed by a nocturnal nadir around midnight, which facilitates cellular repair and immune modulation. Nocturnal light exposure overrides SCN-mediated HPA regulation, triggering signal cascades that flatten the diurnal cortisol curve. This chronodisruption leads to elevated nocturnal cortisol, inducing chronic physiological stress. Sustained glucocorticoid exposure subsequently promotes visceral fat deposition, peripheral insulin resistance, and hypertension.<sup>5</sup>

### **ALAN and Somatotrophic axis:**

ALAN triggers sleep fragmentation and phase delays that significantly impact the somatotrophic axis. For children and adolescents in active growth phases, the secretion of growth hormone (GH) is intricately linked to deep sleep patterns. Specifically, the most substantial GH pulses are concentrated during slow-wave (Stage N3) sleep,

typically occurring in the initial sleep cycle of the biological night. When sleep onset is postponed or slow-wave sleep is disrupted by ambient ALAN or late-night screen use, the amplitude of vital nocturnal GH pulses decreases. Such disturbances can interfere with downstream insulin-like growth factor-1 (IGF-1) signaling, which may limit linear growth potential, impede the development of lean muscle mass, and worsen metabolic imbalances.<sup>6</sup>

### ALAN and epigenetic translation:

The ability of both chemical and non-chemical endocrine disruptors to trigger epigenetic modifications is arguably one of their most concerning characteristics. Melatonin acts as a critical biochemical bridge, connecting the external light environment to the epigenome. Research has demonstrated that when ALAN eliminates nocturnal melatonin peaks, it disrupts the expression of histone deacetylases and DNA methyltransferases, resulting in irregular global DNA methylation.<sup>2</sup>

Such epigenetic instability is especially alarming during fetal or early postnatal growth. Consequently, if a child's developing neuroendocrine system faces persistent circadian disruption from maternal ALAN exposure or premature screen use, it may set a permanent course toward increased cancer risk, modified HPA-axis stress responses, and insulin resistance.

### Conclusion

ALAN represents a modern environmental challenge that directly impacts multiple endocrine systems. By suppressing melatonin production and disrupting circadian alignment, ALAN alters the function of central, metabolic, and adrenal hormonal axes. Children and adolescents are particularly vulnerable to these disruptions due to high levels of electronic media use, developmental changes in their sleep biology, during ongoing neuroendocrine maturation.

The established links between nocturnal chronodisruption, insulin resistance, and visceral adiposity suggest that the modern luminous environment should be recognized as an independent risk factor for pediatric metabolic and hormonal disorders. Importantly, optimizing circadian hygiene should be treated as a key priority alongside proper nutrition and physical activity.

### References:

1. Russart KL, Nelson RJ. Light at night as an environmental endocrine disruptor. *Physiology & behavior*. 2018 Jun 1;190:82-9.
2. Haim A & Zubidat AE. Artificial light at night: melatonin as a mediator between the environment and epigenome. *Philosophical Transactions of the Royal Society B: Biological Sciences*. 2015; 370(1667), 20140121.
3. Tang W, Dong S, Li Y. Impact of artificial light at night on obesity and overweight: a systematic review and meta-analysis. *BMC Public Health*. 2025 Dec 13;26(1):227.
4. Scheer FA, Hilton MF, Mantzoros CS, Shea SA. Adverse metabolic and cardiovascular consequences of circadian misalignment. *Proceedings of the National Academy of Sciences*. 2009 Mar 17;106(11):4453-8.
5. Bedrosian TA, Fonken LK, Nelson RJ. Endocrine effects of circadian disruption. *Annual review of physiology*. 2016 Feb 10;78(1):109-31.
6. Hagenauer MH, Perryman JI, Lee TM, Carskadon MA. Adolescent changes in the homeostatic and circadian regulation of sleep. *Dev Neurosci*. 2009;31(4):276-284.

## DRUG CORNER

### THE ENDOCRINE EXPOSOME: WHEN EVERYDAY EXPOSURES ACT LIKE DRUGS

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Pediatric endocrinologists routinely prescribe hormones, hormone antagonists, and metabolic therapies. Yet some of the most intriguing endocrine effects encountered in clinical practice arise from substances that were never intended to be drugs - like "harmless" essential oils, nutraceuticals, herbal preparations and plastics. We are increasingly witnessing a shift toward "environmental spirituality," a deep-seated desire among families to align their children's health with the perceived purity of the natural world. For many parents, choosing an essential oil or a traditional herbal supplement is more than a health choice; it is an act of faith in a holistic, "clean" lifestyle. Sometimes, there are unintended consequences.

## Case vignette 1: Type 1 diabetes and a naturopathy regimen

A 10-year-old girl with T1D presented with the history of being admitted 2y earlier in DKA, and started on a basal-bolus insulin regimen. A few months after diagnosis, the family sought advice from a naturopathy practitioner who claimed that diabetes could be “reversed.” Following his advice, insulin was discontinued completely, and a restrictive regimen of a very low-carbohydrate, high-protein diet along with daily ingestion of fenugreek oil, medium-chain triglyceride oil, and other oral supplements prescribed as part of the naturopathy protocol started. C-peptide levels were monitored serially: the observed values were interpreted by the practitioner as evidence of  $\beta$ -cell recovery and diabetes reversal. However, the parents became increasingly concerned about worsening dyslipidemia, with elevated total cholesterol and triglycerides, and somewhat elevated liver enzymes, despite acceptable glucose values, hence they visited our OPD. Following counselling, the restrictive diet and naturopathy medications and supplements were discontinued. Over the next few days on a normal diet, the child began to require insulin again, and was restarted on a basal bolus regimen. Presently, she is on regular follow-up, maintaining good time-in-range and growing well. The family attributed the apparent improvement in C-peptide levels to the naturopathy regimen, particularly the fenugreek-based supplements, but realized the harms of a very restrictive diet, which may prolong the partial remission (“honeymoon”) phase, creating the impression of disease reversal, but is not sustainable in the long run. Moreover, the rate of decline of residual  $\beta$ -cell function in T1D may be variable in different individuals, which may prevent acute decompensation for some time.

This case highlights the need for cautious interpretation of C-peptide trends in early T1D. It also raises important concerns regarding the metabolic safety of restrictive diets, high-fat supplements, and unregulated complementary therapies in children with chronic endocrine disorders.

Fenugreek (*Trigonella foenum-graecum*) seeds contain soluble fiber (galactomannan), saponins, steroidal sapogenins (including diosgenin), and 4-hydroxy-isoleucine, a compound reported to exert insulinotropic effects in animal models. Proposed mechanisms include:

- Delayed carbohydrate absorption via gel-forming fiber, reducing postprandial glucose excursions.
- Potential insulin secretion enhancement through 4-hydroxy-isoleucine, with in vitro and rodent data suggesting glucose-dependent insulin release.
- Modulation of insulin sensitivity via saponins and sapogenins, with some evidence of improved peripheral glucose uptake.

Small clinical trials and human studies, predominantly in adults with type 2 diabetes or mixed populations, report modest reductions in fasting glucose, postprandial glycemia and HbA1c, alongside improved insulin sensitivity markers. However, there is no robust evidence for fenugreek as an insulin substitute in T1D. Adverse effects and pharmacokinetic considerations for fenugreek include gastrointestinal discomfort, hypoglycemia (particularly when combined with insulin or sulfonylureas), and potential drug–drug interactions via CYP450 modulation. Fenugreek has been reported to interact with anticoagulants (e.g., warfarin) due to coumarin-like constituents and may alter platelet function. Safety in children is not well established; product variability, contamination, and inconsistent dosing further complicate risk assessment.

Regulatory oversight of “natural” products in general is limited, raising concerns about active constituent concentration, excipients, and microbial contamination.

## Case vignette 2: Topical essential oils and early secondary sexual changes

A 7-year-old boy presented with bilateral breast enlargement and intermittent nipple tenderness over 6–8 weeks. On targeted history taking, parents reported frequent application of commercially sold lavender and tea tree oil blends to the child’s skin as a calming night ritual. Examination showed prepubertal testes with palpable glandular breast tissue; growth and development otherwise appropriate. No other endocrine exposures were identified. Standard investigations including bone age, gonadotropins (LH/FSH), and sex steroid levels (estradiol and testosterone) were all within the prepubertal range.

## Lavender Oil in Females

In prepubertal girls, topical exposure to lavender oil (LO) is strongly associated with premature thelarche. Mechanistically, LO functions as an estrogen receptor alpha (ER $\alpha$ ) agonist; its major components, linalool and linalyl acetate, bind to the ligand-binding domain of ER $\alpha$  and recruit coactivators such as SRC-2 to enhance transcriptional activity. This molecular mimicry results in the upregulation of estrogen-responsive genes such as *GREB1*, *PGR*, and *CTSD*, which stimulate glandular breast growth even when systemic levels of endogenous estradiol and gonadotropins remain within the normal prepubertal range. Clinical observations confirm that this breast development is typically reversible, with tissue completely regressing or resolving within 3-6 months after the exposure to lavender-containing soaps, lotions, or diffusers is discontinued.

## Lavender Oil in Males

Prepubertal boys exposed to lavender oil products frequently present with gynecomastia, which is otherwise rare and considered pathological in this age group. While LO possesses weak estrogenic properties, its primary impact in males is through potent androgen receptor (AR) antagonism. Components like linalool competitively inhibit the binding of androgens to their receptors, thereby suppressing the expression of androgen-responsive genes such as *CYP4F8*, *SEC14L2*, and *UGT2B28*. Because androgens naturally inhibit breast tissue development in males, this blockade creates a local estrogen-androgen imbalance that allows for the proliferation of breast tissue. Documented cases show that the gynecomastia resolves within months, once exposure to lavender-infused balms, hair gels, or colognes is ceased.

## Tea Tree Oil in Females

Tea tree oil exhibits endocrine-disrupting potential in females similar to lavender oil, functioning as a weak ER $\alpha$  agonist. In vitro studies demonstrate that TTO can stimulate an estrogen-dependent luciferase response and upregulate endogenous genes like *MYC* and *CTSD* while decreasing the expression of *IGFBP3*. Although detailed clinical case reports of isolated premature thelarche caused exclusively by TTO are less common than those for LO, girls presenting with early breast development often have a history of using personal care products that contain a combination of both essential oils. The biological mechanism remains consistent: the oil's lipophilic monoterpenes mimic the action of endogenous estrogens to trigger premature mammary gland maturation. Clinical studies on women with hirsutism have shown that these oils can downregulate these same AR-target genes locally in hair follicles to reduce unwanted hair growth without significantly altering systemic hormone levels.

## Tea Tree Oil in Males

In prepubertal boys, tea tree oil is a recognized cause of prepubertal gynecomastia, typically arising from the use of hair gels or shampoos. TTO acts as a potent androgen receptor antagonist, with its major constituent, terpinen-4-ol, and other components like  $\alpha$ -terpineol inhibiting the transcriptional activity of genes stimulated by dihydrotestosterone. Specifically, TTO exposure blocks the induction of androgen-target genes like *CYP4F8* and *SEC14L2*. This competitive receptor antagonism effectively "neutralizes" the low levels of androgens present in prepubertal males, leading to an unopposed estrogenic effect at the breast tissue level. Evidence shows that the resulting breast enlargement regresses once the exposure is eliminated, such as when TTO drops are removed from a daily hair care routine.

## Conclusion

Clinical encounters frequently bridge biomedical care and families' environmental, cultural, or spiritual practices. Our role is to respectfully engage, identify safety risks, and integrate pharmacologic evidence into shared decisions. The two vignettes underscore that "natural" does not always mean safe, that product exposures can have endocrine effects, and that discontinuing established life-saving therapies like insulin carries risks. Thoughtful history taking, clear communication, and structured follow-up protect children's health while respecting family values.

## References:

1. Tak Y, Kaur M, Chitranashi A, Samota MK, Verma P, Bali M, et al. Fenugreek derived diosgenin as an emerging source for diabetic therapy. *Frontiers in Nutrition*. 2024 Feb 2;11:1280100.
2. Dikranian C, Hadara O, Lysy PA. Clinical parameters and emerging biomarkers of partial remission in pediatric type 1 diabetes: a systematic review. *Frontiers in Endocrinology*. 2026 Feb 9;17:1758848.
3. de Bock M, Lobley K, Anderson D, et al. Endocrine and metabolic consequences due to restrictive carbohydrate diets in children with type 1 diabetes: an illustrative case series. *Pediatric Diabetes*. 2018 Feb;19(1):129–37.
4. Ramsey JT, Li Y, Arao Y, Naidu A, Coons LA, Diaz A, Korach KS. Lavender products associated with premature thelarche and prepubertal gynecomastia: Case reports and EDC activities. *J Clin Endocr Metab*. 2019 Nov 1;104(11):5393–405.
5. Henley DV, Lipson N, Korach KS, Bloch CA. Prepubertal gynecomastia linked to lavender and tea tree oils. *New England J Med*. 2007 Feb 1;356(5):479–85.
6. Braunstein EW, Braunstein GD. Are Prepubertal Gynaecomastia and Premature Thelarche Linked to Topical Lavender and Tea Tree Oil Use? *Touch REVIEWS in Endocr*. 2023 Nov;19(2):60–8.

## BIOCHEMISTRY CORNER



### ENDOCRINE-DISRUPTING CHEMICALS IN CHILDHOOD: THE BIOCHEMISTRY BEHIND PUBERTY, THYROID FUNCTION, AND OBESITY

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

Pediatric endocrinology is traditionally conceptualized in terms of glands, hormones, and feedback loops, but a child's endocrine development is also shaped by the environment. Endocrine-disrupting chemicals (EDCs) are exogenous substances that interfere with hormone synthesis, secretion, transport, receptor binding, metabolism, or downstream signaling. Their effects are most significant during fetal life, infancy, childhood, and puberty when these endocrine pathways are still developing.<sup>1</sup>

The most clinically relevant EDCs include bisphenols, phthalates, per- and polyfluoroalkyl substances (PFAS), polychlorinated biphenyls (PCBs), pesticides and plastic-derived contaminants and air pollutants. Exposure typically begins prenatally and continues through food packaging, plastics, drinking water, personal care products, household dust, and ambient air.<sup>1,2</sup> Many mimic endogenous hormones or disrupt the molecular mechanisms needed for endocrine balance.<sup>2,3</sup> Their mechanisms are varied: receptor agonisms or antagonism at estrogen, androgen, and thyroid hormone receptors; altered steroidogenesis; impaired iodide uptake; displacement from binding proteins; and interference with gene transcription. In obesity pathways, several EDCs activate PPAR $\gamma$  and adipogenic transcription factors, driving adipocyte differentiation and lipid accumulation. Experimental studies have linked BPA with upregulation of C/EBP $\alpha$  and C/EBP $\beta$ , impaired brown adipose tissue thermogenesis, and disrupted appetite signaling. Hypothalamic inflammation has also emerged as a connecting mechanism between early EDC exposure and later reproductive or metabolic dysfunction.<sup>2,4</sup>

#### Puberty and the HPG Axis

Puberty depends on reactivation of the hypothalamic–pituitary–gonadal (HPG) axis. This process is driven by the resumption of pulsatile GnRH secretion, controlled by kisspeptin and KNDy (kisspeptin/neurokinin B/dynorphin) neurons. Obesity modifies this neuroendocrine network through leptin, adiponectin, and insulin. EDC exposure may affect the same system. Leptin is known to accelerate pubertal onset in girls by increasing Kiss1/GnRH signaling. Hyperinsulinemia may make this effect stronger. Environmental chemicals may alter pubertal timing through two mechanisms: direct endocrine disruption via receptors, and indirect effects on adipokine and metabolic signaling.<sup>3,5</sup> Mendelian randomization studies show that some PCB exposures are linked to earlier menarche, dibutyl phthalate to delayed menarche, and BPA to earlier voice break in boys. BMI mediates some of these associations.<sup>5,6</sup> These findings are associative, not causal for an individual, but match known biological mechanisms.

#### Thyroid Disruption

The thyroid axis is a well-known target of environmental contamination. Thyroid hormones control neurodevelopment, growth, metabolic rate, and tissue differentiation from early fetal life. Even minor disruptions can lead to lasting developmental issues. EDCs may interfere with sodium–iodide symporter function, hormone synthesis, deiodination, receptor binding, or thyroid feedback. Bisphenols raise particular concern because they resemble thyroid hormone analogs. Animal and in vitro studies show effects on transcription factors like Foxe1, Nkx2-1, and Pax8, as well as inhibition of sodium/iodide transport. Human studies link prenatal bisphenol exposure to changes in thyroid hormone indices in offspring. Some data suggest greater risks for girls.<sup>7</sup> Air

pollutants and fine particles are also linked to thyroid problems. Human evidence is mixed, and the mechanisms remain under investigation.<sup>8</sup>

## The Obesogen Concept and Metabolic Programming

'Obesogen' describes EDCs that cause fat gain beyond the effects of diet and exercise alone. These compounds impair insulin signaling, promote low-grade inflammation, disrupt the gut microbiome, and reduce thermogenic fat function. This mix of effects relates directly to metabolic patterns seen more and more often in pediatric endocrine clinics. Obesity often goes with insulin resistance, early puberty, and metabolic liver disease. Vulnerability does not end with current exposures; prenatal and early postnatal EDC loads can change adipocyte number and size and reset insulin–leptin balance. These changes can last long after exposure ends, setting a metabolic risk profile before a child eats solid food.<sup>3</sup>

## Epigenetic Programming: The Long Arm of Early Exposure

Epigenetic modification is a key shared molecular mechanism. DNA methylation, histone acetylation, and non-coding RNA regulation can turn a brief environmental exposure into a lasting endocrine or metabolic state. This is especially true if exposure happens during critical growth periods. This may also clarify why EDC-related endocrine effects can appear years later, and why exposures in parents may affect their children in ways not predicted by classic toxicology.<sup>1,3</sup>

## What This Means in the Pediatric Endocrine Clinic

In pediatric endocrine practice, specific exposure biomarkers—such as urinary bisphenols, phthalate metabolites, and serum PFAS are primarily research tools. They are not yet standard clinical assays. The effects of EDCs are instead measured by standard hormonal and metabolic tests. For puberty, these include LH, FSH, estradiol, testosterone, and DHEAS. For thyroid assessment, TSH, T4 (free or total), and sometimes T3 are used. For metabolic monitoring, fasting glucose, insulin, HOMA-IR, lipid profile, and ALT are measured.<sup>3,8</sup> These tests do not reveal the environmental cause, but make it possible to detect and track the resulting biochemical changes.

Awareness of EDC biology may not immediately change the tests a clinician orders. Still, it should impact how clinicians evaluate children with early puberty, unexplained thyroid tests, or a metabolic risk profile out of proportion to age and family history. The endocrine system does not develop in isolation. Instead, it is always in biochemical interplay with the environment, starting well before a child arrives at the clinic.

**Clinical Takeaway:** EDC exposure cannot be directly measured in most clinics, but its biochemical effects can be assessed. When early puberty, unexpected thyroid results, or high metabolic risk without a clear cause are present, think about environmental influences, even if you cannot always intervene.

**Table 1. Biochemical pathways and clinical markers of EDC-related endocrine effects in children**

| EDC/ Exposure                   | Key Biochemical pathway                                                   | Representative molecular/ hormonal targets                                                                   | Useful biomarkers/ tests                                                                                  | Likely pediatric endocrine effect                     |
|---------------------------------|---------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------|-------------------------------------------------------|
| <b>Bisphenols (BPA/BPS/BPF)</b> | Xenoestrogenic action; thyroid-axis interference; adipogenic signaling    | Estrogen receptors, thyroid hormone signaling, sodium–iodide transport, PPAR $\gamma$ , C/EBP $\alpha/\beta$ | Urinary BPA/BPS/BPF $\dagger$ ; TSH, fT4, fT3; fasting insulin, HOMA-IR                                   | Altered pubertal timing, thyroid dysfunction, obesity |
| <b>Phthalates</b>               | Anti-androgenic and steroidogenic disruption; metabolic signaling changes | Steroidogenic enzymes, androgen pathways, insulin signaling                                                  | Urinary phthalate metabolites $\dagger$ ; LH, FSH, estradiol/testosterone, DHEAS; fasting glucose/insulin | Pubertal variation, insulin resistance, obesity       |
| <b>PFAS</b>                     | Interference with thyroid and metabolic homeostasis                       | Thyroid hormone transport/action, lipid and glucose regulatory pathways                                      | Serum PFAS $\dagger$ ; TSH, fT4; lipid profile                                                            | Thyroid dysfunction, metabolic risk                   |

|                                     |                                                         |                                                                                 |                                                                         |                                                                |
|-------------------------------------|---------------------------------------------------------|---------------------------------------------------------------------------------|-------------------------------------------------------------------------|----------------------------------------------------------------|
| <b>PCBs / Pesticides</b>            | Persistent receptor-mediated and neuroendocrine effects | Sex steroid signaling, hypothalamic–pituitary regulation, inflammatory pathways | Serum PCB levels†; pubertal hormones where indicated; metabolic profile | Earlier or altered puberty, reproductive and metabolic effects |
| <b>Air pollutants/ Particulates</b> | Oxidative stress and inflammatory endocrine disruption  | Thyroid axis, cellular redox pathways, inflammatory mediators                   | No routine specific exposure biomarker; TSH, fT4/fT3 used clinically    | Thyroid dysfunction, broader endocrine stress                  |

† Primarily research/biomonitoring tools rather than routine clinical tests.

## References

- Andersson AM, Cianfarani S, Köhrle J, et al. EndoCompass Project: Environmental Endocrinology. *Horm Res Paediatr.* 2025;98(Suppl 2):163–186.
- Ojo AB, Agbeye OD, Ogwa TO, et al. Implications of plastic-derived endocrine disruptors on human health. *Toxicol Mech Methods.* 2025;35(8):894–918.
- Kapama A, Stefanaki C, Mastorakos G, Papagianni M. The Role of Endocrine Disruptors in Childhood Obesity: Unraveling the Obesogens. *Horm Res Paediatr.* 2026;99:194–207.
- Stathori G, Hatziaepiou K, Mastorakos G, et al. Endocrine-Disrupting Chemicals, Hypothalamic Inflammation and Reproductive Outcomes: A Review of the Literature. *Int J Mol Sci.* 2024;25:11344.
- Kythreotis AK, Nicolaou M, Mitsinga E, et al. The Interplay Between Body Weight and the Onset of Puberty. *Children (Basel).* 2025;12:679.
- Zuo M, Gamache I, Fagbemi K, Day FR, Ong KK, Manousaki D. The causal role of endocrine disrupting chemicals in pubertal timing: a Mendelian randomization study. *J Pediatr Endocrinol Metab.* 2025;38(7):753–760.
- Liu J, Tian M, Qin H, et al. Maternal bisphenols exposure and thyroid function in children: a systematic review and meta-analysis. *Front Endocrinol (Lausanne).* 2024;15:1420540.
- Street ME, Shulhai AM, Petraroli M, et al. The impact of environmental factors and contaminants on thyroid function and disease from fetal to adult life: current evidence and future directions. *Front Endocrinol (Lausanne).* 2024;15:1429884.

## PEDSENDOSCAN

**Aashima Dabas**, Dept of Pediatrics, Maulana Azad Medical College & Lok Nayak Hospital, New Delhi



**D'Aleo E, Lastretti M, Scarparo T, et al. Intermittent Fasting and Emotional Regulation: A Psychobiological Framework Integrating Metabolic, Neuroendocrine and Interoceptive Mechanisms. *Nutrients.* 2026 May 20;18(10):1626. doi: 10.3390/nu18101626.**

A narrative search was conducted for studies between 2010 and 2025 across the electronic databases PubMed/MEDLINE, Scopus, and Google Scholar, for the effect of intermittent fasting on metabolic and neuroendocrine system. Fasting induces ketogenesis, that affects cognitive and affective functioning by the upregulation of brain-derived neurotrophic factor. This factor is related to synaptic plasticity. Fasting also affects the gut microbiota and improves mitochondrial function. The effect of intermittent fasting showed short term elevation in cortisol levels, suggestive of metabolic adaptation. Insulin resistance reduces, with lowered levels of leptin and elevation in ghrelin. The review however, highlighted the limitations in this inference which was based on short term follow-up data and associated bidirectional psychosocial impact of fasting, governed by individual factors like age, metabolic status, physical activity and psychosocial vulnerability.

**Arvais O, Raymond C, Mahhou MA, et al. Trauma exposure, perceived stress and morning cortisol levels among Palestinian boys in the Gaza Strip and West Bank. *Psychoneuroendocrinology.* 2026 Jun;188:107850. doi: 10.1016/j.psychneu.2026.107850. Epub 2026 Apr 7.**

Adverse environmental stressors like war, conflict and violence act as psychosocial stressors during childhood development. Each adverse stressor can manifest with physiological consequences that adversely affect the hypothalamic pituitary axis (HPA). This study was conducted in boys age 9-11 years living in West Bank or Gaza district of war affected zones of Palestine. All participants filled their trauma exposure using Exposure to Potentially Traumatic Events Scale (EPTES), a measure specifically developed and validated for Palestinian children, and the Perceived Stress Scale. Morning salivary cortisol at baseline and after 30 minutes of awakening, over three days was measured. There was a wide heterogeneity in the cortisol concentrations, suggestive of biological variability in children living under extreme conditions. The morning salivary cortisol levels showed a positive correlation with Trauma perceived effect ( $r=0.31$ ,  $R^2=0.10$ , 95% CI [0.02, 0.55],  $p=.037$ ,  $n=45$ ) in West Bank. The variation in the cortisol levels ranging from elevation to attenuation also suggest bidirectional response and plasticity of the HPA.

van Larebeke N, Cox B, Remy S, et al. Per- and polyfluoroalkyl substances (PFAS), thyroid hormones, sexual hormones and pubertal development in adolescents residing in the neighborhood of a 3M factory. *Environ Health.* 2025 Jun 7;24(1):34. doi: 10.1186/s12940-025-01188-1.

Per- and polyfluoroalkyl substances (PFAS) are used in non-stick cookware, fire-fighting foams etc. because they have unique properties to fight oil, flame and stains; they are also 'forever chemicals' that bioaccumulate with time. This study evaluated the effect of PFAS exposure in adolescents living within a 5 km radius of an industrial zone. A total of 21 PFAS compounds were measured and quantified using UPLC-MS/MS method in 146 girls and 139 boys. Different PFAS showed an association in terms of delayed pubertal onset in both genders; and higher SHBG concentration with lower sex steroid levels in boys. The levels of PFAS showed a negative association with pubertal development for age in girls. The PFAS levels also showed an association with delay in growth spurt (both genders) and shorter length of growth spurt in girls. The levels of free T3 were higher with lower TSH in boys as per exposure. The results of this study indicate the need for continued surveillance of the impact of environmental exposures on growth.

## LISTENING TO THE STALWARTS

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



### Dr Sudha Rao



Rooted in a culturally diverse upbringing that naturally sharpened her patient rapport, her journey in pediatric endocrinology beautifully underscores the profound impact of mentorship—from early family role models to pioneering figures like Dr. Mina Desai. Her transition from grassroots healthcare to advanced specialization fostered a deep clinical and social empathy, guiding her active role in shaping the field's evolution through benchmark fellowship programs that have elevated academic standards across India. Ultimately, her experiences offer a graceful blueprint for the all young and upcoming pediatric endocrinologists: by anchoring themselves in strong foundational knowledge and utilizing technology with disciplined boundaries to prevent burnout, the next generation can champion a promising future driven by multidisciplinary care, indigenous innovation, and a lifelong dedication to reciprocal learning.

We are grateful for Dr Sudha Rao to share her insights in a graceful manner. Thank you, madam.

YouTube link- <https://youtu.be/1p2ylbkrdjQ>

## PEP (FEBRUARY 2026)- NUTRITIONAL & NON-NUTRITIONAL OBESITY

**Vijay Jaiswal**, Professor, GMC, Saharanpur.



The Pediatric Endocrinology for Postgraduates (PEP) session under the auspices of ISPAE was conducted on 20<sup>th</sup> May 2026, under the mentorship of Prof Raghupathy, Dr Anurag Bajpai and Dr Vijay Jaiswal, with Dr Jaivinder Yadav as PEP coordinator. Nutritional obesity was discussed by Dr Riya Shah, Endocrine Fellow in Regency Hospital, Kanpur, under the guidance of Dr Anurag Bajpai, with examiner Dr Aashima Dabas. Syndromic obesity was discussed by Dr Saumya, DNB student at Manipal Hospital, Bengaluru, under the guidance of Dr Shamkiran, with examiner Dr Kavitha Bhat, Manipal Hospital, Bengaluru. A few salient points:

- \*\* Childhood obesity is rising rapidly due to multiple reasons, related to lifestyle, environmental and genetic factors.
- \*\* Traditionally age- and gender-specific body mass index (BMI) cut-offs are used to diagnose childhood obesity. Children above the 85<sup>th</sup> percentile are labelled overweight, and those above the 95<sup>th</sup> percentile as obese, based on gender-specific BMI data sets.
- \*\* The 2015 Indian Academy for Pediatric (IAP) BMI charts have been derived based on the lower adult BMI cut-offs recommended for adult Indians, backtracking for overweight 23 kg/m<sup>2</sup> and obese 25 kg/m<sup>2</sup>.
- \*\* Many prevalence studies in India have also utilized the International Obesity Taskforce (IOTF) data set and the American Centers for Disease control (CDC) age- and gender-specific data set.

- \*\* Pooled data from 21 studies suggested an overall prevalence of obesity in childhood to be around 8.4%, and of overweight to be around 12.4%.
- \*\* To tackle the prevalence of childhood obesity, a multifaceted approach is required, involving government, health care professionals, educators, parents, and the food industry.
- \*\* This includes implementing nutrition education programs in schools, promoting breastfeeding and healthy eating practices from an early age, creating safe and accessible spaces for physical activity, and regulating the marketing of unhealthy foods to children.
- \*\* Obesity with very early onset in infancy, or co-associated with developmental delay, should be thoroughly investigated for syndromic and monogenic obesity.

## REPORT: IDEAL & BEST PROGRAMS

### IDEAL & BEST PROGRAMS - ACTIVITY REPORT (APRIL–JUNE 2026)

**Preeti Singh**, Professor, Lady Hardinge Medical College & Kalawati Saran Children's Hospital, New Delhi & **Anju Virmani**, Director, Pediatric Endocrinology, Max Smart Super Specialty Hospital, New Delhi



ISPAE's Type 1 Diabetes programs – IDEAL (Ispace Diabetes Education And Learning) and BEST (Basic Education Series in T1D) - continue to become stronger, and reach further. The **11<sup>th</sup> Batch of IDEAL** began with the Orientation session on 16<sup>th</sup> Jan and after 17 teaching modules, 8 feedback session and 2 additional revision sessions, wound up with the Exit Exam in the last week of May. Of the 31 trainees, 25 cleared the exam successfully, becoming Certified Pediatric Diabetes Educators and joining the IDEALite WhatsApp group. We are proud to say that there were 10 distinctions among them.

The strength of the vibrant **IDEALite WhatsApp group** now stands at 328 members, with constant interaction – learning, sharing, networking. Some glimpses of how active IDEALites are can be had in the numerous activities featured in the **IDEAL Corner** later in this issue. Our other off-shoot activities also continue to move forward with consistency and determination. Dr Pallavi Yadav has taken over the responsibility of extending our visibility on various social media platforms to maintain program visibility and outreach.

Our **MMM – Monthly Myth-busting Message – Series**, released every month, clears the air about different myths, on a topical basis. IDEALite Ms Savita Agarwal has been translating these posters into Hindi to extend their reach. The **OPDE – Ongoing Pediatric Diabetes Education - sessions** to refresh IDEALites are held every alternate month. The April 2026 session by Dr Pallavi Yadav has been covered in IDEAL Corner. The next session scheduled for 5<sup>th</sup> July, with Dr Shuchy Chugh and Mr Harsh Kohli discussing the need to have ketone testing in every T1D household will be extended to the Community as well. At the beginning of every school term, and for all newly diagnosed children and adolescents, we continue to encourage sharing of the **IDEAS videos** for school staff. They are available in English, Hindi, Bengali, Gujarati, Kannada, Tamil and Telegu; there is even a video in Hinglish!

A new initiative, charting unknown seas, is the **IDEAL-NEXT** (North East eXcellence in T1D) program! Through the four Sundays of June, we are conducting online sessions to sensitize Residents and Fellows (Pediatrics, Medicine, Diabetology) about basic T1D care. We have received much-cherished support and encouragement from Prof Jaya Shankar Kaushik, HOD Pediatrics, AIIMS Guwahati, and the kind involvement of \* Dr Manab Narayan Baruah, HoD Dept of Pediatrics, Jorhat Medical College, Jorhat; \* Dr Arpita Gogoi, HoD, Assam Medical College, Dibrugarh, \* Dr Ashok Krishna Bhuyan, HOD, Dept of Endocrinology, Guwahati Medical College, Guwahati, \* Dr Bipul Kumar Das, Asst Prof, Pediatrics, AIIMS, Guwahati, \* Dr Dulal Kalita, HoD, Pediatrics, Guwahati Medical College, Guwahati, \* Dr Kumud Pathak, HoD, Tezpur Medical College, Tezpur, \* Dr Partha P Bora, HOD, Dept of Pediatrics, Rainbow Pratiksha Hospital, Guwahati, \* Dr Sujit Nath Chowdhury, HOD Pediatrics, Silchar Medical College, Silchar, and especially of Dr Salam Ranabir, HOD Endocrinology, RIMS, Imphal.

The **12<sup>th</sup> Batch of IDEAL** is scheduled to commence in July 2026. This batch is for physicians, who will be able to set up or strengthen Pediatric & Adolescent Diabetes Clinics in their areas. Applications have been invited, and the process of selection for admission is in progress. Several applications have been received, and as the faculty groups brush up our teaching content, we are looking forward to training and interacting over the coming months.

The **12<sup>th</sup> Batch of BEST** was conducted from 5<sup>th</sup> to 26<sup>th</sup> May, and successfully trained 27 participants from across the country, taking the total number trained through BEST to nearly 400 till date. The batch had rich and diverse participation, including parents and young persons with T1D. The live, interactive sessions were well received, with encouraging feedback and a strong suggestion to make such programs available to all persons living with or associated with T1D. The next batch is planned for August–September 2026.

We are excitedly looking forward to meeting in **Ahmedabad in October**, during the **ISPAE 2026 meeting**. The **Basic Workshop** is being conducted with a group of IDEALite PDEs, and is tailored to meet the needs of the PDEs – learning or refreshing hands-on skills, getting acquainted in person, networking, and forging relationships for the future. We are sure IDEALites will make the meeting a resounding by registering in large numbers, and submitting abstracts detailing their work.

Our programs and activities demonstrate consistent growth and outreach, which is reflected in the interest taken by medical and T1D communities. It is gratifying to see the positive impact in T1D care as a result of our hard work.

## ACTIVITIES BY ISPAE MEMBERS

### PEDIATRIC ENDOCRINE ESSENTIALS

*Nikhil Lohiya, Senior Consultant Pediatric Endocrinologist, Silver Lining Pediatric Super Specialty Center, Nagpur*



**Pediatric Endocrine Essentials** - a comprehensive workshop dedicated to the fundamental and advancing aspects of pediatric endocrinology, conducted on 10<sup>th</sup> of May 2026, was organized by the Silver Lining Pediatric Foundation, in collaboration with ISPAE, and Datta Meghe Medical College, Nagpur. The meeting, attended by 55 delegates, was well received. The distinguished faculty included Dr Vaman Khadilkar, Dr Hemchand Prasad, Dr Nikhil Shah, Dr Chirantap Oza, Dr Nikhil

Lohiya, Dr Anshika Singh, Dr Hari Mangtani and Dr Swati Dokania. The event was sponsored by multiple pharma companies including Pfizer, Novo Nordisk & Sun Pharma.

## ACTIVITIES AT THE KARNATAKA INSTITUTE OF ENDOCRINOLOGY AND RESEARCH (KIER)

*Shruthi R & Cynthiyal T, KIER*

### A heartwarming thanksgiving with Shahi Exports

We were honored to host a special thanksgiving event for Shahi Exports, our generous sponsors who are making a profound difference in the lives of children living with Type 1 diabetes (T1D). Shahi Exports has been providing insulin, glucose strips and needles for 100 kids at KIER, ensuring these young warriors have the essential supplies they need to manage their condition effectively and lead healthy, happy lives.

About 40 children and their parents attended the event, coming together to share stories and receive much-needed insulin supplies. Seeing the warmth, gratitude, and smiles of children and their families reminded all of us of the strength that comes from care, support, and compassion.

We extend our deepest thanks to Shahi Exports for their unwavering commitment and generosity. Through their support, we are not only addressing a critical health need, but also creating moments of joy, hope, and reassurance for families navigating the challenges of Type 1 diabetes.



### AMETEK THANKSGIVING PROGRAM

On 30th April 2026, the Uthishta Foundation organized a heartfelt Thanksgiving program to express gratitude towards Ametek for their invaluable contribution in supporting children with T1D. Ametek has been consistently supporting Uthishta's cause by donating analog insulin, insulin needles, glucometers, and blood glucose test strips to children receiving treatment at KIER. Their generous support of approximately ₹53 lakh, has enabled 150 children to receive essential diabetes care for one year.

The dignitaries representing Ametek at the event were Mr Sadanand Patil and Mr Krishna Jayaraman. Many parents took the opportunity to share their heartfelt gratitude, highlighting how this support has significantly improved their families' quality of life and reduced the economic burden of managing diabetes. The program concluded with an inspiring announcement from Mr Patil, who assured that Ametek would extend its assistance to 150-300 children in the coming year, which was met with immense joy and appreciation from the parents. Following the formal proceedings, children were divided into age groups for interactive activities. The younger children enthusiastically participated in art and craft sessions conducted by Ametek staff, while the older children attended a career counselling session. The event ended with a communal lunch, creating a warm atmosphere of encouragement, gratitude, and hope for the future of children living with T1D.



## RADIO SAMVAD 98.3 FM RADIO MIRCHI: THYROID MYTHS & FACTS: LET'S TALK THYROID (A PUBLIC AWARENESS INITIATIVE)

*Hemant Phatale & Priti Phatale, Aurangabad*

To raise public awareness about thyroid disorders, their early identification, and to prevent their long-term health consequences.

### The Critical Role of Thyroid Health: From Neonatal Screening to wellness

Congenital hypothyroidism (CH) is a condition in which a baby is born with an absent, underdeveloped, or poorly functioning thyroid gland. Thyroid hormones are critical for brain maturation during the first few years of life. If left untreated, CH can lead to irreversible intellectual disability, poor growth, developmental delays, and hearing impairment. CH is the commonest preventable causes of intellectual disability, affecting approximately 1 in 2,000–3,000 newborns worldwide. TSH screening shortly after birth allows for a timely diagnosis & immediate intervention to prevent permanent intellectual disability.

### Is Thyroid Disorder Responsible for every weight gain?

It is a common misconception that every weight gain is attributable to a thyroid disorder. Thyroid evaluation should be considered only when weight gain is accompanied by poor height gain or growth failure in children, excessive fatigue & sluggishness, persistent constipation, cold intolerance, dry skin, pubertal problems, declining academic performance. In such situations, thyroid function testing can help identify underlying hypothyroidism and guide appropriate treatment.

### Thyroid Disorders and Pregnancy

Women with hypothyroidism may experience irregular menstrual cycles, difficulty in conceiving, recurrent miscarriages, infertility & pregnancy complications. Women with these symptoms should undergo thyroid evaluation, enabling early diagnosis and appropriate management, which not only improve maternal health, but also support healthy fetal growth and neurodevelopment.

## EMPOWERING CHILDREN WITH TYPE 1 DIABETES

*Dhanya Soodhana, Pediatric and Adolescent Endocrinologist, Aster MIMS, Kozhikode*



We are happy and grateful to share that Aster Volunteers and Aster MIMS Charitable Trust, with Aster MIMS Calicut, successfully distributed 250 Continuous Glucose Monitoring (CGM) devices to children with T1D under the Aster MIMS CSR Initiative. The program, presided over by the District Collector, Mr Snehil Kumar, had about 130 children and their parents participating, making it a meaningful step towards better diabetes care. Members of the T1D Welfare Society were actively involved in its success. Awareness sessions were conducted by Dr Suresh Kumar (HOD Pediatrics) and Dr Dhanya Soodhana (Pediatric and Adolescent Endocrinologist).

## SWEET SPROUTS T1D ONLINE CONNECT 2026

*Swathi Padmanaban, Consultant Pediatric Endocrinologist, Rainbow Children's Hospital, Chennai*



As part of ongoing efforts to support children with T1D and their families, Dr Swathi Padmanaban conducted an educational support session - Sweet Sprouts T1D Online Connect 2026. It focused on empowering families, particularly those navigating a recent diagnosis, through practical diabetes education. Topics covered included \* understanding T1D, \* insulin administration, \* blood glucose monitoring, \* nutrition and \* lifestyle management, \* recognition and management of hypoglycemia and hyperglycemia, and \* introduction to Continuous Glucose Monitoring (CGM) technology. Ms Rogini

Arunindrakumar, Certified Diabetes Educator and Executive Committee Member of the Tamil Nadu Type 1 Foundation, Chennai, shared valuable practical insights on living with and managing T1D. The interactive session provided parents with an opportunity to discuss challenges, clarify doubts, and learn from shared experiences, while reinforcing the importance of structured diabetes education and peer support in improving confidence and self-management among T1D families. Sweet Sprouts has been envisioned as an ongoing support platform, with online educational sessions planned every six months and an annual in-person gathering to foster learning, peer interaction, and community engagement.



LLRM Medical College, Meerut, in collaboration with Obgyn and Pediatrics depts. Dr Vijay Jaiswal, Meerut



Under IAP, NNF Meerut, & State Health Dept, attended by 100 delegates. NNF Secretary-General Dr Amit Upadhyay, Past Secretary-General, Dr Vineet Saxena, and CMO Meerut, Dr Vijay Jaiswal, Meerut.



Thyroid Day celebration at Govt Medical College, Saharanpur with Depts of Pediatrics & Obgyn: attended by postgraduates, faculty and nurses. Dr Vijay Jaiswal



Wide media coverage on electronic and print media as well as social media platform. Dr Vijay Jaiswal, Meerut

## IDEAL CORNER

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

### INDIRA GANDHI INSTITUTE OF CHILD HEALTH, BENGALURU, HOSTS BLUE DREAMS SUMMER CAMP 2026 FOR CHILDREN WITH T1D | 4 APRIL 2026

The **Blue Dreams Summer Camp 2026** for children living with T1D was successfully organized by **IGICH** on 4 April 2026 amidst the serene surroundings of Ramakrishna Mission School, Bengaluru. The day commenced with registration at IGICH, followed by a group journey to the venue, fostering a sense of camaraderie among children, parents, healthcare professionals, and staff.

The camp featured a variety of recreational activities, interactive games, and group sessions that encouraged participation, confidence, and peer bonding. A major highlight was the interaction with T1D advocates, including a national-level tennis player living with T1D, who shared personal experiences of overcoming challenges and achieving success. These sessions provided inspiration, practical insights, and an opportunity for children and parents to ask questions and gain confidence in managing diabetes. It concluded with dance and group activities, creating an atmosphere of joy, learning, and mutual support. The event offered a valuable platform for education, empowerment, and community building for children with T1D and their families. Nutritious snacks and meals were provided throughout the day.



### OPDE SESSION HIGHLIGHTS IMPORTANCE OF FIRST AID AND BASIC LIFE SUPPORT: ONLINE | 5 APRIL 2026

As part of the **Ongoing Pediatric Diabetes Education (OPDE)** series, an educational session on “**First Aid and Basic Life Support (BLS)**” was conducted for IDEALites on 5 April 2026. It was delivered by **Dr Pallavi Yadav**, American Heart Association International Faculty for BLS, ACLS, and PALS, who shared practical knowledge on responding to life-threatening emergencies.

#### Key highlights included:

- Principles and importance of Basic Life Support (BLS).
- Early recognition and response to cardiac arrest.
- Essential first aid measures during medical emergencies.
- Managing airway obstruction and respiratory emergencies.
- The importance of timely intervention before advanced medical help arrives.

The session emphasized that emergencies can occur anytime and anywhere, and equipping healthcare professionals with basic life-saving skills can make a critical difference in patient outcomes.

### MANAGING THE EMOTIONAL WAVES OF T1D: EXPERTS DISCUSS MENTAL WELL-BEING & RESILIENCE ONLINE | 8 APRIL 2026

**JDF Mumbai** organized an insightful online session on “**Managing the Emotional Waves of T1D**”, highlighting the often-overlooked psychological aspects of living with T1D. The session featured **Dr Manoj Bhatwadekar**, a renowned psychiatrist and long-time supporter of the T1D community, and was hosted by IDEALite **Ms Vaishali Vakil**, Counselor, Certified Diabetes Educator, and T1D advocate.

## Key highlights included:

- Understanding the emotional highs and lows associated with living with T1D.
- Recognizing and overcoming diabetes burnout.
- Exploring the connection between mental well-being and T1D management.
- Practical strategies for building emotional resilience and long-term coping skills.
- Insights from both clinical psychiatry and lived experience within the T1D community.



The interactive session emphasized that effective T1D management extends beyond glucose levels, underscoring the importance of emotional health, peer support, and resilience in living well with T1D.

## UDAI ANNUAL HEALTH CAMP STRENGTHENS SUPPORT FOR CHILDREN WITH T1D UTTARAKHAND | 12 APRIL 2026

**DAI - Diabetes Awareness Initiative Society** successfully organized its **Annual Health Camp** on 12 April 2026, bringing together children with T1D and their families from Gairsain, Rudrapur, Dehradun, Tehri, Saharanpur, Haridwar, and nearby regions.

### Highlights:

- The camp was chaired by **Smt Radha Raturi**, former Chief Secretary of Uttarakhand, and graced by **Shri Anil Raturi**, former DGP of Uttarakhand.
- Shri Raturi motivated children by sharing examples of renowned personalities, emphasizing that T1D does not limit one's ability to achieve success.
- Smt Raturi appreciated the efforts of UDAI founder **Ms Rekha Negi (IDEALite)**, recognizing her dedication to supporting the T1D community.
- The focus was on both diabetes management and emotional well-being, addressing the challenges faced by children and their families.
- **Dr Srishti Puri**, a psychologist with over a decade of experience, conducted counseling sessions to help families build emotional resilience.
- Healthcare professionals including **Dr Ashish Sethi** and **Dr Ananya Sati** were also present and interacted with participants.
- Children monitored blood glucose levels, administered insulin, and shared meals together, promoting confidence, independence, and peer support.
- The camp served as a platform for education, inspiration, and community bonding, empowering children to move forward with confidence.



Through such initiatives, UDAI continues to strengthen support for children living with T1D and their families.

## JDF MUMBAI HOSTS “NAVIGATING PREGNANCY WITH TYPE 1 DIABETES” ONLINE SESSION ONLINE | 22 APRIL 2026

Women with T1D and their families came together for an insightful online discussion focused on pregnancy planning, glucose management, and mother-hood while living with T1D. The session featured **Dr Anushree Mehta**, who shared expert medical guidance, and **Ms Henna Desai**, a T1D warrior and mother of two, who offered practical insights from her personal journey.



### Key highlights included:

- Expert advice on T1D management before, during, and after pregnancy.
- Personal experiences from a mother who has successfully navigated pregnancies with T1D.
- Practical tips, encouragement, and support for women planning pregnancy or motherhood.

The session reinforced the fact that with proper planning, medical care, and self-management, women with T1D can achieve healthy pregnancies and successful motherhood.

## RIO SWEET KIDS MEET CREATES HOPE AND SWEET MEMORIES FOR T1D FAMILIES MADURAI, TAMIL NADU | 10 MAY 2026

A special gathering was organized by **Rio Hospital** at **Narayana School, Madurai**, bringing together 15 children with T1D and their families for a day of learning, support, and fun-filled activities.

### Highlights of the program:

- Fun games and activities brought smiles and happiness for the kids.
- Parents gained awareness about the latest advances in T1D care, including insulin pumps, AI-based smart pumps, & available support systems.
- Educational sessions were conducted by **Dr Krishna Swaminathan** (Endocrinologist) and **Dr RM Dinesh Babu** (IDEALite), focusing on practical diabetes management and emerging technologies.
- Practical dietary guidance was shared to support healthy living with T1D.
- With the support of the **Idhayangal Trust** Team, families with financial constraints received guidance on accessing free insulin pens, glucometers, and CGM devices.
- Families were encouraged by success stories of individuals living well with T1D, highlighting the importance of discipline, confidence, and community support.
- The event reinforced a powerful message: **"No lock is ever made without a key"**—every challenge comes with hope and support.



The program provided a valuable platform for learning, encouragement, and connection among children with T1D and their families.

## PEER SUPPORT GROUP MEETING EMPOWERS CHILDREN WITH T1D THANJAVUR | 24 MAY 2026

Dr. Mohan's Diabetes Specialties' Center, Thanjavur, organized a Peer Support Group Meeting for children with T1D and their families, to promote diabetes awareness and self-management. Expert sessions were delivered by **Dr N Mohan Das**, Senior Consultant Nephrologist, and **Dr Killivalavan**, Senior Consultant Diabetologist, focusing on diabetes care and healthy living. **Mr Aravindh**, Senior Dietitian and Diabetes Educator, Chennai, conducted interactive sessions on carbohydrate counting, Ambulatory Glucose Profile (AGP) interpretation, and insulin injection site rotation. Experience-sharing, practical demonstrations, and educational exhibits further enhanced learning, leaving participants and their families better informed and empowered to manage T1D effectively.



## JDF SUMMER CAMP EMPOWERS T1D FAMILIES THROUGH EDUCATION AND COMMUNITY SUPPORT 7 JUNE 2026

The **Juvenile Diabetes Foundation (JDF)** successfully organized its annual **Summer Camp** on Sunday, 7 June 2026, bringing together a vibrant community of over 150 individuals living with T1D and their family members. Designed as an intensive, single-day educational and bonding retreat, the event provided a comprehensive platform for clinical learning, psychosocial support, and peer-to-peer connection.

The camp was privileged to have the expertise of an esteemed multidisciplinary faculty comprising:

- Dr Aspi Irani
- Dr Manoj Bhatwadekar
- Dr Anjali Bhatwadekar
- Dr Shachindra Joshi
- Dr Anushree Mehta
- Mr Vipul Mehta, Certified Diabetes Educator
- Ms Vaishali Vakil, Counselor & Certified Diabetes Educator



**Comprehensive Medical and Behavioral Insights:** The core of the camp focused on holistic diabetes management, featuring specialized sessions tailored to the daily realities of those living with T1D.

**Advanced Pediatric and Adolescent Care:** Faculty members led discussions on optimizing insulin regimens, understanding glycemic variability, and preventing long-term complications.

**The Psychology of Diabetes Management:** Expert insights focused on the psychological aspects of living with a chronic condition, highlighting behavioral strategies to manage diabetes burnout, improve treatment adherence, and foster family resilience.

**Interactive Q&A Forum:** The expert faculty participated in an open panel discussion, addressing practical challenges faced by individuals with T1D and their caregivers, including school-hour management, sick-day care, and emerging diabetes technologies.

**Fostering a Supportive Ecosystem:** Beyond clinical education, the JDF Summer Camp served as an essential support ecosystem. While parents and caregivers engaged with the faculty to deepen their understanding of diabetes management, children and young adults participated in peer interactions that reinforced a critical message—they are not alone in their journey.

By bridging the gap between clinical expertise and community living, the JDF Summer Camp continues to be a cornerstone initiative in improving the quality of life and healthcare outcomes for the T1D community.

## HARMONY HEALTH SPECIALTY CLINIC HOSTS T1D CHAMPION PROGRAM NASHIK | 14 JUNE 2026

A gathering of about 150 individuals with T1D and their families came together at **Gurudakshina Auditorium, Nashik**, for the **T1D Champion Program** organized by **Harmony Health Specialty Clinic, Nashik**.

The event recognized T1D achievers for their academic and extracurricular accomplishments, along with **HbA1c Warriors** who have consistently maintained HbA1c levels below 7.5%. Special honors were also bestowed upon women with T1D who successfully managed their diabetes through pregnancy and motherhood. The program included educational sessions by:

- **Dr Tushar Godbole** on the role of technology in T1D management.
- **Ms Ketaki Pujare** (Dietician) on carbohydrate counting and healthy eating.

The event brought together families for a day of recognition, learning, and community support, celebrating the achievements of individuals living successfully with T1D.



## TEEN DIABUDDIES CONNECT AT COFFEE MEET IN JALGAON DURGA CAFÉ, JALGAON | 14 JUNE 2026

A Coffee Meet exclusively for teenage “Diabuddies” was organized by **Club One Adda** in association with **Hormocare Clinic** on 14 June 2026 at Durga Café, Jalgaon. The initiative provided a unique platform for adolescents living with T1D to connect, share experiences, and strengthen peer support networks.

### Key highlights of the event included:

- An interactive educational session led by **Dr Ajinkya Patil**, Pediatric Endocrinologist.
- Discussions on T1D management, including lifestyle, nutrition, and coping with the challenges of adolescence.
- Opportunities for participants to interact openly and learn from shared experiences.
- Engaging games and fun activities conducted by young volunteers and IDEALite members.
- A supportive environment that encouraged friendship, confidence, and community bonding.



The event successfully blended education, interaction, and recreation, creating a meaningful and memorable experience for all participants. By fostering peer connections and promoting practical diabetes self-management skills, the Coffee Meet reinforced the value of community-driven initiatives for teenagers living with T1D.

## WISH-GRANTING EVENT AT KIER | 20 JUNE 2026

*Santhosh Olety, Pediatric Endocrinologist, KIER*

KIER hosted a heartwarming wish-granting event proudly supported by the Make-A-Wish Foundation, dedicated to bringing joy and successfully turning the personal dreams of 45 brave, resilient children living with T1D into reality, by bringing them a variety of eagerly anticipated gifts tailored to their dreams, including:



\* Bicycles, \* Laptops, \*Notepads/Tablets, \* Smartphones, \* Sports equipment like Cricket kits and Badminton rackets. Our CAO **Ms Soujanya** graced the occasion and distributed the wishes.



The day was made even more memorable by a special gesture from the undergraduate Computer Science students of SRMC College, Chennai. These dedicated student volunteers went above and beyond, organizing and guiding the children through a series of highly engaging team activities. Their energy and enthusiasm created a joyful, interactive environment that left the kids smiling all day long.

## YOG DHYAN FOUNDATION (YDF), NEW DELHI: QUARTERLY REPORT: APRIL-JUNE 2026

*Anil Kumar Vedwal, Chief Functionary, YDF*

### MAJOR MILESTONES

□ **New Support Center Launched in Gurgaon:** We are thrilled to announce the opening of a brand new Educational and Essential Support Clinical Center in Gurgaon! Established in professional collaboration with Faith Clinic, the center operates under the expert supervision of Dr Sunita Manchanda at the premises of Arya Bal Kalyan Kendra, Gurgaon. This crucial expansion allows us to bring vital T1D resources, diagnostics, and structured clinical support closer to our families across the NCR region.

□ **Upgrading Our Education: Interactive Digital Board:** Learning just got significantly more interactive and visually rich at the main YDF Center, with Sachin Academy generously donating, in May 2026, a state-of-the-art Digital Board dedicated exclusively to our healthcare and educational workshops during camps. This modern tool is already transforming how we teach children and parents about intricate diabetes management mechanics, insulin tracking, and lifestyle habits.

**Our monthly activities:** we continue physical, bi-monthly on-site camps combining clinical monitoring, wellness through yoga, medical education, and community celebrations at the YDF Center, New Delhi, and monthly online education “Look One Virtual Event” series, which are organized and conducted smoothly by Dr Anil Vedwal, Ms Amrita Rupani, Ms Himani, and Ms Sayma. The monthly session recordings are available on the YDF YouTube channel, and well worth listening to.

**April 2026:** A **Comprehensive Dental Screening & Care** specialty camp on **5<sup>th</sup> April** focused on oral hygiene awareness and preventive dental routines for children living with T1D. On **12<sup>th</sup> April**, the monthly session honored **Hero of the Month Ms Pooja Hurkat**, who deeply inspired families by sharing her personal journey of unwavering resilience and positivity while thriving with T1D; and focused on “Online Resources for Diabetes Education: What to Trust” with guidance by **Dr Bhanu K Bhakri** (Pediatric Endocrinologist), **Dr Amruta Sathe** (Pediatric Endocrinologist), **Mr Harsh Kohli** (IDEALite & T1D Educator), and **Mr Sam Gulati** (IDEALite & T1D Product Manager). A **Free HbA1c Camp** was held on **19<sup>th</sup> April**, with Dr Lal PathLabs providing A1c test to 100 children on a first-come, first-served basis.



**May 2026:** A **Triple Care Screening Camp (HbA1c, TSH & Dental)** on **3<sup>rd</sup> May** with tests by Dr Lal PathLabs and a preventive dental checkup, also had yoga, the May birthday cake, and nutritious lunch. On **10<sup>th</sup> May**, **Hero of the Month Mr Praveen Sachdeva** (T1D - SPAD) energized us all with his incredible travel adventures, underlining the theme “Travel

Without Fear: T1D is Not a Barrier”. The Expert Keynote talk by **Prof Preeti Singh** (Pediatric Endocrinologist, IDEAL faculty), and panel discussion by **Ms Geeta Rani** (T1D Mom), **Dr Shruti Arora** (IDEALite, Ayurveda Doctor & Educator), and **Ms Mohita Roy** (T1D, Corporate Professional) focused on dispelling anxiety and giving families the confidence to travel safely. **17<sup>th</sup> May** had a **T1D Empowerment & Kit Monitoring Workshop**, focusing on active self-monitoring, learning actionable logging techniques, problem-solving skills, and stress-relieving yoga practices.

**June 2026:** Preparations for Summer Vacation were combined with Growth Tracking on **7<sup>th</sup> June**, with **Mr Harsh Kohli** discussing “Managing T1D During Summer Vacation and Preventing Hypoglycemia,” while **Dr Anil Vedwal** discussed “Comparing HbA1c with Logbook Data”. The **14<sup>th</sup> June** online session continued this theme “Beat the Heat: Smart Ways to Stay Safe in Summer” by honoring **Hero** and Keynote speaker **Dr Sanket Pendsey** (Diabetologist & In-charge, Dream Trust, Nagpur), who described the incredibly comprehensive support activities of the Dream Trust for poor families, and explained their pivotal study on effect of temperature on insulin. The Panel of **Ms Chhavi Kohli** (Dietician, Diabetes Educator, IDEAL faculty) and **Mr Lakshminarayana Varimadugu** (IDEALite, Diabetes Educator & Software Professional) were joined by Dr Anju Virmani on further tips to handle the heat successfully. “International Yoga Day” on **21<sup>st</sup> June** celebrated the courage and resilience of all T1D heroes and their brave families. On this occasion, we extend our deep gratitude to our visionary YDF Trustees, Mr Rummy Chhabra and Ms Bindia Chhabra, under whose stewardship YDF takes every opportunity to fulfil its aim of giving “an opportunity – *ek mauka*- to every child with T1D”. Our sincere thanks also to all medical experts, hospitals, passionate volunteers, community families, and generous institutional donors, including Dr Anju Virmani (Pediatric Endocrinologist), the Sachin Academy, Rotary Southend and Southend Next, The Bigger Picture, Lotus Foundation, and Idhayangal Charitable Trust. Together, we step forward with collective strength!

## T1D PARENTING CIRCLE & T1DAWARE INDIA: INITIAL IMPACT SUMMARY (OCTOBER 2025 – JUNE 2026)

*Japinder Gill, Certified Diabetes Educator, IDEAL Batch 11*

**T1D Parenting Circle** was started in October 2025 with the intention of creating a safe learning and support ecosystem for families living with T1D. The initiative combines Diabetes Education with Parent support, aiming for practical problem-solving, emotional well-being and community learning. The vision is to empower families with right knowledge, confidence and support so that T1D management becomes less fear-driven and more skill-driven. An ongoing peer-support environment has been created for the 34 T1D families currently connected.

The **T1DAware India** initiative was launched alongside this, to increase awareness, education and support for people living with T1D and their families.

**Educational Support Sessions:** More than 15 online parent support and educational sessions have been conducted, covering • Understanding T1D, • Insulin basics and injection techniques, • Insulin timing and wait times, • Hypo-glycemia management, • Hyperglycemia management, • Glycemic Index & food choices, • Carb counting, • ISF (Insulin Sensitivity Factor), • Meal-time dosing, • Managing diabetes in daily life situations.

**Structured Learning Program:** The launch of “HOPE in Reality” implementation journey, currently supporting 4 actively participating families and 1 adult living with T1D for 15 years, focuses on: • Knowledge building, • Practical implementation of learnings, • Parent confidence, • Real-life problem solving.

**School Awareness:** An initial outreach conducted with schools is focusing on • Sharing of ISPAD/ISPAE school resources, • Advocacy for better school preparedness for children living with T1D

**Regional Language Initiative:** Discussions have been initiated for creating Punjabi-language educational content to improve accessibility for families from rural and regional backgrounds.

**Early Outcomes & Observations:** • 1. Parents who receive structured education demonstrate significantly higher confidence in day-to-day diabetes management. • 2. Anxiety around food, insulin and technology reduces when parents understand the reasoning behind management decisions. • 3. Family environment has a direct influence on diabetes outcomes, adherence and child confidence. • 4. Children benefit when parents move from fear-based management to knowledge-based management. • 5. Community support reduces feelings of isolation and creates hope among families navigating T1D. • 6. Participating families report reduced anxiety around insulin, food and glucose fluctuations.

**Participant Feedback:** Following educational sessions, one-to-one discussions and implementation journeys, participating parents and adults living with T1D reported • Increased confidence in insulin management, • Better understanding of food choices and carb counting, • Reduced anxiety around T1D management, • Improved ability to make day-to-day decisions, • Greater emotional resilience and hope, • Increased willingness to educate and support others, • Enhanced confidence in discussing diabetes with schools, family members and the wider community.

The **next phase** will focus on: • Expanding parent education, • Structured implementation worksheets, • School awareness initiatives, including dissemination of the IDEAS videos, • Regional language educational resources, • Documentation of family outcomes, • Sharing findings and experiences with peers in different forums, including the ISPAE meeting in Ahmedabad in October 2026, highlighting the role of education, family support and community engagement in T1D management.

**In summary:** Key Learning emerging from the community is that diabetes outcomes are influenced not only by medical management, but also by parental confidence, emotional support, family environment and access to practical education. Families who understand the "why" behind insulin dosing, food choices and glucose patterns appear more confident in making day-to-day decisions and less likely to manage diabetes from a place of fear & anxiety.

**Acknowledgement:** This work has been made possible through the knowledge, mentorship and guidance received through the IDEAL Program, and through the collective efforts of parents, people living with T1D, diabetes educators, healthcare professionals and community advocates working together to improve outcomes for families living with T1D. The insights, experiences, feedback and participation of families within the T1D Parenting Circle continue to shape and strengthen this initiative.

## TRAINEES SECTION

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



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



<https://forms.gle/8bkfg2J5b9Zc5wE87>

Last Date 10<sup>th</sup> July 2026



The Organising Committee of ISPAE Mid-term Meeting, 2026  
Warmly Welcomes You to Ahmedabad



## HIGHLIGHTS OF THE CONFERENCE

- ISPAE's own national meeting
- One day dedicated to pediatric diabetes and obesity
- Interactive and hands-on workshops on basic and advanced learning in pediatric diabetes and obesity
- Endorsed by ISPAD and UNICEF
- Confirmed ISPAD faculty
- Warm hospitality of Vibrant Gujarat - Food, Culture and Shopping!
- More than 60 national faculty with expertise in various fields

Organising Chairperson  
**Dr. Sudha Rao**

Organising Secretary  
**Dr. Shalmi Mehta**





# 10<sup>TH</sup> ISPAE BIENNIAL MEETING 2027 At Thiruvananthapuram

**Date + venue – will be announced soon**

## Welcome to God's own capital

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