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LAMOT MECHELEN



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Abstracts

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Science | 1: General pediatrics

Non-invasive measurement of cortisol in children with adverse childhood experiences: A systematic review

INTRODUCTION: Adverse Childhood Experiences (ACEs) encompass various traumatic events during childhood, linked to adverse health outcomes in later life. Traditional screening methods have possible pitfalls, leading to a growing interest in the use of biomarkers. METHODS: A comprehensive literature review was conducted resulting in the inclusion of 27 studies examining biomarkers of toxic stress in children. These studies employed diverse methodologies, including hair and saliva sampling techniques, and utilized various assessment tools for childhood adversity. RESULTS: The studies analysed 1,787 hair samples and 4,170 saliva samples for associations between childhood adversity and cortisol. Hair cortisol concentration (HCC) showed a robust positive correlation with cumulative adversity, while salivary cortisol measures showed a less consistent correlation to adversity. DISCUSSION: Age, gender and adversity influence the hypothalamic pituitary adrenal (HPA) axis. Hair cortisol emerged as a possible biomarker for chronic stress exposure, while salivary cortisol measures offered insights into acute stress responses with conflicting results. The discrepancies in findings highlight the need for further research to elucidate the complex interplay between childhood adversity and cortisol dynamics, informing targeted interventions to mitigate long-term health effects.

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Science | 1: General pediatrics

Choosing Wisely - Top 10 recommendations for physicians

Over the past few decades, there have been significant technological and therapeutic advancements in the field of paediatric care. In addition to enhancing patient care, this paradigm shift poses a challenge to current practices, given the abundance of diagnostic and therapeutic options available. Unnecessary interventions often impose a significant burden on young patients, inflate healthcare costs, and impact the environment. It is vital to ensure that care remains evidence-based and free from harm. The European Academy of Paediatrics (EAP) has established a working group "Choosing Wisely". This working group aligns with the philosophy of the international Choosing Wisely movement, aiming to improve children's health by reducing unnecessary medical tests, treatments and procedures by promoting informed conversations within the healthcare community, as between healthcare providers and parents.

Focusing on the European context, the working group has formulated ten key recommendations to guid paediatricians, synthesising international recommendations. These recommendations have been translated into Dutch and French and are awaiting dissemination in Belgium. The recommendations state that the routine use of cough medicines should be discouraged, and unnecessary prolongations of intravenous antibiotics should be avoided. Furthermore, the management of bronchiolitis is addressed. Next, routine antibiotics for acute otitis media and neonates without clinical signs of sepsis are advised against. Further, antibiotics should not last beyond 36 – 48 hours without evidence of a bacterial infection in neonates. Next, well-appearing febrile infants should not remain hospitalized with negative blood cultures and reliable outpatient follow-up. To conclude, broad IgE allergy screens should be avoided without a consistent clinical history, just as a urine cultures in febrile children over 2 months with respiratory symptoms, and physicians should refrain from giving acid blockers or motility agents to infants without clear indications.

The Choosing Wisely campaign is an initiative designed to cultivate a culture that promotes reflection on habits and cognitive biases. It supports that "less" can sometimes truly be "more" for the youngest patients.

More information can be found on the EAP Choosing Wisely website: https://eapaediatrics.eu/choose-wisely/

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Science | 1: General pediatrics

Choosing Wisely - Parent's Booklet

Over the past few decades, there have been significant technological and therapeutic advancements in the field of paediatric care. Parents naturally want the best possible care for their children, but are frequently confronted with an overwhelming array of medical tests, treatments, and opinions. However, more care does not always mean better care: unnecessary procedures and medication can sometimes do more harm than good, leading to additional stress and uncertainty for families. The European Academy of Paediatrics (EAP) has established a working group "Choosing Wisely". This working group aligns with the philosophy of the international Choosing Wisely movement, aiming to improve children's health by reducing unnecessary medical tests, treatments and procedures by promoting informed conversations within the healthcare community, as between healthcare providers and parents.

In order to encourage such communication between parents and healthcare providers, the Choosing Wisely group has developed a parent's booklet. This booklet contains the top ten recommendations for healthcare providers and provides parents with an explanation of each. These recommendations address cough medication use, prolonged intravenous antibiotic use, antibiotic use in particular for acute otitis media and in neonates, and its duration. Furthermore, the management of bronchiolitis is addressed, as whether hospitalization or outpatient care is preferable for febrile infants who appear well. Next, allergy screens with IgE panels, urine cultures and gastro-oesophageal reflux are addressed as well.

This parent's booklet has been translated into both Dutch and French. It offers advices and practical tools for parents to engage in meaningful conversations with their paediatrician. By providing parents with knowledge and tools, it is intended to facilitate a partnership between parents and paediatricians. The objective of this initiative, is that decisions regarding children's care are informed and tailored to what is safest and best for each family. And in certain cases, this means that less is more.

More information can be found on the EAP Choosing Wisely website: https://eapaediatrics.eu/choose-wisely/

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Science | 1: General pediatrics

Optimising influenza vaccination rates in the pediatric high-risk population at Ghent university hospital: a quality improvement project.

Background/Aims

Despite clear recommendations, influenza vaccination coverage among pediatric high risk patients remains suboptimal worldwide and in the University Hospital of Ghent. This contributes to preventable hospital admissions, especially among children with chronic conditions. The aim of this quality improvement (QI) project is to optimize the influenza vaccination rate in the pediatric risk population at our institution to 80%.

Methods

We designed a multidisciplinary QI project guided by the SQUIRE framework. A stakeholder group was established, including two general practitioners, three general pediatricians, one pediatric pulmonologist, one pediatric infectiologist, two pediatric nephrologists, one pharmacist, five specialized pediatric nurses, two ICT professionals, and two administrative staff members. The project is structured around a problem analysis phase, followed by intervention design and implementation planning. Data collection includes a retrospective analysis of vaccination rates, and the identification of barriers through stakeholder input and process mapping.

Results

Preliminary data analysis in the UH Ghent confirms a suboptimal influenza vaccination rate among pediatric patients at risk, with a vaccination rate between 2019-2024 prior to interventions of 20-39%. Inconsistent documentation and referral processes were identified as key barriers. Stakeholder discussions have revealed gaps in awareness among families and variable practices among providers. Proposed interventions include standardized referral pathways, automated electronic health record prompts, and targeted educational materials for both families and healthcare professionals. First implementation and outcome measurements for the influenza season of 2024-2025 showed an increase of vaccination rates to 55%. During the following flu seasons, further work will be done on awareness and new interventions will be rolled out.

Conclusion

Early findings underscore the need for a system-level approach to improve influenza vaccination coverage in the pediatric population at University Hospital of Ghent. Multidisciplinary engagement has proven essential in identifying barriers and shaping feasible interventions. The next phase of this QI project will focus on reevaluation, development of new interventions and evaluation of proposed strategies to achieve sustained improvement in vaccination uptake.

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Science | 1: General pediatrics

A novel procedural pain and distress management tool - Little NIRVANA A randomized control study

Needle procedures are one of the most common medical procedures in children and are often associated with pain, anxiety and/or distress. Little NIRVANA is a holistic and multisensory pain and distress management solution consisting of a series of digital tools that incorporate multiple techniques, such as active distraction and breathing, to support children before, during and after medical procedures. The aim of this RCT is to compare Little NIRVANA with Standard of Care (SoC) during needle procedures and evaluate the effect on pain, anxiety, and distress.
The study took place at UZ Leuven. All children between 2 and 10 years old who were referred to the outpatient service and required a needle procedure were eligible for participation after parental consent. Randomization took place by randomly selecting time windows for Little NIRVANA and SoC. The primary outcome was the FLACC rated by a neutral observer during puncture. Additionally, the child, parent, health care professional (HCP) performing the procedure and observer completed a questionnaire after the procedure to evaluate the level of perceived distress, anxiety, pain and likeability. Independent t-sample tests were used to compare the two groups.
100 children were recruited. The mean age was 5.65 years (SD 2.2) for the little NIRVANA (n=50) and 5.90 years (SD 2.5) for the SoC group (n=50). In the SoC group, 84% of the children received support by local anesthesia and/or distraction (e.g. VR, watching tv). The FLACC score rated during the puncture was significantly higher in the SoC group (mean 4.5, SD 3.9 vs mean 1.54, SD 2.33; $t(96)=-4.5$, $p<.001$). The level of distress during the puncture rated by the child ($t(72)=-3.9$, $p<.001$), parent ($t(96)=-2.16$, $p=0.033$), HCP ($t(96)=-2.54$, $p=0.013$) and observer ($t(96)=-3.68$, $p<.001$) was higher in the SoC group. The level of anxiety rated by the parent ($t(96)=-2.2$, $p<0.030$) and observer ($t(96)=-2.02$, $p=0.045$) were higher in the SoC group. Total procedure time was not significantly different between the two groups ($t(96)=1.58$, $p=0.12$). Children and parents were extremely positive about Little NIRVANA (average scores above 9 on a 10-point scale), but also HCPs (average scores above 8).
The results of this RCT demonstrate that Little NIRVANA helps to reduce procedural distress. Little NIRVANA seems feasible to incorporate into clinical practice without significantly increasing procedure time and with very high satisfaction rates for all stakeholders.

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Science | 1: General pediatrics

Tracing the Vape Journey: Initiation, Habituation, and Cessation Among Flemish Adolescents.

Introduction
Vapes, or e-cigarettes, are electronic devices designed to heat a nicotine-containing liquid to produce an inhalable aerosol. In recent years, the use of vapes among adolescents has increased significantly, where 15% of Flemish youth aged between 12 and 18 years currently use e-cigarettes. Adolescents are particularly vulnerable to adverse events associated with e-cigarette use, due to their increased susceptibility to addiction, poisoning and toxicity from inhalation. Moreover, nicotine has documented adverse effects on brain development and function in adolescents. These developments highlight the importance of gaining a clearer understanding of how adolescents perceive vaping.
Methods
We used a qualitative methodology to explore the perspectives of Flemish adolescents on the use of vapes. We conducted semi-structured focus groups in seven secondary schools in Belgium (Flanders). In total, 25 classes from 3rd to 7th year across different educational fields (general, vocational, technical and art education) participated, representing a total of 421 participants. Data collection was performed using the QUAGOL method for qualitative data.
Results
Three main categories emerged from the focus group discussion that capture the participants' perspectives on the use of vapes: initiation, habituation and cessation. Participants discussed various topics influencing the initiation of vaping including social influence, product factors, experimentation and replacement. Habituation involved effects of vape use, addiction and social image. In the category cessation participants discussed health perspectives together with regulation and education strategies.
Discussion
This study sheds light on how Flemish adolescents navigate the world of vaping; balancing curiosity, peer influence with awareness of risks. Their voices highlight the need for tailored, youth-centered approaches to prevention or cessation.

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Science | 1: General pediatrics

Parental Perspectives on the Future of Children with ADHD: A Cross-Sectional Study

Introduction
Attention-deficit/hyperactivity disorder (ADHD) is a common neurodevelopmental disorder in children, characterized by inattention, hyperactivity, and impulsivity. Its impact often extends beyond childhood into adolescence and adulthood. For parents, raising a child with ADHD can be demanding and brings additional concerns. While ADHD has been widely studied, limited attention has been given to parents' outlook on their child's future. This study aimed to explore parental expectations and concerns regarding the future of children with ADHD and to identify factors associated with more positive or negative outlooks.

Methods
A cross-sectional online survey was distributed among parents of children with a formal ADHD diagnosis in Belgium. The questionnaire included sociodemographic questions about the parent and child, followed by statements assessing parental expectations and concerns about the child's future across several domains: physical health, emotional well-being, education, independence, employment, and relationships, as well as overarching ADHD-related items. Responses were rated on a 5-point Likert scale. Statistical analyses examined associations between socio-demographic or clinical factors and parental outlook across these domains.

Results
A total of 163 complete responses were included in the analysis. Parents who reported better school results for their child, either compared to classmates or since the start of treatment, expressed more optimism about their child's emotional well-being, education, and future independence. Older parents tended to report more pessimistic views across several domains, while a later age at diagnosis was associated with more optimistic views regarding their child's ability to manage distraction and concentration. Lower parental education was associated with greater concern about future substance use.

Discussion
Parental expectations for children with ADHD are primarily influenced by perceived school performance and further shaped by parental age, education level, and age at diagnosis. Understanding these factors may guide clinicians in addressing parental concerns and promoting realistic yet positive expectations for the child's future.

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Science | 1: General pediatrics

A qualitative study on the psychological impact on healthcare providers in Flemish Sexual Assault Centres.

Introduction
Sexual violence is a pressing issue in society nowadays that has received a lot of attention and awareness over the last couple of years. Since 2012, Belgium has been setting up specialised Sexual Assault Centres across the country, of which there are currently ten. These centres offer multidisciplinary support to victims of hands-on sexual violence. This qualitative study aims to investigate how the healthcare providers in the Flemish centres experience their work and how they deal with coming into daily contact with traumatic narratives.

Methods
Semi-structured interviews were conducted with healthcare providers working in one of the Flemish Sexual Assault Centres, who come into direct contact with victims of sexual assault. Participants were recruited after providing informed consent.

Results
The study included interviews with 19 healthcare providers, distributed over the five Flemish centres and with a wide range of professional roles, employment rate and years of experience in the centre. Different topics were discussed on the level of the healthcare provider, the team, the victim, structural, personal environment and society. Interactions with victims often evoke strong emotional responses, feeling concern and powerlessness. Also, the unpredictable workload puts a strain on the employees and can enhance compassion fatigue. Another recurring theme was a changed perspective on society and the influence of the theme of sexual violence on the upbringing of children, bringing more attention to sexuality and boundaries. Contrary to this, participants emphasised the importance of good team dynamics as a key protective factor and the value of informal and formal debriefing with colleagues. The gratitude of victims and a belief of social importance bring passion and motivation to the healthcare providers.

Discussion
Working in a Sexual Assault Centre influences multiple dimensions of healthcare providers, shaping their wellbeing, societal view and personal environment. The findings of this study underline the importance of open dialogue, investment in team support and organisational awareness for maintaining compassionate care within the flourishing Sexual Assault Centres.

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Science | 1: General pediatrics

Minors in Medicine Study: Parents’ perspectives and preferences on access to the electronic medical record of adolescents.

Introduction
In Belgium, adolescents may exercise their patient rights independently if they are deemed mature. However, parents often still have access to their children's electronic health records (EHRs), which can lead to ethical and practical issues. Some hospitals and digital platforms have attempted to address this, yet a unified national regulation is lacking. This qualitative study aims to explore parental preferences and perspectives regarding access to their adolescents' EHRs.
Methods
A qualitative study was conducted using semi-structured interviews with Flemisch parents, who had at least one minor child. Participants were recruited after providing informed consent. Interviews were transcribed ad verbatim and thematically analysed to identify key themes related to parental access.
Results
The study included interviews with 17 parents of children aged between 10 and 22 years old (median age group: 16-18 years). Four key themes concerning the importance of, and desired regulation around access were identified by parents: parent-related factors, child-related factors, context-related factors (including subject matter and family dynamics) and system-related factors (including advantages and disadvantages, and practical implementation).
Parental responsibility, both moral and legal, was often cited to justify continued access until the age of 18 or beyond. This in contrast to various existing policies in Belgium which often restrict parental access at earlier ages. Another notable finding was parents’ ambivalence regarding mental health. While they wanted to respect their adolescents’ privacy, they also felt a strong need to be kept informed in order to prevent potentially harmful situations.
Discussion
Although research on adolescents’ EHRs remains limited, this study highlights that achieving a balance between confidentiality and parental involvement is both challenging and crucial. Shared decision-making between adolescents, parents, and healthcare professionals emerged as the preferred model. The findings of this study may serve as a framework for the development and implementation of regulations regarding access to adolescents’ EHRs. More extensive research on a larger scale and with a more diverse sample is needed, as well as research into adolescents’ perspectives on this topic.

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Science | 1: General pediatrics

Adolescents’ Perspectives on the Use of Energy Drinks: A Qualitative Study

Introduction
Energy drinks (EDs) are caffeinated beverages often combined with other stimulants and marketed as enhancers of energy, performance, and mood. Over the past decades, the global ED market has grown rapidly, with adolescents becoming a key target group through youth-oriented and social media–driven marketing strategies. Despite health recommendations discouraging consumption under the age of 16, ED use remains highly prevalent among European adolescents. Excessive intake has been linked to a range of adverse health outcomes. In Belgium, where no legal age restrictions or prevention campaigns are in place, the growing popularity of EDs among youth raises public health concerns. This study therefore aimed to explore adolescents’ attitudes and perceptions towards energy drink consumption within the Flemish context.

Methods
A qualitative research design was adopted, employing semi-structured interviews in the form of class discussions to gain an in-depth understanding of adolescents’ attitudes towards energy drinks. Participants were recruited from seven secondary schools across Flanders, including students from the third to the seventh grade. Informed consent was obtained prior to the start of the study. Data were analysed following the QUAGOL (Qualitative Analysis Guide of Leuven) method.

Results
The opinions of 421 students from 25 classes were obtained (mean class size = 17). The students' ages ranged from 14 to 20 years old. The use of EDs could be described based on the socio-ecological model, with individual factors (perceived benefits, side effects and knowledge), interpersonal factors (peer pressure and social image, sports, parental and other adult influences) and environmental factors (lack of regulation, social media, advertising and branding, affordability and availability) leading to (excessive) use of EDs.

Discussion
This study examined adolescents' attitudes towards EDs in the Flemish context. A combination of factors has been identified that adolescents cite as reasons for ED use. As the adolescents themselves indicate that their knowledge of the negative effects of EDs is limited, policymakers should address this issue in order to reduce excessive consumption in this age group.

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Science | 1: General pediatrics

MATERNAL PERSPECTIVES ON THE USE OF ORAL CONTRACEPTIVES IN THEIR DAUGHTERS

Introduction
Oral contraceptives (OCs) have shaped women's health and sexual autonomy since their FDA-approval in the 1960s. Despite being one of the most popular contraceptive methods among adolescents, little is known about the preceding decision-making process and the maternal factors influencing adolescents' acceptance of OC use. Mothers often act as primary decision-makers and sources of information, yet their opinions and parenting styles in this context remain underexplored. This study surveys over 360 mothers to explore their perspectives on OC use for their daughters and personal factors shaping these views, thus leading us to correlate maternal factors with eventual healthcare decisions for their daughters.
Methods
A cross-sectional online survey was conducted among 360 Dutch-speaking mothers in Flanders with at least one daughter aged 10–20 years. The questionnaire included demographic items, the s-EMBU to assess parenting style, and ten hypothetical case scenarios concerning OC prescriptions for adolescents. Data were analyzed using SPSS version 28 with descriptive statistics, Pearson correlations, linear regression, and one-way ANOVA ($p < 0.05$).
Results
A total of 360 mothers participated in the study. Most were between 40 and 50 years old (60.8%), held a higher education degree (59.7%) and were employed full-time (57.8%). The majority were married or cohabiting (70.6%). Personal contraceptive experience was common: 82.8% of mothers reported to have used oral contraceptives in the context of contraception and an additional 7.8% in the context of other medical reasons. Healthcare providers were identified as the main source of information about oral contraception (81.4%), whereas media or family and friends were rarely cited. Religious affiliation varied, with Roman Catholic (41.7%) and no religious belief (38.6%) being most common. Specific demographic characteristics and parenting styles relate to maternal attitudes toward OC in adolescents.
Discussion
In this preliminary analysis, Flemish mothers demonstrated high levels of familiarity towards oral contraceptives and primarily relied on healthcare providers for information. The demographic profile suggests a population likely to be receptive to medically substantiated information about OC use. Understanding these perspectives can support clinicians in tailoring contraceptive counselling and improving shared decision-making in adolescent care.

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Science | 1: General pediatrics

Pediatric procedural sedation and analgesia in the University Hospitals Leuven: A Qualitative Study

Introduction
Medical procedures in children can induce anxiety, loss of trust, and long-term trauma. Up to 80% of medical trauma in adults originates from negative healthcare experiences during childhood. To address this, the PROSA team (Pediatric procedural sedation and analgesia) was established at University Hospitals Leuven, where specialized nurses guide children through painful and stressful procedures. This study explores how pediatric nurses perceive the PROSA team and identifies the benefits and challenges encountered in daily clinical practice.

Methods
Semi-structured interviews were conducted with pediatric nurses from various units within UZ Leuven. The interview guide was developed based on the five domains of the Consolidated Framework for Implementation Research (CFIR): innovation, outer setting, inner setting, individuals, and implementation process. Data were analysed using the QUAGOL methodology, informed by Grounded Theory principles. Identified themes and subthemes were systematically linked to relevant CFIR constructs.

Results
The findings demonstrate that the PROSA team has evolved into a specialized centre of expertise that not only offers procedural support but has also fostered a cultural shift within pediatric care: a renewed mindset focused on maximizing child-centred, safe, and comfort-enhancing care. Nurses emphasized that PROSA safeguards procedural safety and often reduces the need for anesthesia or deep sedation, resulting in less invasive and more positive care experiences for children. Several challenges were also identified. The use of nitrous oxide may involve adverse effects or paradoxical reactions. Limited staffing and the lack of continuous availability impede full implementation. Cultural differences in pain perception and expression add further complexity. Finally, the transition from pediatric to adult care represents a critical concern: adolescents who relied heavily on PROSA support often lose their familiar care environment upon transfer.

Discussion
The PROSA team provides clear added value in reducing pain and anxiety associated with pediatric procedures. Preparation, communication, parent involvement, and the judicious use of sedation contribute to safer and more child-centred care. Nonetheless, further optimization and expansion remain necessary, particularly regarding resource allocation, interdisciplinary integration, and continuity of care during the transition to adult services.

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Science | 1: General pediatrics

A Hidden Burden: Adverse Childhood Experiences and Quality of Life Among Children in Tertiary Pediatric Care

Introduction: Adverse Childhood Experiences (ACEs) have profound social, economic, psychological, and physical consequences. They are strongly associated with long-term health problems and reduced Quality of Life (QoL). Their prevalence and impact in pediatric tertiary care are understudied. This study investigated ACE prevalence in a clinical pediatric cohort, compared findings with an age-matched school-attending population, and analyzed associations between ACE exposure, QoL, and disease severity.

Methods: A cross-sectional study was conducted involving 292 participants from the pediatric outpatient and inpatient wards at Ghent University Hospital. Ten core ACEs were assessed using a validated Dutch questionnaire, alongside four additional adversities. QoL was measured with the KIDSCREEN-10 index. ACE and QoL outcomes were analyzed both internally and compared with the school-attending Augeo reference cohort. Associations with disease-related characteristics were examined exclusively within the clinical cohort.

Results: The overall ACE distribution did not differ significantly, while specific ACE categories showed significant disparities between the current clinical study and the reference school population. Domestic violence and parental depression or suicidality were significantly more prevalent in the tertiary care cohort ($p < 0.001$ and $p = 0.001$, respectively). QoL was consistently lower in the clinical cohort (Mean QoL 51.1 vs. 56.2 in the reference population, Cohen's $d = -0.5$). The most pronounced QoL reductions (large negative effect sizes) were associated with sexual abuse ($d = -1.3$), physical abuse ($d = -1.1$), emotional abuse ($d = -0.8$), and parental depression or suicidality ($d = -0.8$). A dose-response relationship was demonstrated: increased ACEs were associated with progressively reduced QoL ($p < 0.001$). No association was found between ACEs or QoL and clinical disease severity.

Conclusion: Disproportionate exposure to specific ACEs and a significantly reduced QoL was demonstrated in children in follow-up at a tertiary care clinic. This might suggest that the chronic physical and/or mental stress of their underlying disease is associated with increased psychosocial vulnerability. Integrating trauma-informed care and routine psychosocial screening into tertiary pediatric workflows is essential to mitigate stress and to support children and their families.

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Science | 1: General pediatrics

Does Brain Lesion Timing Influence Proprioception in Children with Unilateral Cerebral Palsy?

Introduction: Upper limb tactile deficits are common in children with unilateral cerebral palsy (uCP) and differ according to presumed lesion timing, i.e., predominant white matter lesions (PWML) and predominant grey matter lesions (PGML). Nevertheless, the impact of lesion timing on proprioception has not been systematically investigated. This study compared somatosensation, with a specific focus on proprioception assessed through objective measures, between typically developing children (TDC) and children with uCP with different presumed lesion timings. We hypothesized better tactile function and proprioception in children with PWML than those with PGML. We further expect reduced proprioception in both groups of children with uCP compared to TDC.

Methods: Forty-two children with uCP (age=11y10m±2y10m) were classified as PWML (n=32) or PGML (n=10), based on structural MRI. Tactile registration (Semmes-Weinstein monofilaments), tactile perception (stereognosis, two-point discrimination) and distal and proximal proprioception (ETH MIKE and Kinarm exoskeleton) were assessed. Proprioception was additionally evaluated in 42 age- and sex-matched TDC (age=11y10m±2y9m). Between-group differences were analyzed using generalized estimating equations (?<0.05, mean difference (?)), with Bonferroni-corrected post hoc test.

Results: Children with PGML showed worse tactile registration (p=0.028, ?=-5.63) and tactile perception (p<0.001-0.006, |?|=2.32-3.16) in their more-impaired hand, compared to children with PWML. Children with PGML showed generally worse distal proprioception for absolute error compared to TDC (p=0.006, ?=-4.49), while variability differed significantly between all groups (PGML>PWML>TDC; p<0.018, ?=-1.50-(-4.77)). Furthermore, worse proximal proprioception was found in children with both PWML and PGML (p<0.001, ?=-1.50-(-4.77)), compared to TDC.

Discussion: Our study confirmed that children with PGML have worse tactile function. We further showed that distal proprioception was predominantly reduced in children with PGML compared to those with PWML and TDC, while proximal deficits were present independent of brain lesion timing. While larger disruptions in somatosensory anatomy may explain the poorer outcomes in PGML, future studies should integrate lesion timing with other neurological factors such as lesion location and extent to further unravel the underlying neurology of proprioceptive deficits.

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Science | 2: Neonatology – pediatric intensive/emergency care

Evolution of Cerebral Palsy Diagnosis in Children: A Comparative Cohort Study over Two Decades

Introduction: Early diagnosis of cerebral palsy (CP) enables timely intervention and improved outcomes. International guidelines recommend standardized tools such as magnetic resonance imaging (MRI), the Hammersmith Infant Neurological Examination (HINE), and the Prechtl General Movements Assessment (GMs) for early detection. This study evaluated how the diagnostic process of CP has evolved over time at University Hospitals Leuven (UHL).
Methods: We conducted a retrospective cohort study including children with CP who had been admitted to the UHL NICU at birth between 2006–2010 and 2016–2020. Clinical and neurodevelopmental data were extracted from medical records. Primary outcomes were age at diagnosis and use of diagnostic tools. Secondary outcomes included timing of parental communication, referral to the CP reference center, and initiation of early interventions.
Results: Seventy-eight children were included (38 in 2006–2010; 40 in 2016–2020). Median age at CP diagnosis remained stable (12.0 vs. 10.5 months; $p = 0.564$) and was close to ages reported in international cohorts after full implementation of guideline-recommended early detection pathways. This was achieved despite the absence of routine use of standardized assessments such as the HINE, GMs, and Hand Assessment for Infants (HAI). Children with higher GMFCS levels were diagnosed earlier. The more recent cohort showed earliers communication of motor concerns, earlier referral to specialized care, and earlier initiation of intervention such as constrained-induced movement therapy (CIMT) and home guidance, indicating strengthened clinical awareness and care coordination.
Discussion: Although the median age at CP diagnosis did not change significantly over time, it closely approached the diagnostic ages reported in centers with full implementation of standardized early detection tools. Earlier communication, referral, and intervention in the recent cohort illustrate meaningful progress within existing follow-up structures. Further integration of standardized tools is expected to enhance early detection and outcomes even more.

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Science | 2: Neonatology – pediatric intensive/emergency care

Perception of PAIN AND ANXIETY AMONG PEDIATRIC POPULATION IN THE EMERGENCY DEPARTMENT - An Observational Survey

Introduction
Pediatric pain is a major reason for presentation to the Pediatric Emergency Department (ED), and it is also a frequent secondary consequence of necessary medical procedures. Pain can lead to additional distress and anxiety, while anxiety may in turn intensify the perception of pain. Recognition and management of pediatric pain in the ED remains challenging. Despite advances in both pharmacological and non-pharmacological approaches, children remain particularly vulnerable. As pain and anxiety significantly influence long-term treatment adherence and healthcare-seeking behaviour, it is essential to gain accurate insight into these experiences. The primary objective of this study is to assess and characterize the experience of pain and anxiety in children presenting to the ED, and to determine whether a correlation exists between the two. A secondary objective is to evaluate parents' assessment of their child's pain and anxiety, as well as the potential impact of parental anxiety.
Methods
This prospective observational study will be conducted at UZ Leuven during the winter period of 2025–2026. Children presenting to the ED will be assessed using the Children's Fear Faces Scale and the Wong-Baker FACES Pain Rating Scale. Parents will report their own anxiety, as well as their perception of their child's pain and fear. Descriptive statistics will be used to analyse the data, with statistical significance set at $p < 0.05$. Odds ratios will be calculated to describe significant associations.
Results
We expect to enrol 150 child-parent dyads and evaluate their pain and anxiety levels during assessment or treatment for various procedures in the ED. Data will be available at the time of the conference.
Conclusion
Understanding patterns of pain and anxiety in the pediatric ED population is a crucial first step in developing accessible and time-efficient strategies to reduce pain and fear, ultimately mitigating both short-term and long-term physical and psychosocial consequences.

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Science | 2: Neonatology – pediatric intensive/emergency care

Neonatal Late-Onset Sepsis Recovery Score – A clinical cure score to monitor antibiotic treatment

INTRODUCTION Neonatal sepsis is one of the leading causes of neonatal death worldwide and associated with significant morbidity. Early initiation and timely cessation of antibiotics is crucial to reduce mortality, morbidity, drug toxicity and antimicrobial resistance. Accurate endpoints to monitor antibiotic treatment in neonatal late-onset sepsis (LOS) are lacking. Though clinical cure is commonly used as core outcome in neonatal sepsis studies, a validated consensus definition is missing. The aim of this study was to develop and validate a clinical cure score to assess treatment efficacy in neonatal LOS.
METHODS In the score development phase, a core group first identified clinical items based on literature review and focus group discussions. Next, using a Delphi approach, a multidisciplinary expert panel reached consensus on final items and definitions. Content validity was assessed with the content validity index (CVI) with item-level CVI target of ?0.78, and scale-level CVI of ?0.80 (universal agreement) and ?0.90 (average agreement). Subsequently, face validity was assessed by surveying international end-users about the comprehensibility and user-friendliness of the score. As an illustration, the score was applied to 10 clinical cases (5 sepsis, 5 control).
RESULTS In total, nine experts from Belgium, Germany, Norway, Switzerland, The Netherlands and Turkey needed 7 surveys and 9 meetings to reach the CVI targets. The Neonatal Late-Onset Sepsis Recovery score was developed comprising 9 clinical items. Maximum score is 24 for ventilated, and 27 for non-ventilated neonates, with higher scores corresponding to well recovering neonates. Definitions are based on a back to baseline concept. A total of 87 end-users from 23 hospitals completed the face validity survey (48% neonatologists, 32% nurses). Mean ratings for comprehensibility and user-friendliness were 4.4/5. When applied to 10 clinical cases, mean score at onset and end of sepsis was 22.9/27 and 26.7/27, respectively. Mean score for control neonates was 26.2/27.
DISCUSSION The development phase of the Neonatal Late-Onset Sepsis Recovery Score has been completed. This is the first step towards a tool to assess antibiotic treatment efficacy in neonates with LOS. Currently, the score evaluation phase is ongoing in which the inter- and intra-rater variability will be assessed. Finally, the score will be validated in a prospective clinical study where a cut-off for clinical cure will be determined.

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Science | 2: Neonatology – pediatric intensive/emergency care

Clinical Scores to Assess treatment response in Neonates with Late Onset Sepsis: a Narrative Review and Retrospective cohort study

Introduction: Neonatal sepsis is a life-threatening condition with high morbidity and mortality. While antibiotics are standard treatment, the optimal marker to assess treatment response remains unclear. This study reviews clinical scores for late-onset sepsis (LOS) severity assessment and applies the neonatal Sequential Organ Failure Assessment (nSOFA) score during vancomycin treatment on a retrospective cohort.
Methods: A PubMed review identified studies evaluating clinical scores in neonatal LOS. Additionally, a retrospective dataset of the University Hospitals Leuven (November 2017-June 2019) was used to explore the association between the most extensively studied score at the start of vancomycin treatment and at 6, 12, 24 (day 1), 36, 48 (day 2), 72 (day 3), 96 (day 4), 120 (day 5), 144 (day 6), and 168 (day 7) hours after vancomycin initiation and mortality and hospital stay in vancomycin-treated neonates. All culture-positive cases were included, and gestational age-matched with culture-negative cases. Scores were compared across predefined patient subgroups.
Results: Among 805 screened studies, 19 met inclusion criteria, evaluating 11 scoring systems for LOS risk assessment and diagnosis, with nSOFA being most frequently studied. Our cohort included 35 culture-positive and -negative cases. Higher scores at early time points (0 hours and Day 2) were significantly associated with mortality. From Day 3 onwards, higher nSOFA scores were associated with prolonged hospitalization. No significant differences in nSOFA scores were observed between culture-positive and culture-negative neonates or between therapeutic versus subtherapeutic vancomycin exposures
Conclusion: In our cohort, higher nSOFA scores were associated with mortality and prolonged hospitalization. Standardisation, and electronic health record integration might facilitate score implementation. In the current study design, nSOFA showed limitations to monitor LOS treatment response. Besides validation in larger cohorts, we anticipate an optimal score needs more clinical items for bedside monitoring.

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Science | 2: Neonatology – pediatric intensive/emergency care

Development of a care bundle for late-onset sepsis prevention in a single-center NICU

Background: Late-onset sepsis (LOS) remains a major cause of morbidity and mortality in neonatal intensive care units (NICUs), particularly among preterm neonates. Numerous preventive strategies have been proposed, yet variation in their effectiveness and implementation persists. Objectives: This review aimed to evaluate the current evidence for interventions to reduce LOS incidence and assess their potential for integration into clinical practice. Methods: MEDLINE was searched to conduct a review of observational and experimental studies, including systematic reviews and meta-analyses, examining preventive strategies targeting LOS in neonates. Studies were assessed for risk of bias. Interventions were compared with current practices at the NICU of the University Hospitals Leuven. Results: A total of 45 primary studies and 27 systematic reviews and meta-analyses were included. Statistically significant reductions in LOS incidence were associated with oropharyngeal colostrum administration (up to 69% reduction, p=0.002), the use of mother's own milk or donor human milk when maternal milk is unavailable (up to 66% reduction, p=0.023), the preference for enteral feeding (up to 55.9% reduction, p<0.016) and strict hand hygiene compliance (up to 100% reduction, p=0.028). Kangaroo mother care, Golden Hour protocols and family-integrated single-room care also demonstrated positive outcomes regarding LOS prevention. The use of probiotic supplementation yielded mixed results, with safety concerns warranting cautious interpretation. Supplementation with bovine lactoferrin (especially when combined with probiotics), prophylactic use of antibiotics, selenium supplementation and glutamine supplementation were each linked to reduced LOS incidence. However, heterogeneity in study design, dosing regimens and populations limits the generalizability of some findings. Interventions such as adequate antiseptic skin and cord care, topical coconut oil, and caffeine therapy may offer additional benefit, but require further validation. Conclusion: This review highlights a spectrum of evidence-based interventions for LOS prevention, which might serve as a basis for improvements of our local protocol. Given ongoing uncertainty around certain strategies, particularly probiotics and prophylactic pharmacological interventions, further high-quality RCTs are warranted. Translating (new) effective interventions into standardized protocols remains essential to optimize neonatal outcomes.

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Science | 3: Infectiology – pneumology - immunology

THE BURDEN OF RESPIRATORY SYNCYTIAL VIRUS-ASSOCIATED HOSPITALIZATIONS IN CHILDREN IN BELGIUM: A RETROSPECTIVE STUDY BASED ON ADMINISTRATIVE DATA

Background
RSV-related respiratory tract infections in young children represent a major disease burden worldwide, but data on RSV-associated hospitalizations in Belgium are limited. This study aims to characterize the clinical burden of RSV-associated hospitalizations, describe the affected population, and assess healthcare resource utilization (HCRU) and associated costs in children in Belgium.
Methods
This retrospective study used routinely collected data from RSV-associated hospitalizations in children aged <24 months in nine Belgian hospitals during the 2018–2019 and 2019–2020 RSV seasons. RSV-associated hospitalizations were identified using ICD-10 codes. Patient data on demographics and clinical characteristics, HCRU (i.e. length of stay and treatment), and associated costs (i.e. inpatient, pharmaceutical, procedure and other non-medical costs) were extracted, pooled, and analyzed descriptively.
Results
During 2 RSV seasons, 2998 RSV-associated hospitalizations in children younger than 2 years were identified, of which 82.8% occurring in children under 12 months and 47.8% in those up to 3 months. Most hospitalizations (86.3%) were reported in previously healthy term-born children. Comorbidities associated with an increased risk of severe RSV disease were reported for 13.7% of hospitalizations, primarily prematurity (6.0%), congenital circulatory malformations (4.0%) and Down syndrome (1.3%). Bronchiolitis was the primary diagnosis (89.2%). Median duration of hospitalization was 4.0 days. ICU admissions were reported for 9.4% of hospitalizations (median 4.0 days). Besides limited evidence inhaled selective beta-2-adrenoreceptor agonists (42.3%), anticholinergics (26.4%), glucocorticoids (19.2%), and systemic antimicrobials (31.7%) were reported to be used at least once as treatment. The median hospitalization cost was €2,008.
Conclusion
This study showed a substantial clinical and financial burden of RSV-associated hospitalizations in children aged <24 months, primarily affecting healthy term-born infants. These data may help guide implementation and inform evaluations of RSV preventive strategies.

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Science | 3: Infectiology – pneumology - immunology

NOVEL RSV PREVENTION STRATEGIES: PARENTAL MOTIVATION AND ATTITUDES TOWARD NEWBORN IMMUNIZATION IN ANTWERP (BELGIUM)

Introduction: RSV (Respiratory Syncytial Virus) is the leading cause of lower respiratory tract infections in infants, causing significant morbidity and mortality. Both nirsevimab, a long-acting monoclonal antibody against RSV and the maternal RSV preF vaccine were recently implemented in Belgium. This ongoing study aims to investigate parental willingness to newborn immunization compared with willingness to get the maternal vaccine by parents in the Antwerp maternity wards.

Methods: A digital questionnaire, including demographic information, Parental Attitude towards Childhood Vaccination (PACV-5), and open-ended questions gauging the parental opinion towards nirsevimab was completed by parents of infants eligible for RSV prevention strategies in both the first year of reimbursement and the second year. Data from the 2024–2025 season have been analyzed, while data collection for 2025–2026 is ongoing.

Results: From end-December 2024 until mid-February 2025, 52/206 eligible parents participated, mostly Caucasians (77%) and non-religious (64%). In this first year, vaccine hesitancy (VH), per PACV-5, was observed in 17%, with ethnicity as the only predictive factor (OR 6,43 compared to Caucasian). 45/52 were open to immunizing their child, 2/52 did not. When given the choice, 52% preferred nirsevimab over maternal vaccination. After receiving effectiveness information, nirsevimab was favored by most (?2McNemar's 12.19), p = 0.0005).

Reasons for immunization refusal in 2024-2025 included side effects, insufficient research being done, believing the drug is ineffective, low perceived susceptibility of the disease, low trust in vaccines or research in general, and preferring natural immunity. Acceptance was driven by prevention, herd immunity, effectiveness, and previous experiences.

Discussion: In this preliminary analysis of 2024-2025 data, most parents held positive attitudes toward nirsevimab and were willing to immunize their newborns. Initially, people did not prefer nirsevimab on maternal vaccination, but with additional information on effectiveness, more people opted for nirsevimab.

Data collection for the 2025–2026 season is ongoing and will be available for comparison at the time of the congress. A comparative analysis between the two years will be carried out to assess trends in parental attitudes and hesitancy over time.

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Science | 3: Infectiology – pneumology - immunology

A SYSTEMATIC REVIEW ON VACCINE HESITANCY FOR CHILDHOOD IMMUNIZATIONS IN EUROPE: CAN FINDINGS BE GENERALIZED?

Introduction: Although vaccine hesitancy (VH) has been extensively studied, no comprehensive review has synthesized the knowledge on parental VH for childhood immunizations in Europe. This review aims to fill this gap, incorporating both qualitative and quantitative perspectives.

Methods: We conducted a systematic review in MEDLINE/Pubmed and Web of Science, including qualitative and quantitative studies to explore generalizability of VH findings regarding VH across Europe, from January 1st, 2015 to December 31st, 2024.

Results: 49 articles were selected out of 1.610 unique articles. Using WHO's 3C model for VH (confidence, convenience, complacency), the importance of confidence in healthcare professionals (HCPs) was identified as important across countries, while fear of side effects, logistical barriers and perceived disease risk have a negative impact on vaccination decisions. Demographic factors were not generalizable, due to cultural, socioeconomic and healthcare system differences as well as differences in study methodologies.

Discussion: VH for childhood immunizations is multidimensional and context-dependent. WHO’s 3C model serves as a useful framework addressing VH. Given the variability in vaccine attitudes across Europe, tailored country- and context-specific approaches are essential when implementing immunizations and while designing campaigns to address VH. However, trusting and supportive relationships between HCPs and caregivers are crucial in promoting childhood immunization uptake. Furthermore, convenience-related barriers highlight the need for policies that account for socioeconomic factors and promote equitable access.

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Science | 3: Infectiology – pneumology - immunology

The link between pulmonary exacerbations and respiratory viruses in young children with cystic fibrosis.

Objectives
The objective of this study is to assess if viral infections will trigger a Pulmonary Exacerbation (PEx) in children with Cystic Fibrosis (CF) and to identify patient-related risk factors.

Methods
Children with CF, aged zero to five years, were included at the pediatric CF clinic of Antwerp University Hospital (UZA) between January 2024 and 2026. Oropharyngeal swabs for the detection of respiratory viruses by PCR were obtained during routine visits and at the time of PEx. Patients were divided into two groups (with and without PEx) and the following patient-related factors was recorded: age, gender, CFTR gene mutation, bacterial colonization, lung function, BMI and socioeconomic factors.

Results
During the study period, 15 of the 21 included children experienced at least one PEx. Generalized Estimating Equations analysis showed an almost 12 times higher chance of detecting viral presence during PEx compared to routine visits (p=0.010; OR=11.66). The confounders female sex (p=0.046), lower BMI (p=0.013) and seasonal variation (p=0.032) were significantly associated with viral detection. The most prevalent virus detected during PEx was rhinovirus. Only parainfluenzavirus type 3 (PIV3) had a significantly higher presence during PEx compared to routine visits (p=0.027). Multivariate logistic regression showed no significance for patient related factors as a risk factor for the development of a PEx. Univariate analysis did show a significant effect of the patient's CFTR mutation type (p=0.067). It showed a correlation between the Fdel580 mutation and more frequent exacerbations.

Conclusion
Viral presence is almost 12 times higher during PEx compared to routine visits. Rhinovirus was the most prevalent virus during PEx, and PIV3 showed a significantly higher presence during PEx. There were no patient-related factors found that contribute to the development of PEx.

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Science | 3: Infectiology – pneumology - immunology

Quality of Online Infectious Disease Education: A Comparison of TikTok and YouTube Content

Introduction
Short-form social media platforms are increasingly used for disseminating health information, yet concerns remain about the reliability and accuracy of content shared. This study evaluated the quality of online educational videos on three travel-related infectious diseases - Hepatitis A, Malaria, and Rabies - comparing performance across YouTube and TikTok to assess how platform and disease influence content quality.

Methods
A dataset of 493 videos was analyzed. Normalized total scores were calculated using multiple validated tools assessing credibility, understandability, actionability, and medical accuracy. Because assumptions of normality and equal variance were not consistently met, Wilcoxon rank-sum tests were used for pairwise platform comparisons and one-way ANOVA with Tukey post-hoc tests for comparisons across diseases, both globally and within platforms.

Results
YouTube videos achieved significantly higher total normalized scores than TikTok (median 38 vs. 26.43; $p<0.001$; small effect). A significant global effect of disease was observed ($p<0.001$), with Malaria scoring lower than Hepatitis A. Platform-specific analyses showed consistently lower TikTok scores across all diseases, with moderate effects for Hepatitis A and Malaria and a small effect for Rabies. On YouTube only, Malaria scored significantly lower than Hepatitis A ($p=0.013$), while no disease differences remained on TikTok.

Discussion
Overall educational quality about travel-related infectious diseases is higher on YouTube than TikTok, suggesting that platform characteristics may influence reliability and completeness of medical information. Disease impacts content quality differently across platforms: distinctions between diseases appear on YouTube but diminish on TikTok, indicating more uniformly low-quality content. These findings highlight the need for improved content oversight and greater involvement of qualified professionals, particularly on rapidly growing short-form platforms.

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Science | 3: Infectiology – pneumology - immunology

Optimizing pediatric asthma care by educating healthcare providers in emergency departments, unveiling the impact on oxygen therapy.

Introduction: Asthma is one of the most common chronic diseases in children. Asthma exacerbations (AE) serve frequently as a primary cause for emergency department (ED) visits. The Global Initiative for Asthma (GINA) recommends administration of systemic corticosteroids (SCS) within the first hour of presentation to optimize therapeutic impact. However, research revealed only 25% of children met optimal timing. To improve the quality of care for asthmatic children, we started an education program for healthcare professionals focused on timely SCS administration. After implementation, we investigated whether timely administration of SCS improved and the impact on oxygen treatment.

Methods: This multi-center, retrospective, pre-and-post intervention, medical chart review included children (<18 years old) presenting to an ED of an Antwerp Pediatric Asthma Network (APAN) hospital with a moderate-to-severe AE. Patients were included before the education program from 01/01/2019 until 31/12/2020 and up to 12 months after education from 12/01/2024 until 31/01/2025. The intervention consisted of a standardized protocol, educative sessions and educative material such as leaflets.

Results: A total of 368 patients were included in the analysis: 205 patients before and 163 after the education. Timely administration of SCS increased significantly post-intervention (13.7% vs 33.1%, $p<0.001$). There was no significant reduction in the duration of oxygen administration (1 (0-3) days vs 1 (0-3) days, $p=0.344$), oxygen flow (1 (0-2) L/min vs 1 (0-2) L/min, $p=0.435$)) or need for oxygen (57.1% vs 61.3%, $p=0.470$). The method of oxygen administration differed significantly post-intervention (nasal cannula: 45.4% vs 56.4%, mask: 6.8% vs 4.3%, optiflow: 4.9% vs 0.6%, no oxygen: 42.9% vs 38.7%, $p=0.024$). Time to SCS administration correlated significantly with the duration of oxygen administration ($p=0.018$).

Discussion: This study showed an improvement in timely administration of SCS. However, no significant reduction on the duration, amount, nor the need for oxygen after education. This might be explained by a remaining significant percentage of patients that receive their SCS too late. Because time to SCS administration correlates significantly with the duration of oxygen administration, improving the education to speed up SCS administration remains important for further research to enhance asthma management.

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Science | 3: Infectiology – pneumology - immunology

The PID-COSI study: Screening for Primary Immunodeficiencies (PID) after a first episode of Community-Onset Severe Infection (COSI).

Introduction: Primary immunodeficiencies (PID), currently renamed as inborn errors of immunity (IEI), are heterogeneous disorders causing impaired immune function and increased susceptibility to infections. While current guidelines recommend PID screening after a second severe invasive infection, in this study we systematically screened children from their first episode of community-onset severe infection (COSI). This study investigated the clinical presentation, immunological abnormalities, and genetic defects of PIDs in children with viral or bacterial COSI admitted to the pediatric intensive care unit (PICU).
Methods: This prospective, single-centre study conducted at Ghent University Hospital systematically screened for PID in previously healthy children between 1 month and 18 years admitted to the PICU with COSI. Between August 2023 and May 2025, 50 patients with COSI and confirmed pathogen isolation were enrolled in this study. Immunological testing was performed at least one month post-infection in all surviving patients, and a subset of the cohort (48%) received additional genetic testing; including the deceased children who underwent genetic analysis only. Confirmed PIDs were defined by significant immunological abnormalities and/or pathogenic genetic variants, whereas probable PIDs involved mild abnormalities awaiting confirmatory testing or genetic results.
Results: The immunological investigations detected abnormalities in 23 out of 50 patients (46%) and all four children with viral infections presented at least one immunological anomaly. Confirmed PID was revealed in 14 patients (28%). The diagnoses include: 4 cases of IgA deficiency, 2 cases of IgG3 deficiency, 1 case of IgA and IgG deficiency, 1 case of B cell lymphopenia, 3 cases of MBL deficiency, 1 case of complement disorder and specific polysaccharide antibody disorder, 1 case of T cell lymphopenia and 1 genetically confirmed IEI of cartilage-hair hypoplasia. Furthermore, 9 patients (18%) showed probable PID and await follow-up.
Discussion: The results of this study provide important insights into the need for PID screening in children hospitalized for invasive infections at PICU. PID was confirmed in 28% of children, with another 18% showing probable signs of PID. Based on these results, PID screening after a first COSI could facilitate the early detection of PIDs and the early implementation of preventive strategies and improve clinical outcomes.

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Science | 3: Infectiology – pneumology - immunology

Functional validation of a novel, homozygous RNU7-1 variant in Aicardi-Goutières disease

Aicardi-Goutières syndrome (AGS) is a type I interferonopathy presenting with early-onset encephalopathy, leukodystrophy, and basal ganglia calcification. AGS-associated genes encode proteins regulating nucleic acid sensing and metabolism. Recently, compound heterozygous mutations in RNU7-1, encoding the U7 small nuclear RNA, an essential U7 snRNP component, have been linked to AGS. Loss of U7 snRNP function causes malprocessing of replication-dependent histone (RDH) pre-mRNA and maladaptive cGAS-STING activation.

We describe two infants with failure to thrive and spastic hypertonia. Brain MRI showed frontotemporal leukodystrophy and cystic lesions, and CT revealed basal ganglia calcifications. Whole-blood RT-qPCR demonstrated an elevated type I interferon signature in both patients, with increased RSAD2, IFI27, IFI44L, IFIT1, SIGLEC1, and ISG15, confirming AGS.

Exome sequencing identified a novel homozygous RNU7-1 variant (n.60C>G) in patient 1 (P1). Patient 2 (P2) carried the same variant in compound heterozygous state with a known pathogenic n.28C>T variant. The significance of n.60C>G was unclear because no homozygous RNU7-1 variants have been linked to AGS, an alternate substitution at the same site (n.60C>T) occurs homozygously in the general population and is classified likely benign, and in-silico modelling predicted no major differences in stem–loop stability between both variants.

To address this, we performed functional assays on primary skin fibroblasts. RT-qPCR showed increased expression of RDH histones HIST1H1C and HIST1H2AC in both patients, consistent with confirmed AGS cases carrying compound heterozygous RNU7-1 variants. Fibroblasts from all patients with biallelic RNU7-1 variants also showed increased RSAD2 and IFI27 expression.

In summary, we report the first AGS case caused by a homozygous RNU7-1 variant, n.60C>G, notable given the presence of a likely benign homozygous substitution at the same nucleotide (n.60C>T). Clinical phenotyping and in-vitro confirmation of RDH pre-mRNA malprocessing support the pathogenicity of n.60C>G, expanding the genotypic spectrum of RNU7-1-associated AGS. Increased ISG expression in fibroblasts of biallelic RNU7-1 patients further enables mechanistic and pre-clinical therapeutic studies.

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Science | 3: Infectiology – pneumology - immunology

Clinical outcomes and risk factors of severe Influenza in children under 18 years: analysis of hospital surveillance data

Introduction
Influenza is a significant cause of severe respiratory illness in children, leading to substantial hospitalisations. In Belgium, a network of nine hospitals monitors hospitalisations for severe acute respiratory infections (SARI), including due to influenza. This study aimed to assess the burden of disease and identify risk factors associated with severe influenza among children.

Method
We conducted a retrospective analysis of paediatric (<18 years) SARI cases with laboratory-confirmed influenza. The study period spanned from 13 November 2023, corresponding to the implementation of a new paediatric SARI case definition, to 15 June 2025. Cases co-infected with RSV or SARS-CoV-2 were excluded.

Results
During the study period, 583 cases were recorded with a sex ratio M/F of 1.0. The median age was 2 years, 19.9% of cases were <6 months (<3 months: 13,0%) and 24,2% were between 6-24 months. The median length of stay was 2 days (min-max: 1-5).
Of the 516 children of which risk status was reported, 27,3% had at least one risk factor. The most prevalent were prematurity (n=39, 7,3%), asthma (n=28, 5,0%), neurological disorders (n=25, 4,5%), chronic respiratory disease (n=19, 3,4%) and a history of hospitalization for bronchiolitis (n=18, 3,5%). Of the 563 children of which complication status was completed, 16,9% presented a complication of which the most prevalent was pneumonia (n=44, 7,8%), febrile seizure (n=8, 1,5%) and ARDS (n=7, 1,2%). Twenty-two children (3,8%) were hospitalised in ICU of which 7 were <1 year (4 were <6 months) and 8 between 5 and 17 years old. Only 10 of them (45,5%) presented ?1 risk factors including 2 children with prematurity, 2 with neurological disorders, 2 with cognitive troubles and 2 with immunity deficiency.
An outcome was mentioned for 533 children: 97.7% fully recovered, 0,9% were left with sequelae and 1,3% were transferred to another hospital.
Vaccination was reported for only 14 children aged ?6 months; 12 had received the appropriate seasonal vaccine at least two weeks before symptom onset. All vaccinated children had at least one risk factor, and none required ICU admission.

Conclusion
Influenza affects mainly previously healthy children and the burden is particularly high among children ?2 years. These findings highlight the need to evaluate and strengthen preventive measures for children.

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Science | 3: Infectiology – pneumology - immunology

Suboptimal delays in measles diagnosis and testing in Belgium, 2025.

Despite routine vaccination, measles outbreaks still occur in Belgium, with high case numbers in 2024 and 2025. To interrupt transmission, case isolation, contact tracing and post-exposure prophylaxis need to be promptly deployed. Measles is therefore notifiable to the regional health authorities as soon as the diagnosis is suspected, without waiting for laboratory confirmation. We evaluated the completeness and timeliness of these notifications.

We looked at all measles notifications (MN) and tests performed at the national reference center (NRC) between 1/1/2025 and 31/10/2025 in Belgium. Information from both datasets (MN and NRC) was combined if the case was present in both datasets, as defined by same date of birth, postcode and sex. Date of onset was based upon self-reporting by the patient or notifying clinician. For testing, the date of sample collection was used. Boxplots and Wilcoxon Rank Sum test were used to evaluate potential differences in notification delays. Analyses were done in R v4.4.

A total of 390 measles cases were reported, of which 307 were lab-confirmed. 852 notified measles suspicions were discarded upon further investigation. For 179 cases in which the NRC ruled out measles, the suspicion had not been notified to the authorities. Median delay between symptom onset and notification was 6 days (IQR = 4-8d, info available for 295 cases). Median delay between symptom onset and testing was 4 days (IQR 3-6, info available for 172 cases) and between testing and notification 1 day (IQR 0-3, info available for 181 cases). Notification delay did not change over time or for symptom onset during the weekend but was slightly longer for older cases (median 6d vs. 5d for cases <12y old, p=0.02).

The high number of notified discarded cases indicates good sensitivity of the surveillance system. However, the additional 179 discarded cases not reported to the health authorities show that not all clinicians are aware of the obligation to report every suspicion of measles. This is also shown by the delay between testing and notification, which is ?1 day for half of the cases with available info and even ?3 days for 25% of cases. The delay remained constant over time, despite awareness campaigns. The delay until testing is not unreasonable, since initial symptoms are aspecific. It does however limit the window for effective interventions, as contagiousness already starts 4 days before the apparition of the characteristic rash.

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Science | 3: Infectiology – pneumology - immunology

Emergence of the West Nile Virus in Belgium: Diagnostic Challenges, and Pediatric Issues

Introduction:

West Nile Virus (WNV) is primarily transmitted by mosquitoes of the genus Culex, which are native species in Belgium. This virus mainly spreads among bird populations, while humans and horses are considered accidental hosts. While it is a virus that rarely affects humans it can cause severe neurological disease such as encephalitis and meningitis, for which the etiological cause sometimes remains unknown in children.

Method/results:

In the 2025-summer, the veterinary surveillance system within the OH4 Surveillance project, detected the presence of WNV in several birds for the first time on Belgian territory (Mechelen, Hombeek, and Meise). In recent years, an increase in cases has been observed in Europe, and the disease is endemic in certain regions. where hundreds of cases are reported each year.
This findings were therefore communicated to public health authorities to warn and inform doctors about the risk of encountering this infection.

Discussion:

WNV is responsible for a febrile illness associated with headaches, myalgia, nausea, vomiting, fatigue, rash, and eye pain. In general population, 80% of cases of the disease is asymptomatic. However, about 1% of patients develop neurological disease, with a mortality rate of around 17%. There is currently no specific treatment, but symptomatic treatment should be applied. No vaccine is yet available against WNV. It is crucial to expect the emergence of this disease in pediatric patients, particularly to recognize severe or neurological forms of the illness. Diagnosis is mainly made indirectly by serology on blood or CSF, and less often directly by PCR on CSF, blood, serum or urine.

Conclusion:

Climate change will lead to an evolution of the diseases we will face. It is essential to inform the population, and to strengthen measures to monitor and control vectors, as well as protections against mosquito bites. In the case of WNV, precautions must also be taken in the management of blood products to limit the risk of transmission.

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Science | 4: Gastroenterology – nutrition

Management of pancreas divisum in children: A review and case series

Background: Pancreas divisum (PD) is a congenital malformation of the pancreatic ductal system and is frequently identified in children with acute recurrent pancreatitis (ARP) or chronic pancreatitis (CP). Evidence on pediatric PD management remains limited and heterogeneous.

Objective: To summarize the available literature on the management of PD in children and to describe institutional experience from a retrospective case series at University Hospitals Leuven.

Methods: A narrative literature review was performed according to PRISMA-S guidelines, including studies (2000–2025) reporting management outcomes in patients <18 years with PD. In parallel, a retrospective chart review was conducted of all children diagnosed with PD between 2000 and 2024. Data on presentation, diagnostics, interventions, and follow-up were collected. Clinical success in the case series was defined as ?50% reduction in annual pancreatitis episodes, and changes in median incidence before and after therapeutic ERCP were statistically assessed.

Results: Fourteen studies involving 268 pediatric PD patients were included. Eleven studies reported ERCP outcomes (n=230), with clinical success rates of 50–100% and complete symptom resolution of 0–100%. Three studies described surgical management (n=19), with clinical success of 50–100% and complete resolution of 0–33.3%. Descriptive aggregation of raw patient numbers suggested symptomatic improvement in a substantial proportion of children across both ERCP and surgical cohorts, although heterogeneity limited comparability. The institutional cohort included nine patients. Eight underwent ERCP and seven received therapeutic interventions (43 procedures). Technical success was 93%. Among the seven therapeutically treated children, the median incidence of pancreatitis episodes decreased from 1.7 to 0.8 per year (62% reduction), a statistically significant change (p = 0.016). Clinical success was achieved in 5 of 7 patients (71%), and complete resolution in one (14%).

Conclusion: Current evidence and our institutional experience suggest that ERCP may reduce pancreatitis burden in selected children with PD, although complete resolution remains uncommon. Surgery is less frequently reported and mainly reserved for refractory cases. The scarcity of pediatric data, particularly the absence of randomized trials, and heterogeneous outcome definitions underline the need for standardized measures and prospective studies to guide management.

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Science | 4: Gastroenterology – nutrition

Prebiotic and probiotic use in healthy infants and toddlers: a survey of parental knowledge, consumption patterns and perceived benefits

Introduction: Parents often introduce prebiotic and probiotic products into their infants' and toddlers' diets assuming potential health benefits. Misconceptions and limited evidence-based knowledge may contribute to inappropriate use or unrealistic expectations. This survey aimed to investigate parental awareness, understanding and use of prebiotic and probiotic products in children aged 0–3 years.

Methods: We performed a cross-sectional study in Belgium. Recruitment of parents was conducted both face-to-face and online via social media platforms. The survey assessed demographic characteristics, dietary habits, knowledge, use, parental attitudes and perceptions regarding pre- and probiotics.

Results: A total of 588 parents (mean age 33.1 ± 2.0 years) completed the survey, of whom 363 (61.7%) participated through social media. Most respondents were familiar with the term probiotics (90.5%), while 57% reported familiarity with prebiotics. 18.9% of parents administered a daily supplement or formula containing pre- or probiotics to their children. Correct identification of the evidence-based effect of pre- and probiotics was achieved in 43.1% and 45.9% of cases, respectively. In 40.8 % of cases, healthcare professionals recommended pre- or probiotic supplements for the treatment of a disease. Pediatricians were the primary prescribers (n=128, 53.8%). 36.4% of parents reported receiving such recommendations for preventive purposes, most commonly from pediatricians (n=80, 44.7%).

Discussion: Belgian parents participating in our survey were familiar with pre- and probiotics but less than half correctly identified their proven effect. This underscores the need for clearer guidance from healthcare professionals.

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Science | 4: Gastroenterology – nutrition

Crohn’s Disease Exclusion Diet + Partial Enteral Nutrition as induction treatment in paediatric Crohn’s Disease

Background & Aims:
The Crohn’s Disease Exclusion Diet (CDED) combined with Partial Enteral Nutrition (PEN) is increasingly used to induce remission in children with mild-to-moderate Crohn’s disease (CD), yet real-world data on its effectiveness and tolerability remain limited. This study assesses the short- and long-term outcomes of CDED + PEN in a Belgian paediatric CD cohort.

Methods:
A retrospective cohort study was conducted at a tertiary paediatric inflammatory bowel disease centre. Clinical and biochemical parameters were recorded during induction and at one-year follow-up. Relapses and treatment changes were documented over a minimum two-year period. Long-term outcomes were compared with those of patients initially managed with corticosteroids.

Results:
Eighteen patients began CDED + PEN at diagnosis. Six (33%) discontinued during phase 1 due to poor tolerability. Of the remaining 12, nine (75%) achieved clinical and biochemical remission by the end of phase 1. Eleven patients (61%) completed the diet through phase 2. Two relapses occurred during phase 2, neither requiring corticosteroids. Weight z-scores improved significantly by week 18 ($p = 0.02$). At one year, 64% remained in corticosteroid- and biologic-free remission. Compared with corticosteroid-treated patients, those on CDED + PEN showed a trend toward delayed initiation of anti-TNF-? therapy.

Conclusion:
CDED + PEN is an effective induction therapy for paediatric mild-to-moderate CD when tolerated. Relapse risk may increase during food reintroduction, warranting close follow-up. Compared with corticosteroid-based treatment, CDED + PEN appears associated with a more favourable early disease course, including reduced need for early biologic escalation.

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Science | 4: Gastroenterology – nutrition

Retrospective analysis of clinical and immunological characteristics in pediatric IBD and the occurrence of IEI: to screen or not to screen?

Background: Inflammatory bowel disease (IBD)—including Crohn's disease, ulcerative colitis and IBD-unclassified—is a chronic inflammatory disorder of the gastrointestinal tract with a rising incidence in children worldwide. Recent insights have highlighted the role of primary immunodeficiencies, or inborn errors of immunity (IEI), as a contributing factor in a subset of pediatric IBD cases. Monogenic forms of IBD, caused by single-gene defects affecting immune regulation, epithelial barrier function or microbial defense, are increasingly recognized across the pediatric age spectrum. Early identification of these underlying disorders is essential, as they are often associated with significant morbidity and may require specific therapeutic strategies. To support timely recognition, ESPGHAN guidelines recommend evaluating pediatric IBD patients for IEI when "red flag" features are present, such as very early onset, positive family history, therapy-refractory disease or atypical extraintestinal manifestations. However, these guidelines are not always clearly defined or easily usable in practice and screening is not consistently implemented across centers.
Objectives: We aim to investigate the prevalence and clinical characteristics of IEI in children and adolescents with IBD at our center and to examine clinical, laboratory and demographic features most predictive of underlying IEI. The study also evaluates the diagnostic yield of immunological screening, adherence to current guidelines and the utility of systematic immune evaluation, with the goal of identifying gaps, reducing diagnostic delays and optimizing patient care.
Methods: This retrospective study includes all pediatric patients (0–17 years) with a diagnosis of IBD who are followed at the Department of Pediatric Gastroenterology, University Hospital Ghent. Data will be extracted from medical records and include demographic variables, personal and family medical history, treatment regimens, laboratory parameters and genetic findings. Patients with a follow-up duration <3 months will be excluded. Descriptive statistics will be used to summarize the clinical, immunological and demographic characteristics of the study population.
Relevance: The findings are expected to inform standardized screening pathways, support targeted and personalized diagnostic approaches and enhance guideline-concordant care in pediatric IBD.
Results: Data collection is ongoing and results will be presented in March 2026.

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Science | 5: Oncology – hematology

Daily Life Perspective on fatigue in childhood cancer survivors: An Experience Sampling and Wearable Study

Background: Although fatigue is a well-documented late effect in childhood cancer survivors (CCS), its day-to-day and momentary fluctuations in daily life are not well understood. This study examined within-person fluctuations in general and cognitive fatigue, focusing on emotional tension, prior fatigue, sleep, and physical activity as predictors. Methods: Seventy-eight CCS (median age = 18.6 years) participated in five 7-day experience sampling bursts over one year, completing seven daily smartphone assessments on fatigue and emotional states. Fitbit devices provided continuous data on nightly sleep and steps in the two hours prior to each prompt. Multilevel mixed-effects models tested within- and between-person associations, including moderation by cardiorespiratory fitness (VO?peak). Results: Participants completed 12345 assessments across the year. About 30% of the variance in fatigue was between-person, while 70% was within-person. Higher fatigue at one assessment predicted higher subsequent fatigue, indicating inertia (general: b=0.44,p<.001; cognitive: b=0.19,p<.001). Higher tension predicted higher subsequent fatigue (general: b=0.08,p<.001; cognitive:b=0.07,p<.001). Sleeping longer than one's average predicted lower next-day fatigue (general: b=–0.10,p<.001; cognitive: b=–0.05,p<.001). Physical activity in the preceding two hours was linked to higher momentary general fatigue (b=0.07,p=.001) but lower cognitive fatigue (b=–0.02,p=.042). General fatigue showed a quadratic increase across the day, accelerating later in the afternoon (b=0.22,p=.028). VO?peak did not significantly predict fatigue overall, but patterns suggested a buffering role against activity-related increases in general fatigue. Conclusion: Although fatigue is a persistent late effect in CCS, it shows marked momentary fluctuations driven by prior fatigue, emotional states, sleep duration, physical activity, and time of day. Intensive longitudinal monitoring offers unique insights into proximal drivers of fatigue and may guide personalized management strategies, including pacing, optimized scheduling, and tailored activity prescriptions.

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Science | 5: Oncology – hematology

Determinants of low cardiorespiratory fitness in childhood cancer survivors: a cross-sectional study

Introduction: Childhood cancer survivors (CCS) frequently present with impaired cardiorespiratory fitness (CRF). We compared limiting factors of CRF between CCS and healthy controls (HCs) and aimed to identify determinants of low CRF in CCS.
Methods: We studied 76 CCS (0.5-10 years after chemo- and/or radiotherapy) and 76 matched HCs (median age 18.2(5.4) vs 18.8(5.9) years,p=.104). All individuals performed a cardiopulmonary exercise test (CPET) until volitional exhaustion on a treadmill to determine peak oxygen uptake (VO2peak). Cardiovascular-, pulmonary- and peripheral limiting factors were assessed as follows: cardiac output and shear wave velocities (SWV) (marker of myocardial stiffness) using conventional- and high frame rate echocardiography; breathing reserve (BR), defined as 1-(maximal ventilation/maximal voluntary ventilation), during CPET; forced vital capacity (FVC) and forced expiratory volume in 1 second (FEV1) via spirometry; maximal isometric quadriceps strength with a Forceframe device and functional lower limb strength by Timed up-down-stairs (TUDS) and 30 second sit-to-stand (30sts). Between-group comparisons and stepwise linear regression analyses were performed.
Results: CCS had lower VO2peak than HCs (35.4±6.9 vs 44.2±6.9 ml/kg/min,p<.001). Compared with HCs, CCS also had lower cardiac output (3.5±.7 vs 3.9±.8 l/min,p=.033), higher SWV (3.9±0.7 vs 3.3±0.3 m/s,p<.001), higher BR (34.39±13.1 vs 29.0±10.7 %,p=.007), lower FVC (4.0±1.0 vs 4.5±1.0 l,p=.002) and lower FEV1 (3.4±0.8 vs 3.8±0.9 l,p=.005). CCS had lower quadriceps strength (200.7±66.7 vs 235.4±75.1 N,p=.018), were slower on TUDS (6.0±1.3 vs 5.1±0.8 s,p<.001) and performed fewer repetitions on the 30sts (15±5 vs 19±4,p<.001) compared to HCs. After adjustment for age and sex, SWV (?=-.41,p=.002) and TUDS (?=-.35,p=.006) were identified as independent predictors of VO2peak (F(4, 37)=12.91,p<.001), together explaining 53.7% of the variance in VO2peak among CCS.
Conclusion: Cardiorespiratory fitness in CCS is limited by cardiac and peripheral factors. Future exercise interventions to improve CRF in CCS should therefore target both cardiac and peripheral determinants of CRF in CCS.

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Science | 5: Oncology – hematology

Hitting the menin switch to enable drug repurposing in pediatric sarcoma

Disruption of the KMT2A (MLL)–menin interaction has revolutionized the treatment of pediatric leukemias with KMT2A rearrangements. Recent discoveries now implicate menin inhibition in Ewing sarcoma, where it cooperates with the EWS–FLI1 fusion protein to reprogram transcriptional and metabolic networks, suggesting a broader oncogenic role across fusion-driven tumors.
In a 9-year-old boy with relapsed PAX3–FOXO1 fusion-positive rhabdomyosarcoma (RMS), we identified multiple KMT2A aberrations. High-throughput screening of the tumor cells with 79 compounds revealed sensitivity to navitoclax, suggesting potential synergy with menin inhibition, a combination previously reported in acute myeloid leukemia. Functional validation confirmed potent inhibitory effects of the menin inhibitor ziftomenib and navitoclax in ex vivo patient-derived RMS cells and in vivo, where combination therapy significantly delayed tumor progression in the fusion-positive PDX model with KMT2A aberrations.
Transcriptomic profiling performed 48 hours following menin inhibition revealed robust downregulation of KMT2A and PAX3–FOXO1 target genes, alongside upregulation of cholesterol metabolism pathways, an adaptive response previously observed in colorectal cancer. Expanding our analysis, we identified additional RMS cases with KMT2A aberrations, all of which showed sensitivity to menin inhibition. In contrast, fusion-negative RMS cases lacking KMT2A did not respond to menin blockade, while fusion-positive RMS without KMT2A alterations remained sensitive. Across all four RMS subgroups, combined menin–navitoclax treatment resulted in strong Bliss synergy scores, indicating a robust synergistic drug interaction.
We are currently extending these studies to additional ex vivo and in vivo models to refine mechanistic insights, identify predictive biomarkers, and test whether this therapeutic strategy can be expanded to other pediatric sarcoma models, including Ewing sarcoma.
Together, our findings highlight menin inhibition as a key therapeutic vulnerability across fusion-driven pediatric sarcomas. Integrating genomic profiling with functional drug testing unveils actionable dependencies, paving the way for precision medicine in rhabdomyosarcoma and other pediatric sarcomas, including Ewing sarcoma.

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Science | 5: Oncology – hematology

The “PEN-POOT” project: a letter exchange programme between children with cancer and ill pets

Introduction: Children with cancer endure significant psychosocial distress and isolation, yet infection risks often limit the use of Animal-Assisted Therapy (AAT) in paediatric oncology. Virtual AAT (VAAT) offers a safe alternative. This study evaluated the “PEN-POOT” project, a VAAT letter-exchange program connecting paediatric cancer patients with pets facing similar health challenges. The primary aim was to examine how this shared medical context supported children’s psychological well-being, with a focus on emotional support and connectedness. Additionally, we explored the experiences of the pet owners involved.
Methods: In this qualitative study, 17 paediatric oncology patients (aged 7–17) participated in a longitudinal letter exchange with ill pets. Pet owners facilitated the process by writing from the animal's perspective. Data were collected through semi-structured interviews with both children and owners at baseline, interim, and post-intervention. Transcripts and letters were analysed using inductive thematic analysis to identify psychosocial outcomes and experiences.
Results: Four central themes emerged for the children: connectedness, distraction, emotional impact, and imagination. The programme primarily served as a "therapeutic respite" and neutral distraction from the medical reality, rather than an outlet for processing illness-related emotions. For the pet owners, participation provided a sense of purpose, reciprocal support, and an opportunity to process their own animal’s illness. However, practical execution faced challenges: a high organisational burden and the unpredictability of hospital life, combined with varying patient motivation, led to low intervention fidelity and high dropout rates.
Discussion: PEN-POOT constitutes a safe and meaningful VAAT intervention. Its primary value lies in offering neutral distraction and imaginative engagement without infection risks. Despite these benefits, the high organisational burden challenges its sustainable implementation in a busy clinical setting. Our findings suggest that the intervention is most impactful for patients during periods of intensive hospitalisation. Future efforts should focus on developing a more efficient delivery model to maximise its benefits for this specific population.

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Science | 5: Oncology – hematology

Long-term impact of adjuvant cancer treatments on neurocognitive development in paediatric brain tumour patients: A six-year longitudinal study

Paediatric brain tumour survivors frequently experience cognitive difficulties affecting their quality of life. Both the disease and treatment can cause brain injury during critical neurodevelopmental stages, resulting in long-term neurocognitive impairments that persist into adulthood. This study investigates longitudinal changes in cognitive developmental trajectories in paediatric brain tumour patients and evaluates the impact of adjuvant cancer treatments on patient outcomes.

A comprehensive longitudinal neurocognitive assessment was conducted in 129 paediatric brain tumour patients (ages 0-18 years) treated at University Hospitals Leuven between 2011 and 2025. Standardized assessments were administered shortly after diagnosis (before adjuvant therapy) and biennially up to 6 years post-diagnosis. Eleven cognitive functions spanning intellectual, attentional, executive, visual-motor, and processing speed domains were assessed and converted to age-normed z-scores. Adjuvant treatment was categorized as chemotherapy only (11%), radiotherapy only (12%), and combined chemo-radiotherapy (29%). For each cognitive function, linear mixed-effects models were used to evaluate longitudinal trajectories and adjuvant treatment effects, adjusting for sex, age at diagnosis, tumour type, and surgical resection.

Significant cognitive decline was observed in verbal reasoning, visual perceptual discrimination, visuomotor integration, focused attention, sustained attention, and processing speed (? = -.10 to -.28 per 2 years, ps < .05). Compared to no adjuvant treatment, chemotherapy-only patients showed steeper declines in cognitive flexibility (? = -.57, p = .02), and radiotherapy-only patients showed steeper declines in focused attention (? = -.51, p = .04). Combined chemo-radiotherapy patients showed steeper declines in verbal reasoning (? = -.41, p = .02) and perceptual reasoning (? = -.49, p = .02) compared to no adjuvant treatment, and steeper declines in visuomotor integration (? = -.65, p = .02) compared to radiotherapy only.

This study demonstrates progressive long-term cognitive impairment across multiple domains persisting beyond six years post-diagnosis, with the most severe outcomes observed in patients receiving combined chemo-radiotherapy. These findings emphasize the urgent need for integrated neurocognitive monitoring and early intervention to minimize cognitive impairment and improve the quality of life for paediatric brain tumour survivors.

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Science | 5: Oncology – hematology

Tracing Clonal Evolution of Single Cells at Relapse in High Hyperdiploid Acute Lymphoblastic Leukemia

Background: High hyperdiploid (HeH) B-cell acute lymphoblastic leukemia (B-ALL) is the most prevalent subtype of pediatric ALL. HeH B-ALL is generally associated with a more favorable outcome. However, due to its high incidence in children, it is responsible for 15%-25% of all relapses. Previously, we identified clonal heterogeneity in HeH B-ALL, leading to the hypothesis that more heterogeneity could lead to a higher risk of relapse. Therefore, we performed single-cell DNA and antibody sequencing (DAb-seq) in paired diagnosis-relapse cases with HeH B-ALL.

Methods: Bone marrow or peripheral blood samples of 9 patients with HeH B-ALL were collected at diagnosis and relapse. We performed targeted DAb-seq with the Mission Bio Tapestri Platform, using our custom amplicon panel of 414 amplicons across 39 commonly mutated genes and targeting 41 surface proteins, analyzing around 15 000 cells per sample.

Results: At diagnosis, we detected (sub)clonal mutations in all but one patient, ranging from 2 to 8 mutations per case. At diagnosis, at least one RAS mutation (KRAS or NRAS) was present, with multiple RAS mutations in 6/9 cases, confirming our previous findings that RAS mutations are omnipresent in HeH B-ALL at diagnosis. However, in relapsed cases, RAS-mutated (sub)clones emerged or persisted as the dominant clone in only half of the cases, either co-occurring with other mutations (CREBBP, PTPN11, NSD2) or independently. In other cases, RAS mutations were either lost or remained in small subclones. Furthermore, comparing the number of mutations and subclones in diagnostic samples from patients who did or did not relapse, we found a trend of a higher degree of heterogeneity in cases with later relapse.

Conclusion: In patients who relapse with HeH B-ALL, a noticeable level of clonal heterogeneity can be found at diagnosis. This includes RAS mutations, although these are not always the primary factor driving relapse. Our results suggest that a higher degree of heterogeneity at diagnosis could be a risk for later relapse in HeH B-ALL.

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Science | 5: Oncology – hematology

Benefits of a physical activity programme during paediatric haematology-oncology treatments

Introduction
Although the benefits of physical activity become more and more evident in oncology, cancer is still often associated with limited sporting activities in children. This is due to the disease, treatments and reduced stimulation at school or in sport clubs. In partnership with the school based in our hospital, we have set up the Gym&Joy programme to promote adapted physical activities for children undergoing cancer treatment. We evaluate the effect of this programme by comparing the physical abilities of the patients involved with the standards defined within the Federation of Wallonia-Brussels (FWB).
Methods
Since 2021, 53 children treated for cancer have participated in individual or group physical activities adapted to the hospital. Their abilities and skills were prospectively assessed according to the objectives and core competencies set by the FWB at the time of diagnosis, every 3 months during treatment, at the end of treatment, and one year later.
Results
20 girls and 33 boys were included in our analysis. The average age of the patients was 8.3 years (2-17 years), with 15 children educated according to the recommendation of pre-primary, 21 of primary, and 17 of secondary education standards. Among the diagnosis, 26 children were treated for leukemias, 8 for lymphomas, 6 for brain tumors, 3 embryonic tumors, 9 bone or soft tissues sarcomas and 1 for thyroid carcinoma. The average follow-up was 16.3 months (0-36 months), with 24 patients having completed their treatment including 19 with an assessement at 1 year later. In younger children (pre-primary) and children with central nervous system tumours, we observed an early decrease in motor and expressive abilities. This decline was also observed between 3 and 9 months after diagnosis in all patients with sarcoma. The relational aspects related to physical activities and sensitivity to health and safety tended to increase in the first few months of treatment but seemed to decrease slightly over time, particularly in adolescents and/or during prolonged maintenance treatment.
Discussion
This study shows that cancer and its subsequent treatment can result in a decline in physical abilities, particularly at the start of care or after surgery. It demonstrates that programmes promoting physical activity are feasible in hospital settings, even during treatment. When encouraged and stimulated in a appropriate manner, most children can regain the same skill levels expected of their peers.

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Science | 7: Cardiology

Cardiovascular features of patients with Williams-Beuren and isolated pathogenic variants in elastin

Introduction. Williams Beuren syndrome (WBS) is a microdeletion syndrome occurring in an estimated 1/10000 births, with repercussions on many organ systems, the most important being the neurodevelopmental problems, followed by the cardiovascular problems. The 1.5-1.8Mb deletion involves 22 single copy genes, with the ELN-gene responsible for the majority of the cardiovascular problems these individuals experience. Isolated pathogenic variants (PV) in the ELN-gene, responsible for elastin production, lead to similar cardiovascular problems as in WBS, but has little repercussions on other organ systems. The most frequent cardiovascular problems seen in ELN-arteriopathy (EA) are supravalvular aortic stenosis, supravalvular and peripheral pulmonary stenosis, aortic coarctation and coronary ostial stenosis.

Methods. Out of forty-two patients, thirty-five patients were considered suitable for our study aim, with sufficient follow up data. Patients were divided into groups based on whether they had any intervention and data was collected about echocardiographic parameters, interventions and epidemiology of our population. A comparison regarding cardiovascular problems will be made between the intervention and non-intervention group, as well as a comparison between WBS patients and patients with a PV in the ELN-gene.

Results. 71% of our population had WBS, 57% was male and the median age at diagnosis was 0.7 years with a median follow-up period of 7.9 years. Regarding cardiovascular abnormalities, 51% of our population had SVAS, 60% had pulmonary stenosis and 40% had aortic coarctation. Surgery rates were 67%, 19% and 43% respectively, with remarkable reintervention rates. The prognosis of pulmonary stenosis was more favorable, with spontaneous diminishing gradients in the vast majority of the non-intervention group. A diagnosis with non-syndromic EA was a risk factor for surgery, along with a significantly narrowed sinotubular junction.

Discussion. Patients with ELN arteriopathy experience a high rate of cardiovascular problems. Standardized care is not implemented sufficient yet, though interventions have a high success but remarkable reintervention rate. The first years after the diagnosis seem to be the most important, regarding evolution of the vascular stenoses and decisions regarding interventions. These first years should be further studied, along with more research towards non-syndromic EA.

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Science | 7: Cardiology

Left ventricular mass in children with extremely low birth weight is lower but more sensitive to increased blood pressure

Background:
Epidemiological evidence suggests higher rates of heart failure in adults born at an extremely low birth weight (ELBW). Reports on the echocardiographic phenotype in this population are inconsistent and do not consider the effect of modifiable contributors such as blood pressure.

Methods:
This study reports on the echocardiographic findings of the PREMATCH study, a prospective case-control study evaluating renal and cardiovascular outcomes in children with ELBW in comparison to term-born controls. Left ventricular (LV) mass was the primary outcome. Data were analyzed with multivariable-adjusted regression models considering anthropometric variables and systolic blood pressure as covariates.

Results:
Eighty cases (median age, 10.8 years) and 72 controls (median age, 11.4 years) were included. Multivariable-adjusted analyses revealed that the adjusted difference in LV mass in cases versus controls was ?8.49 g (CI, ?13.78 to ?3.20; P=0.002). Sex, height, weight, and body fat percentage were significant covariates. There was a positive interaction between ELBW status and systolic blood pressure (Pinteraction=0.039). There was a ?6.47 g (CI, ?11.7 to 1.28; P=0.016) difference in LV mass between normotensive cases and controls, while the difference disappeared between subjects with increased blood pressure or hypertension.

Conclusions:
ELBW children exhibit lower LV mass during childhood in comparison with term-born controls. However, elevations in systolic blood pressure are associated with a steeper increase in LV mass in cases than in controls. Our findings question whether cutoffs for the general population are adequate to evaluate and manage hypertension and LV hypertrophy in children with ELBW.

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Science | 7: Cardiology

Joining forces for better paediatric cardiac care: establishment of a national registry for congenital heart disease and inherited cardiac conditions

Background: National and international collaboration for rare conditions is of the utmost importance for improvement of patient care, scientific knowledge and public awareness. Large multicentre registries often form the backbone for these collaborations. Till date, systematic and centralized registration of paediatric patients with Congenital Heart Disease (CHD) and Inherited Cardiac Conditions (ICC) across experts centres in Belgium is lacking, hampering multi-centre research, collaboration and identification of potential patients for clinical trials. Methodology: All major expert centres in Belgium and Luxembourg joined forces to establish a multi-centre registry for rare CHD and ICC. The initiative named, 'The Belgian Paediatric Cardiology Registry' (BePCaR) is endorsed by the Research Working Group (RWG) of the Belgian Association of Paediatic Cardiology (BAoPC). Different research projects, initiated by members of the BAoPC, will be accommodated to improve crucial knowledge gaps. Results: As Rome wasn't built in one day, neither was the BePCaR; several hurdles were to be overcome. Initially, a consensus on the governance of a centralised REDCap database was to be found within the RWG of the BAoPC. Given easier maintenance, data control, and robustness for future changes in comparison with a federated system. Secondly, establishing a legal and ethical framework – by extensive discussion with different ethical committees and legal units. Whereas, this framework is currently lacking in Belgium and Europe. Lastly, constructing a multi-usage REDCap database according to the FAIR-principles. Not only findability and accessibility are assured – by using an open REDCap server. But also interoperability and reusability will be guaranteed by consistent data coding and automated data transformation, empowered by collaborating with local statistical and technical experts. Fostering opportunities for sharing and interchanging data with other international initiatives, because only by working together paediatric cardiac care will keep on advancing. Conclusion: In order to improve lifelong outcomes of paediatric heart patients further data-driven insights are needed. A multi-centre collaboration with involvement of different legal, ethical an technical parties was established. From 2026 onwards, patient data will be collected. Hence, the BePCaR platform will be crucial for ongoing improvements in clinical and scientifical outcomes for paediatric patients globally.

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Science | 7: Cardiology

Prognostic Value of Third Trimester Echocardiographic Parameters in Fetuses Referred for Asymmetric Four-Chamber View

Background: An asymmetrical four-chamber view on prenatal echocardiography often raises suspicion of small left heart disease, a spectrum ranging from coarctation of the aorta (CoA) to hypoplastic left heart syndrome (HLHS). Accurate prenatal risk stratification remains challenging but is essential for optimizing perinatal management and improving outcomes.

Objective: To evaluate the predictive value of third-trimester fetal echocardiographic parameters in identifying fetuses referred for an asymmetrical four-chamber view who require postnatal cardiac intervention.

Methods: We conducted a retrospective single-center cohort study, including 100 fetuses referred for an asymmetric four-chamber view between 2013 and 2022. All included patients had a third-trimester fetal echocardiography (26–34 weeks gestation). Fetuses with more complex congenital heart defects were excluded. Echocardiographic measurements and Z-scores were compared between those requiring intervention (n=16) and those who did not (n=84).

Results: Sixteen fetuses (16%) required postnatal cardiac intervention. The aortic valve (AoV) Z-score, aortic-to-pulmonary valve ratio (Ao/AP) and the left carotid-to-left subclavian artery (LCA-LSA) distance were significantly associated with intervention ($p < 0.001$, $p < 0.001$, and $p = 0.048$, respectively). AoV Z-score and Ao/AP ratio showed strong predictive performance (area under the curve (AUC) = 0.857 and 0.881, respectively). We selected cut-off values prioritizing high sensitivity (100%): Ao/AP <0.57 and AoV Z-score <0.48.

Conclusion: The AoV Z-score and Ao/AP ratio are strong prenatal predictors of postnatal cardiac intervention in fetuses with an asymmetrical four-chamber view. Although specificity is limited, these simple measurements may help optimize delivery planning and reduce unnecessary neonatal intensive care unit (NICU) admissions.

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Science | 8: Nephrology

Optimizing Care and Education for Nephrotic Syndrome: Evaluation of an Innovative Care Pathway

Introduction:Idiopathic nephrotic syndrome (NS) is the most common glomerular disorder in children, characterized by nephrotic-range proteinuria, hypoalbuminemia and edema. The incidence ranges from 1 to 17 per 100,000 children per year, with an incidence of approximately 2 per 100,000 in Belgium. Most patients respond to corticosteroids within 4–6 weeks, but 70–80% relapse, and about half develop frequent relapses or steroid dependence. Management requires intensive follow-up, medication adherence, home monitoring and dietary measures, all of which significantly affect daily life. Adherence is particularly challenging in adolescence, with non-adherence reported up to 50%. Large variation is observed in knowledge and engagement of patients and parents, influenced by factors such as communication, education, involvement of multiple caregivers and language barriers. Educational interventions can improve motivation and adherence. In 2025, the pediatric nephrology team at Ghent University Hospital (UZ Gent) developed a structured multidisciplinary care pathway to improve uniformity of care. This study examines the effect of implementing a NS care pathway with an educational webinar at UZ Gent on patient and parent satisfaction with care quality and disease-related knowledge. Methods:This prospective cohort study was approved by the Ethics Committee of UZ Gent. Recruitment occurred from August to November ‘25. Eligible participants are Dutch-speaking parents of children (2–18 years) with steroid-sensitive NS with frequent relapses. Children aged 8–18 years may also participate. Exclusion criteria are congenital/infantile NS (<1 year) and steroid-resistant NS. Participants are identified via the electronic patient record and receive a flyer with a QR link to a REDCap survey. After consent, demographic and clinical data are collected along with questionnaires on satisfaction with care, PEDsQL and NS-related knowledge. Participants then access an educational webinar. The same questionnaire is repeated after 6 months. Data will be analyzed using SPSS. Expected results:We expect increased satisfaction with care and higher knowledge levels and insights into needs, barriers and improvement opportunities. The study aims to support optimization of care and treatment adherence for children with NS. Discussion:Care pathways may enhance standardization, communication and patient engagement. This study assesses whether a care pathway with education improves care at UZ Gent.

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Science | 9: Endocrinology

Hyperprolactinemia in children: the basics

Background: Hyperprolactinemia in children is an uncommon yet clinically relevant endocrine disturbance characterized by serum prolactin levels exceeding age- and sex-adjusted reference ranges. Prolonged hyperprolactinemia can have a negative impact on pubertal development, peak bone mass attainment, and growth in children.
Etiology: Physiological variations caused by stress, circadian rhythm, or postprandial increase must be ruled out. Confirmed paediatric hyperprolactinemia can be the result of various underlying causes, including pituitary adenomas (e.g. prolactinoma) as well as other lesions of the hypothalamus or pituitary stalk, due to the loss of dopaminergic inhibition. In addition, primary hypothyroidism or severe renal insufficiency can cause elevated prolactin levels. Also, drug-induced hyperprolactinemia caused by antipsychotics, selective serotonin reuptake inhibitors (SSRIs) and antiemetics is of increasing importance in children.
Clinical manifestations: Clinical manifestations vary by age, pubertal status and sex. Many symptoms are the result of inhibition of the gonadotropic axis by elevated prolactin levels. Prepubertal children may present with growth failure and delayed puberty and/or bone age. In adolescents, pubertal and reproductive effects dominate, such as amenorrhoea, oligomenorrhoea, galactorrhoea and gynaecomastia.
Diagnostic evaluation: Diagnostic evaluation starts with confirming hyperprolactinemia on a fasting, morning blood sample. Analytical interferences such as macroprolactinemia must be ruled out. After confirmation, a detailed assessment of medications, thyroid and renal function as well as other hypopituitary axes is necessary. An MRI of the pituitary-hypothalamus region is indicated in cases of markedly high prolactin levels, in the presence of neurological symptoms, if other pituitary axes are abnormal, and/or when no other cause can be identified.
Approach: The approach varies depending on the etiology. In case of secondary hyperprolactinemia, it is essential to address the underlying cause (e.g., thyroid hormone replacement or discontinuation of causative medication). Dopamine agonists are the first-line therapy for prolactinomas, they reduce the size of the tumor and lower prolactin levels.
Conclusion: Basic knowledge of hyperprolactinemia is essential for early recognition and appropriate treatment in order to prevent long-term consequences on growth, puberty development, and peak bone mass acquisition.

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Science | 9: Endocrinology

Growth patterns and bone maturation in girls and boys with 45,X/46,XY sex chromosomal DSD

Background/Aims: Differences of Sex Development (DSD) due to 45,X/46,XY mosaicism are rare sex chromosomal conditions associated with wide variation in phenotype, growth, and pubertal development. Both girls and boys with this karyotype frequently exhibit short stature, similar to girls with Turner (45,X) syndrome, yet growth patterns and bone maturation may differ between sexes. While female growth charts are routinely applied in Turner syndrome, it remains unclear whether male or female references more accurately reflect longitudinal growth and final height in individuals with 45,X/46,XY DSD. This study aimed to assess growth and bone age progression in both sexes, and to identify which sex-specific standards most accurately predict final height.
Methods: This multicentre retrospective cohort included 95 participants with 45,X/46,XY DSD from 26 centres. Longitudinal growth data were available for 54 cases, stratified by external genitalia score (EGS): Group 1 (EGS 0–4) and Group 2 (EGS 4.5–12). Height SDS was calculated using both male and female references. Serial bone ages were centrally reassessed using the Greulich & Pyle method. Predicted adult height (PAH) and target height (TH) were compared with near-final height (nFH). Outcomes of recombinant human growth hormone (rhGH) treatment were analysed.
Results: Mean nFH was 156.9 cm in Group 1 and 161.2 cm in Group 2. Growth followed female reference curves more closely, with nFH corresponding to –1.5 SDS (Group 1) and –0.8 SDS (Group 2) on female charts, versus –2.6 and –2.0 SDS on male charts. Bone age appeared delayed using female standards but advanced using male standards in both groups. Female-based PAH slightly underestimated, and male-based PAH slightly overestimated nFH. PAH better predicted nFH than TH. Overall, female-based PAH offered the best nFH prediction. nFH did not differ significantly between rhGH-treated and untreated participants, though interpretation is limited by small numbers and treatment bias.
Conclusion: In both sexes with 45,X/46,XY DSD, female growth charts and bone age standards best reflect actual growth and maturation and provide the most accurate prediction of adult height. Larger prospective studies are required to optimise growth assessment and management.

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Science | 9: Endocrinology

A study of thyroid function, central and peripheral thyroid hormone sensitivity and thyroid autoimmunity indices in boys with Klinefelter syndrome.

Introduction: Plasma fT4 levels in lower part of the reference range and a higher risk for thyroid autoimmunity are prevalent in adult men with Klinefelter syndrome (KS), but data in boys are limited. The aim of this study was to investigate plasma fT4 in boys with KS and to explore its relationship with indices of central and peripheral action of thyroid hormones, adiposity and thyroid autoimmunity.

Methods: 36 (9 prepubertal) boys with KS, aged between 7.2 and 17.6 years old, who had their annual health check at the UZ Brussel Klinefelter Clinic between 2023 and 2024, were included. Plasma fT4, TSH and anti-TPO antibodies were measured by the Cobas® 8000 e801 analyzer (Roche Diagnostics, Rotkreuz, Switzerland). The TSH index (or fT4-adjusted TSH) as a parameter of central sensitivity to thyroid hormones was calculated and plasma non-HDL cholesterol as marker of peripheral thyroid hormone action was measured. Adiposity was assessed by BMI z-score and waist/height ratio.

Results: Median (range) TSH was 1.850 (0.478-5.610) mIU/L, fT4 15.4 (10.2 – 19.5) pmol/L, TSH index 2.32 (1.59-2.97), non-HDL cholesterol 102 (64-162) mg/dL, and BMI z-score 0.07 (-2.42-2.51). One (pubertal) boy presented with low fT4 (10.2 pmol/L) and normal TSH, while another adolescent had slightly elevated TSH (5.610 mIU/L) with normal fT4. Anti-TPO antibodies were present in three adolescents but their thyroid function tests were normal. fT4 levels were in the lower half of the reference range in 33 (92%) participants and TSH index was below the reference median in 20 (56%) subjects. fT4 levels correlated positively with TSH index (r=0.675; p<0.001), and negatively with non-HDL cholesterol (r=-0.320; p=0.06) and BMI z-score (r=-0.325; p=0.05). Overweight (BMI
z-score>1.3) participants (n=13) had lower median [range] fT4 (14.3 pmol/L [12.0-16.8] vs 15.7 pmol/L [10.2-19.5]; p=0.05) and higher median [range] non-HDL cholesterol (111 mg/dL [64-162] vs 95 mg/dL [62-129]; p< 0.05).

Conclusions: While anti-TPO antibodies were detected after onset of puberty, fT4 reduction appeared in the prepubertal period and was more prevalent in overweight boys. The relationship of fT4 with non-HDL cholesterol confirms a normal peripheral sensitivity to thyroid hormones, while the strong association with TSH-index suggests a decreased thyrotropic function/increased central thyroid hormone sensitivity as underlying mechanism.

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Science | 10: Other - Quality of helathcare

Quality of care analysis using student submitted cases: lessons for medical schools and clinical tutors.

Introduction
Young doctors in training acquire extensive theoretical knowledge during their training, which they then put into practice during their internship. This brings them into contact with different hospitals, doctors, and diverse patient populations, each with distinct needs. This study examines where doctors in training report pitfalls or problems related to quality of care in our healthcare system.
Methods
A qualitative analysis was conducted using anonymous student-reported cases regarding quality of care. All anonymized cases underwent a three-stage inductive coding process: open, axial, and selective coding. This approach allowed the identification of key categories.
Results
The 600 cases were divided into specific categories: communication, the medical process, logistics/structure, and vulnerable patient groups. Young doctors primarily reported communication errors, both between healthcare workers themselves and between healthcare workers and patients or their loved ones. Most of these issues stemmed from verbal communication with inadequate or absent interaction. A smaller proportion involved language barriers. Students also noted frequent delays in healthcare delivery, particularly in establishing a diagnosis en initiating treatment (whether conservative, pharmaceutical, or more invasive). Because diagnostic delays inherently postpone treatment, special attention was given to delays occurring after a diagnosis had already been made. Fewer reports concerned reduced quality of care due bias against vulnerable patient groups or due structural and logistical deficiencies. These deficits mainly involved planning issues, such as staff shortages due high workloads and bed management.
Discussion
The perspectives of young doctors in training provide valuable insights into potential weakness in our healthcare system. The majority of the reported shortcomings relate to communication failures. Further research is needed to determine how these findings can be used for long-term improvements in healthcare quality.

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Science | 10: Other - Hepatology

Liver steatosis is highly prevalent in children with obesity in the PMOC population and is linked to muscle mass

Introduction: Pediatric metabolic dysfunction-associated steatotic liver disease (MASLD) is becoming increasingly prevalent, alongside obesity. In Europe, it is estimated that 30-50% of children living with overweight or obesity have MASLD. To treat children with obesity and comorbidities, pediatric multidisciplinary obesity centers (PMOC) were established in Belgium, where a multidisciplinary lifestyle intervention is provided.

Methods: Children (5 – 18 years) eligible for inclusion in PMOC were included between June and November 2025. Overweight and obesity were defined according to the WHO definition based on BMI z-score. Liver health was assessed using FibroScan, with liver steatosis defined as a controlled attenuation parameter (CAP) >248dB/m and fibrosis as liver stiffness by transient elastography (TE) >7kPa. Body composition including skeletal muscle mass was measured by bio-impedance spectroscopy (Bodystat Multiscan 5000).

Results: 91 children (54 girls) with a median age of 12 years were included (14% overweight, 86% obesity). Analysis was stratified by sex, as steatosis is more prevalent in boys and skeletal muscle mass development differs between sexes. 21 (57%) boys had liver steatosis and 8 (22%) had fibrosis, whereas 20 (38%) girls had steatosis and 8 (15%) fibrosis. For both sexes, BMI z-score and waist-to-height ratio were higher in the steatosis group. Girls with steatosis were significantly older (13.8y vs. 10.2y), this was not the case for boys (12.2y vs. 11.7y). Boys with steatosis had a higher median relative fat mass (43.8% vs. 38.3%, $p<0.001$) and concomitantly lower lean mass compared to the no steatosis group, as well as a lower relative skeletal muscle mass (29.41% vs. 37.7%, $p<0.001$). Girls had an equal relative fat and lean mass in both groups, but there was a lower relative skeletal muscle mass in the steatosis group (26.7% vs. 31.2%, $p=0.006$).

Discussion: Liver steatosis and fibrosis are prevalent health conditions in children with obesity in Belgian PMOC, occurring at a relatively young age. Children with steatosis have a higher BMI z-score, a higher waist-to-height ratio, and a lower relative skeletal muscle mass. These measures could help flag children at greater risk for liver steatosis in the PMOC setting without FibroScan access. These results highlight the interplay between liver and muscle health in children living with obesity, and support skeletal muscle mass increase as a key therapeutic goal.

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Science | 10: Other - Vaccination coverage

Rotavirus vaccination coverage in Belgium based on reimbursement data: trends and inequalities

Rotavirus vaccination has been recommended in Belgium since 2006. Previous studies showed stable yet lower uptake compared with other childhood vaccines (85% vs >90%), but recent coverage data are lacking. As it is the only recommended childhood vaccine not included in the free vaccination programs, financial barriers could influence uptake. This study provides an updated national estimate of rotavirus vaccination coverage based on reimbursement data and examines socio-economic determinants of under-vaccination.

Using reimbursement data from the InterMutualistic Agency (IMA), vaccination coverage per birth cohort was calculated for all children born between 2008 and 2022, and annual trends were assessed. Socio-economic and regional determinants of vaccination were evaluated using multinomial logistic regression with full vaccination as reference category. Collinearity among predictor variables was low and did not affect results.

The dataset included 43,876 children. In the most recent cohort (2022), 86.1% had received at least one dose and 79.5% were fully vaccinated. Overall coverage (at least one dose) remained stable over time. However, from 2020 onwards a shift emerged: full vaccination decreased by an average of 2.5%, and more children missed a dose. Financial vulnerability strongly predicted under-vaccination. Children with entitlement to increased reimbursement had 63% higher odds (OR 1.63; 95% CI 1.52-1.76) of being unvaccinated and 69% higher odds of receiving only one dose (OR 1.69; 95% CI 1.52-1.87). Each additional family member significantly increased the odds of incomplete vaccination by 14% (OR 1.14; 95% CI 1.12-1.16), and parental invalidity status was associated with 27% higher odds of being unvaccinated (OR 1.27; 95% CI 1.08-1.48). Marked geographical variation persists despite corrections for income and household size: compared with West-Flanders, children in Brussels, Walloon Brabant, and Namur had several-fold higher odds of being unvaccinated, with ORs of 4.62 (95% CI 4.02-5.30), 3.54 (95% CI 2.95-4.25), and 2.78 (95% CI 2.34-3.30), respectively.

These findings indicate that, although overall coverage has remained generally stable, it is not equal for all. Socio-economically vulnerable families and certain regions consistently show lower uptake. Inclusion of rotavirus vaccination in the free national immunization programs could remove remaining financial and logistical barriers and promote more equitable vaccine access.

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Science | 10: Other - Surveillance

Two decades of PediSurv: Insights from a pediatric surveillance for rare and severe diseases in Belgium.

The Pediatric surveillance network, PediSurv, has been monitoring several rare or severe infectious diseases in children under 15 years in Belgium since 2002. The network collects clinical information to determine risk factors and evaluate vaccination strategies. Additionally, it actively collects “zero case notifications” to monitor international eradication and elimination targets set by the Word Health Organization. Over the course of 20 years, the importance and purpose of the network has evolved significantly in the changing and expanding landscape of surveillance of infectious diseases. This study reviews current strengths and weaknesses of PediSurv and explores its future role within the Belgian surveillance systems.

We analyze trends between 2002 and 2023 for number of participants, coverage of pediatric hospitals and completeness of registrations. Based on initial study protocols and quality documents, we map the most impacting structural changes in the surveillance.

The number of active participants (reporting at least 6 months/year) declined from 526 in 2003 to 235 in 2023. Nevertheless, the proportion of pediatric hospitals (participating at least once a year) remained stable and even increased from 66% in 2003 to 74% in 2023, largely due to hospital mergers.
Registrations decreased over time, especially relative to registrations in co-existing surveillance systems. Despite this, PediSurv continues to provide additional detailed clinical information and remains the only source of zero notifications. Digitalization and implementation of General Data Protection Regulations had the greatest impact by severely limiting the simplicity and flexibility of the surveillance. This manifested as an increased complexity for participating physicians (e.g. due to cumbersome and changing log-in procedures) and the lost ability to rapidly include new pathogens due to rigid procedures, resulting in missed surveillance opportunities.

The surveillance landscape has drastically changed over the past 20 years, highlighting the need for existing systems to remain flexible and responsive. While options for automated data extraction are being investigated, manual reporting by clinicians still offers clear added value. To ensure long-term engagement it is essential to sustain the motivation of participating physicians by clearly demonstrating and communicating the public health impact of PediSurv and minimizing the reporting workload.

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Science | 10: Other - Pediatric Mental Health / Psychosocial Care

Mental Health Evolution between 2021-2024 and effect of an intensive residential program in children and adolescents with chronic conditions.

Introduction: WHO 2024 data show a rising mental health burden among youth. Chronic somatic conditions substantially increase the risk of emotional and behavioural disorders, making psychological well-being essential in holistic care. This study analysed mental health trends in children and adolescents with chronic somatic conditions admitted between 2021-2024 at Zeepreventorium and assessed the impact of the residential rehabilitation program.
Methods: Retrospective study of 975 patients aged 6–18y admitted between 2021-24 (mean age 13.9±2.7y), divided in two age groups: 6–11y (n=186; mean 9.6±1.4y) and 12–18y (n =789; mean 14.9±1.7y). Mental health was assessed at admission and discharge using Paediatric Quality of Life Inventory (PedsQL), Child Behaviour Checklist (CBCL), and Youth Self-Report (YSR, ?12y). PedsQL <80 indicates impaired quality of life (QoL); CBCL/YSR T-scores ?65 indicate clinically significant problems. Internalizing and externalizing scales were analysed separately. Data are presented as mean±SD or percentages; p<0.05 was considered significant.
Results: At admission, mental health burden was high. PedsQL scores showed severely impaired QoL, declining from 65±16 in 2021 to 56±13 in 2024 (p=0.022) in the 6–11y group. Across 2021-24, 89% of 6-18y patients had QoL<80 and 62% a CBCL internalizing score?65. In adolescents, the proportion with YSR internalizing scores ?65 rose from 28% in 2021 to 48% in 2024 (p=0.0023). Externalizing symptoms were less frequent; in 6–11-y-olds, CBCL externalizing ?65 increased from 35% to 44% (NS). The proportion meeting criteria for a behavioural/emotional disorder rose between 2021-24 from 35% to 47% in younger children (NS) and from 57% to 65% in adolescents (NS). During treatment, PedsQL improved significantly in both age groups, while CBCL and YSR internalizing scores decreased significantly, leading to a marked reduction in patients with a pathological score.
Conclusion: Baseline mental health in paediatric rehabilitation cohorts is poor and worsened between 2021-24, especially for internalizing symptoms in adolescents and externalizing symptoms in children. Intensive multidisciplinary residential care improves QoL and reduces emotional and behavioural problems, underscoring its psychosocial value alongside physical rehabilitation. These findings highlight the need to integrate mental health interventions into residential treatment for children and adolescents with chronic somatic conditions.

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Clinical case | 3: Infectiology – pneumology - immunology

A curious case of paediatric fever: following the rabbit trail

A 2-year-old boy without relevant medical history presented to the outpatient clinic with fever and flu-like symptoms. Five days prior to symptom onset, he noted a tick bite. Clinical examination revealed a scab at the bite site, but no clear infectious focus. His symptoms initially resolved with symptomatic treatment. One week later, he developed recurrent fever and right axillary lymphadenitis, for which empirical treatment with amoxicillin–clavulanate and oral azithromycin was initiated, the latter pending Bartonella serology. Ultrasound showed no abscess formation. After a three-day course of intravenous antibiotics, the lymphadenitis was less pronounced, and he was discharged with oral antibiotics. During therapy, fever recurred, and abscess formation in the affected lymph node was diagnosed, necessitating hospital readmission for surgical drainage and intravenous antibiotics. Panbacterial PCR of the abscess exudate identified Francisella tularensis, confirming the diagnosis of ulceroglandular tularemia. Tularemia is a rare zoonotic infection transmitted via vectors, such as ticks. The incidence is increasing in Belgium, though paediatric cases remain sparsely documented.
The patient completed a 14-day course of oral ciprofloxacin, initially resulting in a favourable clinical course. However, five weeks later, the patient experienced a relapse, marked by suppurative lymphadenitis, requiring repeat surgical drainage and a 14-day course of intravenous gentamicin. He ultimately recovered fully without sequelae.
This case highlights the importance of maintaining a broad differential diagnosis for lymphadenopathy in children and emphasizes the need for early recognition and targeted treatment of ulceroglandular tularemia to prevent prolonged disease course.

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Clinical case | 3: Infectiology – pneumology - immunology

A 10-Year-Old Boy with seizures and subcortical lesion : when neurocysticercosis is revealed by a convulsion.

Introduction
Parasitic infections of the brain remain a diagnostic challenge, especially in non-endemic countries and in the pediatric population, where they are rare. This report describes a case of neurocysticercosis in a child, underlining the diagnostic difficulties.
Case report
A 10-year-old boy, from Cape Verde, presented with a first episode of generalized tonic-clonic seizure. Symptoms included intense frontal headaches with nausea, followed by a tonic-clonic seizure, lasting around 15 minutes. No history of trauma, fever or recent infection in the patient or his relatives. Furthermore, his medical history was unremarkable and his vaccinations up to date.
At the emergency department, he was afebrile, with normal vital signs, clinical examination and laboratory tests. A second episode of generalized tonic-clonic seizure occurred, lasting less than 5 minutes. In the context of seizures without any clear etiology, he had a brain MRI which revealed a subcortical nodular lesion in the right angular gyrus, 8mm in diameter, with cystic components and T2 hyperintensity. An EEG was performed according to this finding and showed a paroxysmal focal activity in the right temporo-occipital area. The patient was started on carbamazepine and closely monitored.
The MRI findings were typical of a parasitic lesion such as neurocysticercosis. Despite the negative blood serology and the absence of visible scolex, the patient was treated with corticosteroids and albendazole.
The stool test revealed the presence of Hymenolepis nana eggs (unrelated), ophthalmologic examination and cerebrospinal fluid studies showed no significant abnormalities.
No further seizures occurred after the initiation of therapy.
Discussion
This case highlights the importance of considering parasitic infections such as neurocysticercosis in children with seizures, especially in regions where the condition is endemic, to avoid misdiagnosis with brain tumors and even avoid invasive tests as biopsy when diagnosis is typical.
The absence of further seizures at 6 months post-treatment suggests a positive outcome, but ongoing surveillance is essential to monitor potential complications.

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Clinical case | 3: Infectiology – pneumology - immunology

When a Routine Procedure Leads to an Unusual Swelling

Lumbar puncture is a common and essential diagnostic procedure in pediatric practice. It is usually safe, and complications are rare, particularly in infants younger than three months old. Among these, leakage of cerebrospinal fluid (CSF) is an uncommon event that is often benign and can easily be misdiagnosed. We report a case that illustrates this rare complication and its successful conservative management.

A 3-month-old infant underwent a lumbar puncture for suspected meningitis. Twelve hours later, a fluctuant swelling appeared over the lower back, progressively extending to the upper back, with its location shifting over short intervals, consistent with migrating subcutaneous fluid. There were no local redness, apparent pain or neurological signs. Ultrasound imaging revealed a subcutaneous fluid collection consistent with CSF leakage. A conservative approach using a compressive dressing and close monitoring was initiated. Cranial ultrasound confirmed preserved cerebrospinal fluid volume within the ventricles, and the infant remained asymptomatic throughout. The swelling resolved spontaneously within twenty-four hours, with no recurrence at follow-up.
Final diagnosis revealed Group B Streptococcus bacteremia requiring a ten days course of intravenous antibiotic, with a favorable clinical course and full recovery.

Subcutaneous CSF leaks following lumbar puncture are uncommon. Ultrasound is a useful non-invasive tool for diagnosis.
Most cases resolve with conservative management which avoid the need for invasive procedures such as epidural blood patch or surgical repair.

Preventive recommendations are essential and include using the smallest appropriate needle gauge, ensuring both optimal infant positioning and appropriate needle orientation, and systematically reintroducing the stylet before needle withdrawal. Current evidence suggests neither the number of puncture attempts nor the occurrence of traumatic taps significantly increases the risk of CFS leakage. This case emphasizes the importance of recognizing this rare complication after lumbar puncture in infants. Early recognition and appropriate conservative management usually ensure complete recovery.

Greater awareness of this complication among clinicians can prevent unnecessary investigations and interventions.

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Clinical case | 3: Infectiology – pneumology - immunology

A tale of two cysts: contrasting clinical evolution of pulmonary lesions in children

Cystic echinococcosis (CE) is an important zoonosis affecting children in Echinococcus granulosus–endemic regions. We report two pulmonary CE cases in recently immigrated children, illustrating clinical heterogeneity, key diagnostic features and therapeutic considerations.
A 4-year-old Syrian boy, living in Belgium for 5 months, was asymptomatic (incidental finding) but had a 4.5-cm left-lower-lobe mass initially considered as benign tumor. CT-guided biopsy was non-diagnostic. Lobectomy revealed a collapsed cyst with lamellar acellular membranes containing hooklets. Surrounding lung tissue showed subacute inflammation with a histiocytic reaction. Serology confirmed E. granulosus infection. Screening for extrapulmonary CE (abdominal and cardiac ultrasound, brain MRI, fundoscopy) was negative. Albendazole 7.5 mg/kg q12h was stopped after 4 weeks since the cyst was completely removed and no extrapulmonary lesions were found.
In contrast, an 11-year-old Moroccan boy, living in Belgium for 1.5 years, presented with acute respiratory failure. Chest X-ray showed a 15-cm left pulmonary cyst and multilocular right-lung opacities. CT revealed a bronchus-communicating cyst with an air-fluid cavity separated by a floating membrane (water-lily sign). Due to intrabronchial cyst rupture, he developed severe ARDS requiring a 38-day PICU-stay, including 25 days of VV-ECMO. He underwent cyst marsupialization followed by several revisions for air leaks and hemothoraces, and was treated for pneumosepsis. Histopathology of the cyst wall showed protoscolices within lamellar membranes with minimal inflammation. Serology was positive for E. granulosus. Albendazole 7.5 mg/kg q12h was started nasogastrically on admission but yielded subtherapeutic levels, due to gastroparesis. After discharge, the same albendazole dose taken orally with a fatty meal achieved adequate drug levels. There were no extrapulmonary cysts and the remnant air-fluid collection slowly regressed. Due to cyst rupture, treatment duration was set at 2 years.
These cases illustrate the broad clinical spectrum of pulmonary CE—from a solid-tumor mimicking asymptomatic mass to a ruptured cyst causing ARDS. Awareness is key, as migration increases CE risk in non-endemic settings. Diagnosis relies on radiology, histopathology and serology. Intact cystectomy is curative, whereas ruptured cysts require prolonged albendazole, ideally taken with fatty meals to ensure adequate exposure. Drug monitoring can guide dosing.

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Clinical case | 3: Infectiology – pneumology - immunology

Chest Radiography in Chronic Cough and Wheezing in Children Under 5: Beyond Asthma. A case of thoracic lipoblastoma.

We review the indication of chest radiography in children under 5 years old presenting with asthma-like symptoms through the case of a 2-year-old girl diagnosed with a thoracic lipoblastoma.

Abstract :

Introduction: Chronic cough and wheezing are common symptoms in young children, often presumed to indicate asthma due to the prevalence up to 10% in this group age. The diagnosis remains clinical. However, diverse pathologies can present similarly, and chest radiography may be indicated. We review the indication of chest radiography through the case of a 2-year-old girl with worsening chronic nocturnal cough initially responsive to inhaled corticosteroids, chest X-ray led to the diagnosis of thoracic lipoblastoma.

Methods: We reviewed recommendations from the Global Initiative for Asthma 2025 guidelines and other pediatric respiratory organizations on using chest radiography to diagnose chronic cough and wheezing in young children.

Results: Asthma diagnosis in this age group relies on clinical evaluation and specific criteria from the GINA 2025 guidelines: recurrent acute wheezing episodes without likely alternative diagnoses and response to acute or long-term asthma treatment. Systematic chest radiography is not recommended but remain useful for identifying underlying respiratory disorders and excluding non-asthmatic cause, particularly if symptoms are uncommon, severe, or atypical.

Discussion: Despite these guidelines, distinguishing asthma from similar conditions remains challenging, especially given its prevalence of up to 10% in children under 5 years. Diagnosis remains clinical. Routine chest X-rays are not routinely recommended for diagnosing asthma or acute exacerbations in children under 5 years. Children receive higher radiation doses than adults from equivalent imaging, heightening risks. It should be for persistent or atypical symptoms or suspected alternatives, to identify structural abnormalities, chronic infections, or foreign bodies. Chest radiography is a cost-effective, accessible, and straightforward modality for investigating alternative etiologies, the GINA published a list of redflags to guide the clinician. In conclusion, routine chest radiography should be eschewed in uncomplicated asthma cases responsive to therapy yet employed judiciously to identify serious alternatives in atypical presentations.

Versmissen Guillaume and Berardis Silvia.

Clinical case | 3: Infectiology – pneumology - immunology

Necrotizing Pneumonia: an unexpected complication of RSV infection

Introduction

A case-presentation of a 16 month old girl with necrotizing pneumonia as a complication of RSV infection

Clinical History

A 16 month old girl, in generally good clinical condition, presented at the General Pediatrics Outpatient Clinic with fever , coughing and wheezing. Treatment for bronchiolitis with salbutamol puffs and respiratory physiotherapy was initiated. TWo days later she was seen again with persisting cough and fever , anorexia, but still in acceptable general condition. Chest X-ray was made showing bronchopneumonial infiltrate of the middle lobe and amoxicilline/ clavulanic acid added to tretament. Fourty-eight hours later the patient presented at the Emergency Department with high fever, and malaise.

Medical Work Out

Repeat Chest X-ray shows aggravation of the middle lobe pneumonia extending to the lower right lobe , and pleural effusion. Thoracic echography shows necrotizing pneumonia of the right lower lobe with suspicion of empyema. This was confirmed by CAT -scan,which also showed pneumatocele.
Blood sample showed very high CRP (460) and Leukocytosis with left shift.
Nasopharyngeal secretions are positive for RSV.

Treatment

Patient was admitted and antibiotherapy initiated with Clindamycin and Ceftriaxone for 14 days. Patient also required Oxygen -therapy. Salbutamol and physiotherapy where continued.
Patient could be discharged after two weeks of treatment.

Discussion

Necrotizing pneumonia is a rare complication of RSV infection. RSV stresses the lungs and can make it vulnerable for bacterial superinfection with MRSA or pneumococcus, causing tissue necrosis and empyema. Preterm infants, neonates and immunocompromised children are at risk. Sometimes , if antibiotherapy fails, surgical interventions might be necessary. A responsible bacteria could not be identified in this case. Long term prognosis has still to determined during close follow-up.

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Clinical case | 3: Infectiology – pneumology - immunology

Persistent Hypoxemia in an Infant with Bronchiolitis: A Case Report of a 14?Month?Old Girl.

Background
Hemoglobin is a tetrameric protein composed of two ?-chains and two non-?-chains. Variations within these chains can result in unstable hemoglobin molecules with altered oxygen-binding properties. Pulse oximetry estimates oxygen saturation by emitting two wavelengths of light through the skin and comparing the differential absorbance of oxygenated versus deoxygenated hemoglobin. Unstable hemoglobin variants may lead to falsely low pulse-oximetry readings for two main reasons. First, an unstable hemoglobin variant may exhibit an altered oxygen dissociation curve compared to the normal hemoglobin molecule. In low-affinity variants (like in our case), the hemoglobin saturation is reduced (as detected by pulse oximetry), although tissue oxygenation remains adequate, as confirmed by normal arterial blood gas analysis. Second, unstable variants can display abnormal light absorption characteristics, further impairing the accuracy of pulse-oximetry measurements.
CASE PRESENTATION
A 14-month-old girl presented with clinical signs consistent with bronchiolitis, including respiratory distress and hypoxemia. Despite recieving appropriate treatment, the child's oxygen saturation remained persistently and unexpectedly low, posing a diagnostic challenge. After a diagnostic work-up an underlying unstable hemoglobinopathy (hemoglobin Sabine) was found. In such cases, pulse oximetry provides unreliable oxygen saturation values, whereas arterial blood gas analysis offers a more accurate assessment of true oxygenation.
CONCLUSION
This case highlights the importance of maintaining a broad differential diagnosis when clinical findings and monitoring data appear inconsistent or unexplained. It also underscores the need to recognize the technical limitations of diagnostic tools.

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Clinical case | 4: Gastroenterology – nutrition

A kiss from blunt trauma: paediatric Gastric Ulcers after Blunt Abdominal Injury.

Introduction:
Hollow viscus injuries, though rare in blunt abdominal trauma, carry significant morbidity and mortality (10–20%). Diagnosis is challenging, and delays can worsen outcomes. We report a 9-year-old girl presenting with hematemesis due to a trauma-induced gastric ulcer, one week after striking her epigastrium against a steering wheel in a golf cart collision.

Case Report:
The child presented to the emergency department with acute hematemesis (three times within two hours) and shock. Following the accident, she experienced only mild transient abdominal discomfort and required no analgesics. On arrival, she was pale, hypotensive (82/40 mmHg; ?1.7/?1.8 SD) and tachycardic (120 bpm). Laboratory results showed haemoglobin of 7.5 g/dL (normal> 11.5 g/dL). Abdominal ultrasound was normal. Upper gastrointestinal endoscopy revealed two opposing antral ulcers, so-called “kissing ulcers”, one actively bleeding. Treatment with high-dose proton pump inhibitors, blood transfusion, and endoscopic hemoclip placement achieved definitive haemostasis without recurrence. Helicobacter pylori infection and hypergastrinemia were excluded. Follow-up endoscopy eight weeks later showed complete ulcer healing.

Discussion:
Acute upper gastrointestinal bleeding remains a medical emergency, with peptic ulcer disease as a major cause. Children are more vulnerable to blunt abdominal trauma due to a thinner abdominal wall, a horizontally oriented diaphragm, and elastic ribs. However, gastric ulcers secondary to trauma are exceedingly rare—only four paediatric cases have been previously reported. Typically, they appear as “kissing ulcers” on opposite gastric walls, likely caused by compression of the stomach between the anterior abdominal wall and the spine during impact, which can lead to mucosal damage and, in severe cases, perforation. Ongoing erosion into deeper layers may cause delayed haemorrhage or perforation, as seen in this case. Diagnosis is often challenging due to nonspecific symptoms, often delayed presentation, and rarity. Early recognition, prompt endoscopy, and appropriate medical and endoscopic management are essential to prevent serious complications.

Conclusion:
Trauma-induced gastric ulcers in children are rare but potentially life-threatening. This case highlights the importance of maintaining a high index of suspicion for gastrointestinal injury in paediatric blunt trauma and underscores the critical role of timely diagnosis and intervention.

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Clinical case | 4: Gastroenterology – nutrition

Three Faces of Obstruction: Unusual Presentations in Children

INTRODUCTION Gastrointestinal (GI) obstruction is a well-known but diagnostically challenging condition in children. Its heterogeneous presentation—ranging from subtle feeding difficulties to acute abdominal distress—may delay diagnosis, increasing the risk of morbidity and even mortality. We present three paediatric cases of GI obstruction, each illustrating a distinct presentation and clinical approach.
CLINICAL CASES
Case 1: An 8-month-old boy was initially admitted to another hospital for presumed acute gastritis with vomiting and dehydration, requiring IV fluids. After three days, he developed bilious vomiting, abdominal pain, and absent bowel sounds. Blood tests were normal. Radiography suggested small bowel obstruction, and ultrasound revealed an abdominal mass, prompting transfer. CT scan identified a duplication cyst with suspected intermittent strangulation. The patient underwent urgent laparotomy with resection of the cyst. Recovery was uneventful.
Case 2: A 4-year-old boy presented with acute abdominal pain and vomiting. Laboratory tests showed mildly elevated inflammatory markers, with normal lactate. Initial imaging (X-ray and ultrasound) demonstrated faecal stasis, without clear evidence of GI obstruction. He was admitted for observation with IV fluids and nasogastric tube drainage. Recurrent episodes of pain and vomiting in the following hours prompted CT imaging, which revealed a closed-loop obstruction with bowel ischaemia. Urgent laparotomy identified internal herniation caused by a Meckel's diverticulum with an omphalomesenteric fistula. Surgical resection was performed, and the child recovered uneventfully.
Case 3: A 23-month-old boy presented with acute vomiting and marked abdominal distension. Laboratory tests showed normal inflammatory markers, elevated lactate, and fulminant liver failure. Radiography indicated GI obstruction with a massively dilated stomach. His condition rapidly deteriorated into septic shock, necessitating intubation. Urgent laparotomy revealed a gastric volvulus with perforation. A partial gastrectomy and gastroplasty were performed. Despite intervention, the child died eight days later.
TAKE-HOME Gastro-intestinal obstruction may present with nonspecific symptoms. A child with (bilious) vomiting, and painful or distended abdomen warrants further investigations. Lactate and C-reactive protein levels may be misleadingly low. Early exploratory laparotomy is crucial to avoid complications.

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Clinical case | 4: Gastroenterology – nutrition

Cytomegalovirus-associated Menetrier’s Disease in a 3-Year-Old Child: A Rare Cause of Acute Protein-Losing Gastropathy

Introduction : Menetrier’s disease is a rare hypertrophic gastropathy causing protein-losing enteropathy, and is associated with cytomegalovirus (CMV) infection in approximately 70% of pediatric cases. This condition should be considered in any child presenting with acute-onset hypoalbuminemia and edema suggestive of exudative enteropathy. Although usually transient and with a favorable outcome in children, early recognition allows targeted management, including antiviral therapy in severe cases, which may accelerate recovery.
Case Presentation : A 3-year-5-month-old boy presents with progressive facial, limb, and scrotal edema in a context of abdominal pain evolving for two weeks. Laboratory tests show global hypoproteinemia (2.8 g/dL), severe hypoalbuminemia (1.8 g/dL) and global hypogammaglobulinemia, without inflammatory syndrome or hepatic dysfunction. Urinary protein loss is excluded and cardiac evaluation is normal.
The laboratory workup also shows iron deficiency (low ferritin) and vitamin B12 deficiency, without other significant micronutrient abnormalities. Ileo-colonoscopy shows no abnormalities. In contrast, upper gastrointestinal endoscopy reveals a thickened, hemorrhagic, polypoid gastric mucosa with a characteristic “cushion-like’’ appearance. Histology shows foveolar hyperplasia, marked mucosal edema, and a dense eosinophilic infiltrate. Helicobacter pylori infection is ruled out.
Active CMV infection is confirmed by positive serology and CMV PCR in both blood and gastric biopsies.
Management and Outcomes : Management includes albumin infusions, diuretics, short-course corticosteroids, and nutritional support. Given the severity of protein loss and the confirmed CMV infection, intravenous ganciclovir is administered for two weeks, after which oral valganciclovir is introduced, for a total antiviral treatment duration of two months.
The clinical course is favorable, with resolution of edema and normalization of serum proteins within three weeks. At one month, follow-up gastroscopy shows near-complete mucosal normalization and CMV PCR becomes negative.
Conclusion : This case highlights the importance of considering CMV-associated Menetrier’s disease in any child presenting with rapidly developing hypoalbuminemia and edema from digestive origin. While most pediatric cases resolve spontaneously, severe forms with confirmed active CMV infection may benefit from antiviral therapy, which can accelerate recovery and prevent complications.

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Clinical case | 4: Gastroenterology – nutrition

Gastric Trichobezoars in Children and Adolescents: A Single-Center Case Series

Background: Trichobezoars are rare intragastric masses composed of hair, typically affecting children and adolescents with trichotillomania and trichophagia. Their nonspecific presentation often delays diagnosis and may result in complications such as malnutrition or gastric perforation. This study describes our experience in managing pediatric trichobezoars in a tertiary European center.

Methods: We retrospectively reviewed all pediatric (<18 years) cases of gastric bezoar managed at a pediatric hospital in Brussels, Belgium, between 2010 and 2025. Data extracted from electronic medical records included demographics, clinical presentation, comorbidities, imaging findings, therapeutic approach, complications, and outcomes.

Results: Five pediatric patients (four females, one male; age 6–15 years) were diagnosed with gastric trichobezoars. Recurrent vomiting, abdominal pain, early satiety, and constipation were the most common symptoms, and three patients were malnourished. Psychiatric or behavioral comorbidities were present in four cases, including trichotillomania, trichophagia, anxiety, or autism with pica. Ultrasound and plain radiography were unhelpful in all cases. CT raised suspicion of a bezoar in each patient, leading to endoscopic confirmation in three; however, the size of the trichobezoars prevented endoscopic removal. All patients underwent gastrotomy for bezoar extraction, performed via laparotomy in four cases and a laparoscopy-assisted approach in one. Two postoperative complications occurred (pneumoperitoneum and wound infection). All patients received psychiatric follow-up, and clinical outcomes were favorable.

Conclusions: Pediatric trichobezoars, though rare, are important causes of recurrent vomiting. Nonspecific symptoms and psychiatric comorbidities often delay diagnosis. Persistent vomiting with early satiety or weight loss should prompt imaging to exclude bezoar. Multidisciplinary management involving pediatrics, gastroenterology, and psychiatry is essential to prevent recurrence.

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Clinical case | 5: Oncology – hematology

Acute vision loss in sickle cell disease, a clinical case

Central and branch retinal artery occlusion (CRAO/BRAO) is a rare but severe complication in sickle cell disease (SCD), which could lead to permanent blindness. We describe here an unusual clinical case of BRAO associated with optic neuropathy.

Case
A 16-year-old Congolese SCD (HbSS) patient experienced progressive, and painful loss of vision (LOV) over 48 hours, followed by complete loss 3 days after onset.
Clinical examination, particularly neurological, was normal except for right eye LOV. Biological findings showed a stable hemoglobin level at 9.9g/dl with normal white blood cells and platelet count, and 83% HbS level. Ophthalmology investigations, including optical coherence tomography and fluoresceine angiography revealed a right retinal ischemia and papilledema. Brain MRI showed signs of optic neuropathy. Lumbar puncture performed to rule out inflammatory optic neuropathy was normal.
Emergency exchange transfusion (ET) was applied along with intravitreal anti-vascular endothelial growth factor and systemic corticosteroid therapy, follow by regular ET program. His vision slowly improved with a visual acuity going from 0 to 5/10 after 2 months of follow-up.

Discussion
Retinal vascular occlusions (RVO), often secondary to systemic disease, have poor prognosis. Although sickle cell retinopathy and peripheral vascular occlusions are well-described entities, the risk of larger vessel occlusion affecting the eyes in SCD is less well known. In a 2024 large retrospective cohort study of SCD in a national United States database, Koufmann et al showed that patients with SCD had a 2.7 and 4.9 times higher risk of developing CRAO and BRAO respectively. There was no increased risk of venous occlusion.
CRAO often presents with sudden, painless LOV. In this case, the LOV had a longer and painful delay. Further investigations have been carried out to exclude another underlying pathology, especially inflammatory optic neuropathy. Hence the corticosteroid therapy the patient received.
Awareness for recognition of rare complications in SCD is essential for their optimal management, particularly for CRAO event. Guidelines are not yet published for the care of CRAO due to the lack of data. ET is mandatory and systemic thrombolysis has been reported also effective in some cases reports.

Conclusion
Early recognition of rare complications in SCD could lead to improved outcome and reduced morbidity and mortality associated with such conditions.

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Clinical case | 6: Neurology – genetics - neuroorthopedics

The undiscovered clinical landscape of pediatric Neuroborreliosis – a case report

Background Neuroborreliosis, a rare neurological manifestation of Lyme disease, typically presents in the acute disseminated stage with meningitis, facial nerve palsy or radiculo-neuritis. This clinical case proves there is a broader spectrum.
Case Presentation A 11-year-old male, previously treated for Henoch-Schonlein vasculitis with Medrol/ Methotrexate, was admitted with complaints of progressive headache, dizziness, chills, abdominal pain, and two weeks of hyperesthesia and allodynia in the left arm (C7-C8 dermatome). There had been a tick bite in July of this year, without an erythema chronicum migrans.
Findings on clinical examination Neurological examination revealed ataxia, difficulty standing unipodally, and decreased strength in the left upper limb (biceps and hand strength), while reflexes and sensation remained intact. Gait was abnormal with a dangling left arm and asymmetry in the gait pattern, also a positive test of Romberg.
Diagnostics Biochemical tests showed no infectious blood markers, and urine toxicology was negative. Cerebrospinal fluid analysis revealed pleocytosis, a meningitis-encephalitis panel was negative. Despite a negative Borrelia serology in blood, intrathecal antibodies specific for neuroborreliosis were detected in the CSF with elevated CXCL13, confirming an active neuroborreliosis infection. Interestingly, brain MRI revealed subacute ischemia bilaterally in the pyramidal tract and right medial lemniscus of the medulla oblongata. This suggests central nervous system involvement, not only the typical radiculo-neuritis or meningitis presentation of neuroborreliosis.
Discussion Although rare, neuroborreliosis has been associated with cerebrovascular events in some literature reports, where patients have stroke-like episodes which would explain the MRI findings.
Other possibilities seemed unlikely, such as hypercoagulability with ischemic stroke (negative work-up and negative personal and family history) or small vessel vasculitis. This was investigated further especially because of the patients history of HSP (could the neuroborreliosis now have triggered a vasculitis-like event?). Rheumatologic screening was normal and MRI imaging showed no signs of vasculitis, therefore this hypothesis was abandoned.
Management and Outcome Patient was started on IV ceftriaxone and high-dose IV methylprednisolone. After 3 days of pulse steroids, the patient's clinical condition improved significantly. Follow-up brain MRI is planned.

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Clinical case | 6: Neurology – genetics - neuroorthopedics

Ischemic stroke in children post-varicella zoster infection.

BACKGROUND: An ischemic stroke is rare in children. It can be caused by certain infectious triggers, with varicella zoster being a known but uncommon cause. Post-varicella cerebral vasculopathy constitutes an important mechanism leading to an arterial ischemic stroke, frequently with delayed neurological presentation after the initial infection.
CASE: A 2-year-old boy is presented to the emergency department of a hospital in Belgium with a one-day history of progressive increase in drooping of the left corner of the mouth. Besides a decreased gait stability, no other symptoms were noted. Four weeks prior to presentation, he had a varicella infection with no active lesions at the time of admission. On examination, a central nerve palsy and mild ataxia were observed. Laboratory testing showed no signs of inflammation. Neuroimaging was performed: cranial CT revealed a hypodense area involving the right nucleus caudatus and nucleus lentiformis, which was confirmed on MRI and characterized as an ischemic infarct.
An elaborate diagnostic workup was undertaken to investigate the cause of the stroke. Serological testing for Borrelia burgdorferi and Varicella zoster were negative. Further cardiological and metabolic evaluation was unremarkable, and coagulation studies were within normal limits. Genetic testing via whole-exome sequencing was undertaken to screen for rare pathogenic disorders affecting the vascular integrity.
At the moment of admission, intravenous acyclovir was initiated due to high suspicion of varicella-induced vasculopathy causing the stroke. This therapy was discontinued after 3 days once cerebrospinal fluid (CSF) testing for varicella-zoster IgG returned negative. The boy also received acetylsalicylic acid which was continued after being discharged. Clinical improvement was noted within several days, although full recovery had not yet been achieved.
CONCLUSION: This case highlights the importance of maintaining a broad differential diagnosis to guide a structured diagnostic approach. Varicella-zoster virus is a significant cause of pediatric stroke and should be considered in the workup. Whereas it typically presents with arm paresis, this case demonstrated an atypical presentation with central nerve palsy. A negative CSF varicella-zoster IgG does not definitively exclude the diagnosis, as antibodies in the CSF may not yet be detectable in the early course of the disease.

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Clinical case | 6: Neurology – genetics - neuroorthopedics

Not all unexplainable pain is psychological – Neuropathic pain due to a tentative diagnosis of syringohydromyelia in 14-year-old girl

Background: Neuropathic pain, often described as a sharp, burning or electric sensation, results from dysfunction or injury of the peripheral or central nervous system. In children, it is often difficult to recognize, yet symptoms can be severe, persistent and disabling. Syringohydromyelia is a cystic dilatation of the spinal cord central canal, often associated with Chiari I malformation, tethered cord, myelomeningocele, though many cases are idiopathic. Although most cases are asymptomatic, symptomatic cases may present with back pain, gait disturbances, scoliosis, or sensory deficit. Case presentation: A 14-year-old girl presented with recurring left-sided thoracic and flank pain for four weeks. One year earlier, she had experienced similar complaints, which was attributed to pleuritis and resolved after non-evidence-based alternative therapy. The current episode involved progressive tightening thoracic pain with marked allodynia, making her intolerant for clothing and eliciting shooting pain with minimal touch. The pain was refractory to analgetics and had a major impact on school attendance. Physical examination showed pronounced left-sided thoracic and flank allodynia without neurological deficits or skin abnormalities. Routine laboratory tests, chest radiography, abdominal ultrasound and other investigations (bone scintigraphy, SPECT-CT, echocardiography) were unremarkable. Upon admission, a dual approach of psychoeducation and relaxation therapy was initiated. Child psychiatry recommended cognitive-behavioral therapy and analgetics were discontinued due to lack of efficacy. To rule out underlying structural abnormalities, a full spine MRI was scheduled upon discharge. MRI subsequently revealed syringohydromyelia extending from T4 to the conus medullaris, without tethered cord, spinal canal stenosis, spinal tumor or radicular compression. A tentative diagnosis of neuropathic pain associated with syringohydromyelia was made and the patient was referred to the pediatric neurologist for further assessment and management. Treatment options are currently under consideration, as clear management guidelines are lacking. Conclusion: This case illustrates that chronic unexplained pain in children should not be prematurely attributed to psychological causes. Neuropathic pain should be considered when symptoms are disproportionate to tactile stimuli. While a multimodal management approach remains important, clinicians must avoid diagnostic bias.

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Clinical case | 6: Neurology – genetics - neuroorthopedics

Cerebellitis in a Child With Influenza A and Anti-Yo Antibodies: A Case Description and Literature Review

We report a hyperacute cerebellitis in a previously healthy 5-year-old girl with confirmed Influenza A and unexpected Anti-Yo seropositivity. She developed rapid-onset ataxia, diplopia and dysarthria, with MRI showing vascular oedema consistent with cerebellitis. CSF demonstrated pleocytosis and a single unmatched oligoclonal band; malignancy screening remained negative. Clinical improvement followed plasmapheresis. A structured literature search across five databases was conducted to contextualise this presentation within autoimmune and post-infectious cerebellar syndromes. Diagnostic challenges, antibody significance, radiological interpretation, and therapeutic implications—including the relevance of Anti-Yo in non-paraneoplastic settings—are further explored in the discussion.

1st: dr. Rik Muskens. 1st promotor: prof. dr. Katrien Jansens. Co-promotor: dr. Kristien Evens. Listed as co-writers for their efforts in feedback: prof. dr. Helene Verhelst, dr. Delphine Dinneweth

PLEASE NOTE I AM ABLE TO BE PRESENT ONLY 2ND DAY THANK YOU

Clinical case | 7: Cardiology

When imaging becomes lifesaving

Introduction:
Ductus arteriosus aneurysm (DAA) is a congenital dilatation of the ductus arteriosus, commonly diagnosed in the early neonatal period. Its pathophysiology is not fully understood but could involve media necrosis, abnormal elastin or collagen deposition, or increased shear stress. Echocardiographic studies have reported an incidence of up to 8.8% in term fetuses. Most DAAs resolve spontaneously, yet some may lead to thrombosis or thromboembolic events.
Discussion:
We report the case of a 36-week neonate with intrauterine growth restriction, presenting an undefined mediastinal mass diagnosed on routine echocardiography. Further investigations by cardiac MRI and contrast-enhanced CT scan revealed a thrombosed DAA protruding into the left pulmonary artery (LPA) (Figure 1). Despite initial treatment with unfractionated heparin (UFH), cardiac ultrasound showed a progression of the thrombus and increasing gradient on the pulmonary arteries (peak gradients of 82mmHg), warranting surgical thrombectomy. During surgery, dissected ductus arteriosus extending into the LPA was discovered and left pulmonary arterioplasty has been necessary. After surgery, the infant developed cardiorespiratory failure requiring vasopressors, inodilators, corticosteroids and mechanical ventilation, as well as a suspected septic episode treated empirically. Multiple arterial thromboses, including bilateral iliac occlusions, did not completely resolve under UFH and were later managed with low-molecular-weight heparin and direct oral anticoagulants, triggering suspicion of an underlying thrombophilic disorder, with ongoing investigations. Refractory status epilepticus—most likely due to low cerebral perfusion—was suppressed by antiepileptics, and a brain MRI with auditory brainstem responses confirmed normal neurological evolution. Transient cardiac arrhythmias, chylothorax, and stage Ia necrotizing enterocolitis were treated by medical management. Anticoagulation therapy is being continued, and the patient has achieved full recovery without sequelae.
Conclusion:
DAA is likely underdiagnosed and may progress silently in stable patients. Although often benign, its complications can be severe. Regular echocardiographic monitoring is key to early diagnosis and efficient management. Surgical intervention remains the gold standard for complicated forms and should be performed in specialized centers.

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Clinical case | 7: Cardiology

Fenestrated atrial septal defect closure in a toddler with pulmonary hypertension

Background
Pulmonary hypertension (PH) is defined by elevated pulmonary artery pressures, leading to increased right ventricular (RV) loading and potentially progressing to RV failure. In patients with PH associated with an atrial septal defect (ASD) and a significant left?to?right shunt (Qp:Qs > 1.5:1), current adult ESC guidelines recommend defect closure when pulmonary vascular resistance (PVR) is not elevated (< 3 WU). In contrast, patients with markedly increased PVR (> 5 WU) require careful evaluation or prior treatment, as complete closure carries the risk of syncope or cardiac arrest during a pulmonary hypertensive crisis.

Case
A 2-year-old boy experienced a brief cardiac arrest during a minor elective procedure and was found to have a secundum ASD (10-12mm), RV dilation, and significant tricuspid regurgitation (TR) with an elevated peak gradient (60 mmHg), raising concern for PH. Despite resolution of intercurrent infection and treatment with diuretics and a phosphodiesterase-5 inhibitor, the patient could not be weaned off mechanical ventilation with persistently elevated RV pressures. A diagnostic catheterization procedure was performed, confirming pulmonary arterial hypertension (PAH) with mean PA pressure 44 mmHg, left atrial pressure 12mmHg and PVR 9.45 WU (3.3 WUm2); Qp:Qs by Fick was 2.1:1. Inhaled nitric oxide demonstrated reversibility, reducing mean PA pressure to 31 mmHg and increasing shunt magnitude (Qp:Qs 3:1); PVR decreased to 3.56 WU (1,25WUm2).
Following invasive confirmation of PAH, an endothelin receptor antagonist was added allowing ventilatory weaning after 72h. To reduce excessive left-to-right shunting while maintaining a controlled right-to-left pop-off during potential pulmonary hypertensive crises, the ASD was closed percutaneously three months later using a 12-mm fenestrated Occlutech device (Schaffhausen, Switzerland), after permission was obtained from the FAGG. This combined strategy resulted in clinical improvement over the subsequent months. Parents reported increased energy levels, and echocardiography demonstrated resolution of TR and reduced interventricular septal flattening. A follow-up catheterization is planned 6 months after device placement. Results of a genetic panel for PH are pending.

Conclusion
This case illustrates that in young pediatric patients with a secundum ASD and severe PH, a combined interventional and pharmacologic approach is feasible, effective and even necessary.

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Clinical case | 7: Cardiology

Successful endovascular treatment of acute mechanical mitral valve thrombosis with local recombinant tissue plasminogen activator in a 2-year-old

Severe mitral dysfunction in children is associated with significant therapeutic challenges, particularly when mechanical valve insertion is needed after valvuloplasty fails. It necessitates meticulous management of anticoagulation, as replacement of mitral valves in pediatric populations has a known risk of thrombosis and hemorrhagic events.
A 2-year-old girl with congenital mitral stenosis and prior multiple valve repairs underwent mechanical mitral valve replacement. Postoperative anticoagulation was initiated with low molecular weight heparin transitioning to vitamin K-antagonists (VKA); however, stable INR levels were difficult to maintain. After twenty days of post-surgery, she developed mechanical valve thrombosis, with echocardiography showing an impaired leaflet mobility and a mean transvalvular gradient of 22 mmHg, with important post-capillary pulmonary hypertension. Due to complex surgical history and stable anticoagulation hard to maintain, our patient was treated with a local continuous infusion of recombinant tPA (Alteplase) directly into the left atrium with a catheter type Merit Pigtail 4F from which the curl had been cut off, via femoral venous access and through interatrial fenestration. Doses were initially 0.045 mg/kg/h, then escalated to 0.1 mg/kg/h over 48 hours, with continuous intravenous heparin administered to prevent new thrombus formation.
Within 48 hours of local treatment, there was an improvement in leaflet mobility and a significant reduction in the transvalvular gradient (mean 4mmHg). Complete thrombus resolution was achieved without hemorrhagic complication. She was again relayed to VKA, with stable INR rates. At 18 months of follow-up, the patient demonstrated good mechanical valve function and clinical recovery.
This case illustrates that continuous, low-dose local thrombolysis with recombinant tPA is a safe and effective alternative to surgery for mechanical mitral valve thrombosis in pediatric patients, especially those with elevated surgical risks. The approach allows targeted clot dissolution with lower bleeding risk compared to systemic thrombolysis. Individualized anticoagulation management and multidisciplinary care remain essential to improving outcomes in this vulnerable population.

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Clinical case | 7: Cardiology

An unusual and reversible cause of pediatric atrial tachycardia: celiac disease.

Atrial tachycardia is uncommon in children, accounting for 5-10% of pediatric supraventricular tachycardias. The most prevalent type is focal atrial tachycardia while multifocal atrial tachycardia is very rare in children. It can be incessant leading to tachycardia-induced cardiomyopathy and heart failure.

In a 4-year-old boy, irregular tachycardia was detected during preoperative evaluation for a gastroscopy which was planned because celiac disease was suspected. Besides complaints leading to suspect celiac disease the patient had no relevant past medical history. The tachycardia was well tolerated, with no cardiac-related symptoms, including no signs of heart failure.
ECG showed a baseline narrow-complex tachycardia with variable rate between 150 and 300 bpm, alternating with wide, polymorphic QRS complexes occurring as isolated beats, in runs, and in bigeminy, with different P wave morphologies, consistent with multifocal atrial tachycardia.
Structural heart disease was excluded as a cause by echocardiography, in addition there were no signs of peri- or myocarditis, or valvular disease. Other causes of tachycardia like fever, anemia, electrolyte abnormalities, hyperthyroidism and drugs -or substance abuse were ruled out. A genetic panel for primary electrical cardiac disorders demonstrated no pathogenic variants.

He was hospitalized for cardiac monitoring, and atenolol was initiated at 1 mg/kg/day, with a working diagnosis of atrial tachycardia with intermittent aberrant conduction of unclear etiology. He was discharged after rate control was established.
Persistent atrial tachycardia was seen on 24h-ECG recording under atenolol with frequent episodes of atrial tachycardia with 2:1 block, as well as episodes of focal atrial tachycardia with aberrancy. Flecainide was added at 3 mg/kg/day which achieved rhythm control after one month.
After initiation of a gluten-free diet, the gastrointestinal symptoms resolved, and anti-tTG IgA antibodies became negative. Antiarrhythmic therapy was discontinued, and no recurrence has occurred up to 2 years. Given the resolution of the atrial tachycardia in parallel with improvement of celiac disease, the atrial tachycardia was considered to be secondary to celiac disease.

We present a case of atrial tachycardia in a 4 year old boy linked with celiac disease. Although this association has been extensively described in adults, to our knowledge it has not previously been reported in pediatric patients.

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Clinical case | 8: Nephrology

From sepsis to severe systemic disease: The multisystem complexity of congenital nephrotic syndrome

Presentation: This boy presented acutely ill at the emergency department at the age of 5 weeks old with Streptococcus pneumoniae sepsis. He had edema, ascites and significant hypoalbuminemia (13,6 g/dL) at presentation. Urine testing showed massive proteinuria (73,6 g/g creatinine).
Diagnostic workup: Most cases of congenital nephrotic syndrome (CNS) are due to a genetic mutation. However, whole exome sequencing did not find any pathogenic mutations linked to CNS. Infectious causes of CNS were ruled out.
Disease course: Despite RAAS blockade, an indomethacin trial, and a steroid trial, the boy remained profoundly nephrotic and in need of daily albumin infusions. Because of persistent massive proteinuria and worsening complications, a unilateral nephrectomy was performed at 5 months of age. Postoperatively, proteinuria decreased but remained extremely high. Nonetheless, he showed clinical improvement and albumin infusions could gradually be reduced in dose and switched to alternate-day administration. Given the complexity of renal replacement therapy in young children, bilateral nephrectomy is being postponed for as long as no further serious complications of CNS occur. He is expected to require renal replacement therapy and eventually a renal transplantation in the future.
Complications: The disease course was complicated by important adverse events, reflecting the systemic burden of CNS. The patient experienced recurrent venous thromboses related to central venous catheters, despite management with high doses of SC enoxaparin and IV antithrombin-III (AT-III) supplementation. Infectious morbidity was high, with multiple episodes of sepsis, despite episodic IVIG supplementation and antibiotic prophylaxis. Chronic anemia required escalating erythropoiesis-stimulating therapy, IV iron, and intermittent blood transfusions. Hypothyroidism and vitamin D deficiency necessitated oral supplementation. Intensive multidisciplinary follow-up (physiotherapist, dietician, speech and language therapist) proved crucial to promote growth and neuromotor development. Lastly, this boy has been hospitalized since presentation, imposing a high psychosocial burden on the family.
Conclusion: This case illustrates the multisystem complexity of severe CNS, including thrombotic tendency, recurrent infections, marked nutritional and developmental vulnerability, and a high psychosocial burden. Early multidisciplinary coordination is essential in the management of CNS.

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Clinical case | 8: Nephrology

Pediatric hematuria secondary to Schistosoma haematobium infection: a case report

Introduction: Schistosoma haematobium infection is an important but often overlooked cause of hematuria in non-endemic regions. Delayed symptom onset following remote travel exposure can complicate timely diagnosis.
Methods: We describe the clinical features, laboratory findings, imaging results and parasitological confirmation in a 12-year-old boy with macroscopic hematuria. Follow-up was performed four weeks after treatment.
Results: The patient presented with two months of bright red terminal hematuria, abdominal pain and dysuria, without systemic symptoms. Urine analysis showed pyuria (655 WBC/µL), hematuria (259 RBC/µL) and mild proteinuria (0.6 g/g creatinine). Blood tests demonstrated a normal blood count with marked eosinophilia (26.4%) and normal renal function. Ultrasound revealed multiple nodular bladder wal thickenings; kidneys were morphological normal. Travel history uncovered freshwater exposure in Egypt 14 months earlier. Urine microscopy confirmed S. haematobium ova and also serology was positive. Treatment with praziquantel resulted in complete resolution of hematuria and a marked reduction in eosinophilia at four-week-follow-up.
Discussion: This case underscores the need to consider urogenital schistosmiasis in children with persistent or atypical hematuria, even when travel exposure occured more than one year prior. Thorough travel history remains essential for acurate diagnosis in non-endemic settings.

Eva Grootjans (ZAS Paola), Emmi Van Damme (ZAS Palfijn), Ine Decuyper (ZAS Paola, ITG Antwerpen), Nathalie Segers (ZAS Paola)

Clinical case | 9: Endocrinology

ATYPICAL TYPE 1 DIABETES PRESENTATION: SEVERE METABOLIC ACIDOSIS WITHOUT KETOSIS DUE TO HMGCS2 DEFICIENCY

Background and aims - Diabetic ketoacidosis is a common condition at the onset of type 1 diabetes (T1D) in children, but it is not an indispensable diagnostic hallmark.
Methods - We report an unusual case of severe acidosis without ketosis caused by HMG-CS2 (3-hydroxy-3-methylglutaryl-CoA synthase) deficiency, a rare autosomal recessive inborn error of metabolism that impairs ketone production.
Case report - A 2-year-old girl was admitted with asthenia, anorexia, vomiting, and tachypnea. Clinical history revealed two months of polyuria, polydipsia, and 11% weight loss. Upon admission, she was hemodynamically and neurologically stable. Laboratory tests confirmed metabolic acidosis (pH 7.20, bicarbonate 4 mmol/L, base excess -21 mmol/L), moderate hyperglycemia (154 mg/dL), and low serum ketones (?-hydroxybutyrate 0.4 mmol/L). Elevated liver enzymes indicated hepatic cytolysis (AST 492 U/L, ALT 485 U/L). HbA1c was 12%, C-peptide was low (<0.050 nmol/L) and auto antibodies against beta cells (Glutamic Acid Decarboxylase Antibodies, Islet Antigen 2 Antibodies) were positive. Genetic testing identified a homozygous deletion of exon 1 in the HMGCS2 gene. Insulin therapy was initiated with a diet designed to prevent catabolism and ensure adequate carbohydrate intake while minimizing dependence on ketone production.
Conclusions - Metabolic disorders such as HMGCS2 deficiency may impair ketogenesis, leading to atypical presentations of T1D without ketosis. Early recognition of these rare inborn error of metabolism is essential to avoid misdiagnosis and guide appropriate management.

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Clinical case | 9: Endocrinology

46 XY gonadal dysgenesis due to amplification of DAX-1 / NR0B1 gene.

We report the case of a patient presenting with genotype-phenotype discordance caused by intragenic amplification of the DAX-1/NR0B1 gene. Despite a 46XY karyotype detected by non-invasive prenatal testing (NIPT), the newborn showed normal female external genitalia.
Pregnancy resulted from in vitro fertilization. Genotypic sex, as determined by cell free DNA testing was 46 XY while phenotypic sex was female at the second trimester ultrasound. The amniocentesis recommended to confirm sex reversal and exclude syndromic causes was refused by the parents. The baby was born at term by iterative cesarean section. Birth weight was 3320 g and birth length was 51.5 cm. Apgar score was 9/10/10. Clinical examination showed normal female genitalia. There were no palpable gonad. Urethral meatus and vaginal orifice had normal position. Hormonal evaluation performed on the first day of life showed: cortisol at 13.3 ?g/dL, 17- OH progesterone at 0.62 nmol/L, DHEA sulfate > 15,000 ng/ml, undetectable AMH and inhibin B values. Abdominal ultrasound showed a normal uterus with no testis or ovary visualised. Renal ultrasound was normal.
Postnatal karyotype and FISH confirmed the 46XY karyotype, with normal diploid chromosome content and normal SRY gene and Y chromosome. Analysis by comparative genomic hybridization (array-CGH) and the DSD-POI-HH-PAI genetic panel (Ghent university Hospital), identified a triplication of chrX:30218581-30309363 (GRCh38/hg38) corresponding to exons 1 and 2 of the NR0B1 gene (NM_000475.5).
DAX-1 (Dosage-sensitive Adrenal Hypoplasia critical region on the X chromosome, gene 1) or NR0B1 is located on the short arm of the X chromosome (Xp21.2-p21.3 in a dosage- sensitive region). It encodes a nuclear receptor that functions as a transcriptional repressor in gonadal and adrenal tissues. DAX1 regulates the activity of steroidogenic factor 1 (SF-1), ensuring proper expression of genes essential for steroidogenesis and testicular development. Its overexpression disrupts normal testicular differentiation, leading to testicular dysgenesis and absence of virilization in a 46XY fetus.
Long term follow-up regarding sex assignment, gonadal function and gonadal tumor risk is crucial in those patients and requires a multidisciplinary approach.

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Clinical case | 9: Endocrinology

Unexpected Hyperinsulinism in a Healthy Toddler: When Diet Tells the Story

Introduction
Initial presentation: An 18-month-old girl with an unremarkable medical history presented to her general practitioner with fatigue, somnolence, and inability to stand. She had experienced two brief episodes of generalized shaking involving both arms and legs. She was immediately referred to the emergency department, where her blood glucose was 36 mg/dL. Intravenous glucose was administered with good clinical response. However, during hospitalization, recurrent hypoglycemic episodes were observed. Laboratory analysis revealed inappropriately elevated insulin levels during hypoglycemia, with no other abnormalities.
Referral to Ghent University Hospital: After confirmation of hyperinsulinism, the patient was referred to Ghent University Hospital (UZ Ghent). Treatment with diazoxide (15 mg/kg/day) led to normalization of glycemia, and she was discharged in good condition.
Side effects: One week later, she re-presented with disseminated petechiae. Laboratory testing showed severe thrombocytopenia (unmeasurable platelets) and mild anemia with elevated reticulocytes. A platelet transfusion was administered, diazoxide was discontinued - as thrombopenia is a known side effect - and cornstarch therapy was initiated to maintain euglycemia. Glycemia remained fairly stable, and the patient was discharged. The parents reported recent initiation of iron supplementation and the introduction of meat into her diet, as the family followed a vegetarian and organic food lifestyle and the mother had been diagnosed with anemia.
Recurrent hypoglycemia: Following an episode of gastroenteritis with reduced oral intake, she was readmitted with blood glucose values between 40–50 mg/dL. Sandostatin was initiated at 10 µg/kg/day in three doses and titrated based on glucose levels, initially with good response. After one week, however, hypoglycemia recurred despite maximal dosing. At this stage, a pattern emerged: hypoglycemia occurred after meals containing meat. A leucine provocation test (using cooked chicken breast) induced both hypoglycemia and elevated plasma ammonia, confirming the suspicion of hyperinsulinism/hyperammonemia (HI/HA) syndrome. Genetic analysis identified a pathogenic GLUD1 variant (c.965G>A, class 5). Sandostatin therapy was optimized, and dietary leucine restriction was implemented, resulting in complete resolution of hypoglycemic episodes.

Aline Verstraeten, Ruben Van Paemel, Hanne Rigolle , Sara Van Aken, Saskia van der Straaten, Kathleen De Waele, Martine Cools and Lloyd J.W. Tack

Clinical case | 9: Endocrinology

When distinctive features tell a rare story: a boy with suspected congenital generalised lipodystrophy

INTRODUCTION
In children, many common diseases exhibit nonspecific symptoms, often complicating the diagnosis. Conversely, rare disorders may present with distinct features yet remain easily overlooked due to their low prevalence and clinicians' limited exposure. We report the case of a young boy with typical phenotypic characteristics of a rare congenital disorder.
CLINICAL CASE
A 2-month-old boy was referred to the paediatrician due to a discrepancy between his low weight and large length. Breastfeeding was adequate and medical history was unremarkable. Clinical examination showed a large, thin infant lacking visible subcutaneous adipose tissue, accompanied by umbilical protrusion and hepatomegaly, confirmed on abdominal ultrasound. Laboratory tests revealed elevated triglycerides, normoglycemia and very low leptin levels. Genetic testing identified two likely pathogenic AGPAT2 variants, supporting the diagnosis of congenital generalized lipodystrophy (CGL).
Lipodystrophy syndromes comprise a heterogeneous group of rare disorders that may be genetic or acquired. CGL is an autosomal recessive disorder affecting fewer than one in a million individuals. It is characterised by (near-)complete absence of subcutaneous fat resulting in very low leptin concentrations. Patients often experience hyperphagia and consume high amount of calories resulting in ectopic storage of lipids in muscle and liver. Associated complications include insulin resistance progressing to type 2 diabetes mellitus, hypertriglyceridemia with risk of pancreatitis, steatotic liver disease, hypertension, pubertal abnormalities, and reduced life expectancy. Recommended surveillance includes fasting glucose, HbA1c, liver function tests, lipid panel, urinary albumin-to-creatinine ratio, liver and cardiac ultrasound. Management of metabolic disturbances follows standard clinical guidelines. Selected patients may be eligible for treatment with recombinant human leptin (e.g. metreleptin).
TAKE HOME
Rare conditions may present with striking phenotypic features, but recognition requires clinical awareness and pattern recognition. CGL should be considered in infants with absent subcutaneous fat, accelerated linear growth, and disproportionate weight. Low leptin levels and hypertriglyceridemia can support the diagnosis, although genetic testing remains essential. Early identification enables timely metabolic monitoring and may prevent severe long-term complications.

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Clinical case | 9: Endocrinology

A Structured Diagnostic Approach to Pediatric Cushing Syndrome: A Case-Based Illustration

A 12.8-year-old girl was referred for progressive weight gain and classic signs of Cushing syndrome: centripetal obesity, moon face, buffalo hump, striae, hirsutism, acne and secondary amenorrhea. She also experienced glucose intolerance, fatigue and cognitive changes. There was no exposure to exogenous corticosteroids. On physical examination, her BMI was 27.6 kg/m² (SD +2.0). She was tachycardic but her blood pressure remained within normal limits. There was generalized adipose redistribution, and her pubertal development was appropriate for her age. Biochemical testing revealed a markedly elevated cortisol level of 29.2 µg/dL [2.7-10.4] and a measurable ACTH of 34.2 ng/L [10.0 - 60.0], suppressed gonadotropins and increased adrenal steroids. To further confirm hypercortisolism, three consecutive 24-hour urinary free cortisol measurements were markedly elevated, and midnight salivary cortisol was increased (1.669 µg/L). Pituitary MRI revealed a 4-mm hypointense microadenoma without mass effect. Based on these findings, a diagnosis of ACTH-dependent Cushing syndrome due to a pituitary microadenoma was established. The patient was referred for neurosurgical exploration.

Discussion
This case illustrates the importance of a systematic and thorough approach to diagnosing pediatric Cushing syndrome, a rare but serious endocrine disorder. The clinical presentation was classic, with multiple features pointing toward hypercortisolism. Biochemical confirmation is essential in suspected Cushing syndrome and multiple independent tests must confirm sustained cortisol excess. The combination of elevated serum and urinary cortisol, increased midnight salivary cortisol and measurable ACTH levels provided strong evidence for ACTH-dependent disease. The identification of a small pituitary microadenoma on MRI was consistent with Cushing disease, the most common cause of ACTH-dependent Cushing syndrome in children. In cases where imaging is inconclusive, additional dynamic endocrine testing or inferior petrosal sinus sampling may be necessary to confirm the diagnosis and guide management. This case underscores the value of a stepwise diagnostic algorithm, combining clinical assessment, biochemical testing, and targeted imaging, to ensure timely and accurate diagnosis and optimal outcomes for pediatric patients with Cushing syndrome. Referral to a specialized center for neurosurgical intervention is the recommended next step when a pituitary microadenoma is identified.

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Clinical case | 9: Endocrinology

Non-Thyroidal Illness Syndrome (NTIS) in a 7-Month-Old Infant with Treatment-Resistant Nephrotic Syndrome: A Therapeutic Challenge.

We present a case of a seven-month-old boy with congenital nephrotic syndrome (NS) and nonthyroidal illness syndrome (NTIS). Lab analysis showed a low FT4 of 0.6 ng/dL (ref 0.9-2.2), normal FT3 (2.6 pg/mL, 2-6) and normal TSH (5.4 mU/L, 0.7-11). Substitution with levothyroxine (LT4) 7µg/kg/d orally was installed. Hypothyroidism is a frequent comorbidity in NS and is mainly caused by urinary loss of thyroid hormone-binding proteins. Low serum protein concentrations also compromise the reliability of FT3/FT4 assays, introducing a diagnostic challenge. Guidelines advise a regular follow-up of thyroid function and recommend LT4 substitution in case of hypothyroidism. The management of NTIS is however not included. It remains unclear whether NTIS represents a physiological protective mechanism, or a damaging maladaptive response. In infants, thyroid hormone is crucial for brain development, further complicating the management dilemma.
We conducted a literature search in PubMed and Embase to explore whether LT4 supplementation is warranted.
Only 2 pediatric studies could be identified. Data from a cohort of pediatric acute lymphoblastic leukemia patients showed a high prevalence (74%) of NTIS. In this cohort, most thyroid dysfunctions recovered without the need for replacement therapy. This suggests that the primary focus should be on resolving the underlying disease, allowing the thyroid function to normalize spontaneously.
Conversely, a retrospective study examining 164 children (3-14y) with idiopathic NS and thyroid dysfunction suggested that FT3 and FT4 changes correlate with the severity of proteinuria. In this study, patients treated with corticosteroids combined with low-dose LT4 supplementation showed a significantly shorter time to proteinuria remission and a significantly higher serum albumin level after 14 days of combined treatment compared to those treated with corticosteroids alone.
Pediatric studies investigating the need of thyroid supplementation in NTIS with NS are very scarce. Thyroid function should be monitored in pediatric NS to exclude hypothyroidism. If present, this should be treated. There is currently insufficient evidence to support standard LT4 supplementation in children with NS and NTIS, although limited data suggest a positive effect on the course of NS. Moreover, careful LT4 supplementation can be considered in infants who depend on thyroid hormone for brain development until more data on this dilemma become available.

Bram Meertens, Lloyd Tack, Sara Van Aken, Martine Cools, Saskia van der Straaten

Clinical case | 10: Other - Pediatric Diabetology

Diagnostic Revision in Light of Clinical Evolution

Background: Type 1 diabetes (T1D) is the most common form of diabetes in children and adolescents, caused by autoimmune destruction of ?-cells and absolute insulin deficiency. It typically presents with polyuria, polydipsia and weight loss due to hyperglycemia. B-cell autoantibodies are found in approximately 80% of cases. Insulin-resistance syndromes—often linked to obesity and advanced age—can mimic T1D, leading to misclassification and unnecessary lifelong insulin therapy. This case highlights the diagnostic challenges encountered in a pediatric patient with atypical response to T1D management.
Clinical Case: A 12-year-old obese girl, with no family history of diabetes, presented with polyuria, polydipsia, and weight loss. She showed no signs of hyperandrogenism and had completed puberty. At diagnosis, blood glucose was 365 mg/dL, HbA1c 10.3% (89,2 mmol/mol) and serum insulin levels were mildly elevated (282 pmol/L). B-cell autoantibodies (anti-insulin, GADA, anti-IA2, ICA) were negative except for ZnT8 antibodies. Treated with insulin (multiple daily injections, later a hybrid closed loop insulin pump), the patient maintained excellent glycemic control with low insulin needs (maximum 0,6 UI/kg/day and minimum 0.17 UI/kg/day), suggesting persistent endogenous insulin production 11 months after diagnosis.
Given this prolonged remission, whole-exome sequencing was performed and identified a heterozygous c.1810C>T (p. Arg604Trp) variant in the INSR (Insulin Receptor) gene of unknown significance. Mutations of INSR gene impair insulin receptor signaling, consistent with insulin-resistance. Following this finding, metformin therapy was initiated, and insulin was progressively discontinued. The patient maintained stable glycemic control (HbA1c 5,5% or 36,3 mmol/mol) on oral therapy alone over 2 months. No signs of severe insulin-resistance (acanthosis nigricans or dyslipidemia) were observed before metformin therapy.
Discussion:
This case illustrates the complexity of pediatric diabetes, where insulin resistance syndromes may mimic T1D. A prolonged partial remission with preserved endogenous insulin production and low insulin requirements, despite the presence of ?-cell antibodies should prompt genetic investigation. Identifying an INSR variant can suggest alternative diagnosis and allow tailored management with insulin sensitizers rather than exogenous insulin.

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Clinical case | 10: Other - Rheumatology

The boy with the pulmonary nodules

BACKGROUND Granulomatosis with polyangiitis (GPA, formerly Wegener's granulomatosis) is a necrotizing vasculitis affecting small to medium-sized vessels. Usually the disease affects upper airways, lungs and kidneys. GPA is frequently associated with anti-neutrophil cytoplasmic antibodies (ANCA), but seronegativity does not exclude the diagnosis.
CASE PRESENTATION A previously healthy 15-year-old boy presented with pleuritic chest pain, exacerbated by deep inspiration and thoracic torsion. Physical examination showed unilateral pulmonary crepitations without respiratory distress and normal oxygen saturation. Laboratory evaluation revealed marked eosinophilia, and hypergammaglobulinemia without cytopenias. B-T-cell analysis indicated normal T-cells but impaired B-cell maturation. Autoantibody screening, including ANCA, was negative. Chest X-ray revealed multiple lung nodules. Thoracoabdominal CT showed diffuse pulmonary nodules, disseminated lymphadenopathy, and hepatosplenomegaly. After an inconclusive transbronchial biopsy, a partial lobectomy was performed. Histopathology demonstrated necrotizing granulomas and non-necrotizing lymphocytic vasculitis. Extensive microbial, mycobacterial, viral, and fungal testing, including serology for Bartonella, Brucella, Coccidioides and Toxoplasma, was negative. Bone marrow aspirate excluded malignant infiltration. Genetic testing identified a potentially dominant-negative heterozygous ADA2 missense variant. Analysis of ADA2 enzyme activity is pending. Nonetheless, granulomata have not been described in DADA2. Considering the clinical presentation, histopathologic findings, and negative infectious work-up, the most likely diagnosis was GPA. Treatment with oral corticosteroids and rituximab led to rapid clinical improvement, with follow-up CT one month later showing regression of pulmonary nodules.
CONCLUSION We report a rare pediatric case suggestive of GPA, presenting with thoracic pain with on further imaging diffuse pulmonary nodules. The diagnostic challenges in this case included ANCA negativity—seen in 10–20% of GPA patients—and the incidental identification of a genetic ADA2 variant without clinical correlation. This case exemplifies the intricate diagnostic landscape, where oncologic, infectious, and immunologic possibilities must be considered, emphasizing the value of multidisciplinary expertise in complex pediatric scenarios.

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Clinical case | 10: Other - Dermatology

When Blisters Mislead: Clinical Presentation and Diagnosis of Linear IgA Dermatosis in children. Case report and review of the literature.

Abstract
Linear IgA dermatosis (LAD), also Chronic bullous disease of childhood (CBDC), is a rare autoimmune blistering disorder occuring both in children and adults. Despite its low overall incidence of 0,25-1,0 cases per million per year, it remains the most common autoimmune blistering disorder in children. LAD is characterised by subepidermal immunoglobulin A (IgA) deposition at the basement membrane zone, leading to peripheral vesiculation. Because its clinical manifestation may mimic common pediatric conditions such as impetigo or varicella, diagnosis is frequently delayed. Early recognition is crucial to prevent unnecessary antimicrobial exposure and to initiate appropriate therapy.
We report the case of a 2-year-old boy presenting with rapidly progressive, pruritic blistering and erosive lesions, initially treated as impetigo and subsequently as suspected varicella infection. Despite treatment, the patient continued to develop new lesions. Upon transfer to a tertiary center, the polymorphic nature of the eruption and the presence of annular vesicles with a typical “string-of-pearls” configuration raised suspicion for LAD. Histopathologic examination of punch biopsies revealed subepidermal blistering with neutrophil-rich infiltrates. Direct immunofluorescence showed strong, linear IgA deposition along the dermo-epidermal junction, confirming the diagnosis. Following discontinuation of antibiotics, treatment with potent topical corticosteroids resulted in rapid stabilisation, drying of existing lesions and complete cessation of new blister formation.
This case report underscores the diagnostic challenges of LAD in young children, particularly when superimposed bacterial colonisation obscures the clinical presentation. In addition, it reviews the literature outlining key clinical and immunopathologic features that support differentiation between LAD and other pruritic blistering dermatoses in childhood. Finally, it emphasises the importance of targeted biopsies and direct immunofluorescence, underscoring the pivotal role of IgA deposition in establishing a definitive diagnosis.

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My PhD in 300 sec | 2: Neonatology – pediatric intensive/emergency care

Studying antibiotic tissue distribution using microdialysis: from piglets to critically ill children.

For most antibiotic therapies, the target site is outside the plasma compartment and located in the tissue. The lack of knowledge concerning the influence of growth, development and disease-related factors on the tissue distribution of antibiotics complicates the prescription of antibiotics in children. Especially children that are critically ill could be at risk for underdosing and subtherapeutic target site concentrations if dosing is only guided by the drug concentrations in plasma. This hypothesis was based on data from adult research, as no tissue pharmacokinetic (PK) data had been gathered in critically ill children yet. However, tissue PK research is practically and ethically more challenging than performing PK research in plasma. Microdialysis is currently considered the gold standard technique for studying drug disposition in the interstitial tissue compartment.
This research project aimed to investigate the influence of critical illness on antibiotic tissue distribution in children, using piperacillin-tazobactam, as model compound. An experimental protocol to measure piperacillin and tazobactam in muscle tissue was optimized with the use of in vitro and in vivo experiments in septic and healthy piglets and critically ill children admitted to the pediatric intensive care unit (PICU). Population PK modelling demonstrated a lower tissue penetration of piperacillin in septic piglets compared to healthy piglets. The study in critically ill children is currently still ongoing, but preliminary results show a reduced antibiotic tissue penetration in this population as well. Interestingly, both in the piglet and pediatric study, tazobactam distributed more easily into the tissue. This stands in contrast to the belief that beta- lactamase inhibitors and their accompanying beta-lactam antibiotics have similar PK properties.
The results and experiences from these pilot studies should encourage researchers and clinicians to set-up more large scale tissue PK studies on piperacillin-tazobactam and other important antibiotics in this population. As tissue PK data is currently only obtained in research settings and plasma concentrations are readily available, future studies should focus on identifying predictors for the extent of drug penetration from plasma to tissue.

Eline Hermans, Mathias Devreese, Peter De Paepe, Pieter De Cock

My PhD in 300 sec | 5: Oncology – hematology

Dynamic monitoring and risk assessment of fatigue in survivors of childhood cancer

BACKGROUND:
Survival after childhood cancer now exceeds 80%, yet many childhood cancer survivors (CCS) live with persistent, burdensome fatigue. Fatigue is multidimensional, time-varying, and reflects interacting psychosocial, behavioral, and biological factors. Despite its impact, mechanisms remain insufficiently understood. This dissertation examined modifiable contributors and biological underpinnings, and explored dynamic assessment and risk stratification.
METHODS:
Two studies: (1) LInC (n=110 CCS, 14–25 years, two annual assessments) and (2) DREAM (n=90 CCS followed for one year with repeated questionnaires, cardiopulmonary exercise testing, blood biomarkers, and ecological momentary assessment (EMA) with Fitbit). Fifty-five healthy controls (HCs) were included for biomarker and fitness comparisons. Across five aims: (i) longitudinal links between distress, resilience, and fatigue; (ii) modifiable contributors (sleep, fitness) and CCS–HC differences; (iii) real-time fatigue dynamics via EMA+actigraphy; (iv) a systematic review of fatigue-related biomarkers; and (v) biomarker analyses in CCS vs HCs, links to fatigue, and clustering.
RESULTS:
Fatigue was highly prevalent, multidimensional, and shaped by psychological, behavioral, and biological factors. Fear of recurrence and post-traumatic stress predicted higher fatigue over 1-year; resilience related to lower concurrent fatigue but did not buffer the negative impact from distress on fatigue. CCS reported higher fatigue than HCs, with poor sleep and reduced fitness as strong contributors. Real-time data showed within-day fluctuations: fatigue rose after shorter-than-usual sleep, lower pre-beep activity, and higher tension, independent of prior fatigue. The review linked fatigue to inflammatory cytokines, HPA-axis dysregulation, oxidative stress, and neurotrophic changes. Biomarker analyses showed CCS–HC differences and two CCS subgroups (Inflammatory vs Glial-Associated) with similar fatigue.
CONCLUSION:
Fatigue in CCS is dynamic and multifactorial. Integrating longitudinal measures, real-time monitoring, and biomarker profiling yields a more nuanced picture than static assessments. Clinically, routine screening for distress, sleep, fitness, and activity, plus biomarker-informed phenotyping, can guide tailored support. Apps and wearables may enable real-time, personalized management to help preserve quality of life and long-term functioning.

Deveny Vanrusselt, Charlotte Sleurs, Jurgen Lemiere, Sabine Verschueren & Anne Uyttebroeck

My PhD in 300 sec | 5: Oncology – hematology

The impact of radiotherapy on the developing brain and long-term cognitive outcomes in survivors of a pediatric brain tumor.

Advances in the treatment of pediatric brain tumors have improved survival, resulting in a growing group who experience various late effects. Cognitive impairment is among the most common ones and can substantially affect quality of life. The neurotoxic mechanisms underlying tumor- and treatment-induced cognitive impairment are complex and involve multiple cell types within the brain. With MRI, markers of neurotoxicity can be assessed, revealing structural and functional brain changes. However, the extent of induced toxicity, regional vulnerability, and long-term alterations remains uncertain. Therefore, the overall aim is to evaluate the impact of radiotherapy on the developing brain and cognitive outcomes, and to explore interventions to alleviate persistent cognitive impairments.
Two cohorts of survivors and matched controls were included. One survivor group comprised 21 survivors of posterior fossa tumors and one comprised 50 survivors of tumors located in various locations. All participants completed daily-life functioning questionnaires, a comprehensive cognitive test battery, and an MRI protocol assessing multiple cognitive domains and both anatomical and functional brain features, resp. Radiotherapy dose maps were calculated for the second cohort. Additionally, a systematic literature review examined potential interventions for cognitive impairments.
Survivors showed cognitive impairment in several domains, including working memory, processing speed, and overall intellectual ability. They also demonstrated widespread imaging alterations. Multiple cortical regions showed lower grey matter volume and preliminary analyses suggested lower blood perfusion. Structural brain networks showed lower clustering coefficients, indicating more segregated networks. Both cognitive impairment and structural brain alterations were more pronounced in survivors who had received radiotherapy. Network hubs appeared in similar anatomical locations across groups, but their relative importance differed. Hubs exhibited a higher frequency of organizational alterations, which were more strongly associated with cognitive performance. Based on the review, several interventions have shown short-term improvements in cognition, but their long-term maintenance remains uncertain.
Cognitive impairment and brain alterations occur in survivors, which are more pronounced after radiotherapy. The next step is to identify regional vulnerabilities to RT and guide targeted strategies.

Prof. dr. Sandra Jacobs
Prof. dr. Jurgen Lemiere
Prof. dr. Charlotte Sleurs

My PhD in 300 sec | 8: Nephrology

Molecular Mechanisms of Sickle cell Nephropathy: Beyond Apolipoprotein L1-Mediated Podocyte Damage

Introduction: Sickle cell disease (SCD) is an inherited hemoglobinopathy that severely impacts global health. A major complication driving morbidity and mortality is sickle cell nephropathy (SCN), which starts in childhood and progresses to kidney failure in up to 20% of patients by early adulthood. However, the molecular mechanisms remain poorly understood. Recent data suggest that factors beyond the SCD mutations as well as direct podocyte damage are involved in SCN progression.
Methods: This study utilized an integrated approach combining in vitro experiments with a clinical study to investigate mechanisms underlying SCN.
Results: We observed that markers of kidney damage were common in children with SCD and were associated with clinical variables (e.g., frequent transfusions and elevated indirect bilirubin) and genetic factors, such as apolipoprotein L1 high-risk genotype (APOL1 HRG: G1/G1, G1/G2, or G2/G2) and long GT-dinucleotide repeats in the heme oxygenase-1 (HMOX1). Mechanistically, we demonstrated that APOL1 variants showed dynamic transport towards the plasma membrane via actin filaments where they formed non-selective cation channels permeable to extracellular Na^+ and $Ca^{2?}$, with risk variants, G1 and G2, exhibiting higher basal channel activity and increased cytotoxicity. Furthermore, we identified a novel genetic interaction between APOL1 and HMOX1, the gene encoding the cytoprotective enzyme, HO-1. Children carrying APOL1 HRG were more likely to bear HMOX1 long (GT)n repeats, which are known to reduce HO-1 expression. The functional loss of HO-1 led to increased APOL1 expression and consequent cytotoxicity in podocytes, while the knockout of APOL1 did not affect HO-1, suggesting a unidirectional regulatory mechanism. Finally, we established that children with SCD lose podocytes into their urine. These cells were viable, maintained typical podocyte marker expression, and expressed beta-globin. Proteomic profiling of SCD podocytes revealed dysregulated oxidative phosphorylation, neutrophil degranulation, and iron metabolism pathways. Functionally, these SCD podocytes exhibited elevated baseline levels of reactive oxygen species and impaired adhesion.
Conclusion: These findings highlight that SCN is a complex condition influenced by genetic factors like APOL1 and HMOX1, which could pave the way for targeted therapeutic options. Crucially, the findings suggest that podocyte dysfunction is a primary driver of kidney injury in SCD.

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My PhD in 300 sec | 9: Endocrinology

Navigating endocrine care in transgender adolescents: the challenge of sexual dimorphism

Background: Transgender/gender diverse (TGD) adolescents experience incongruence between gender and sex at birth (SAB), which can cause significant distress and require medical interventions to align physical traits with those typical for gender. Sexual dimorphism poses challenges to this. Also, evidence on long-term outcomes of early medical intervention remains limited. This doctoral research aimed to investigate the effects of pubertal suppression (PS) and subsequent gender-affirming hormone therapy (GAHT) on several sexually dimorphic outcomes.
Methods: Some studies were retrospective, while others prospective (cross-sectional). Outcomes analyzed: activity of the Pediatric Gender Team of Ghent University Hospital since its constitution, effects of early and prolonged PS with GnRH analogues on physical outcomes, evaluation of long-term outcomes after 5-10 years of GAHT on physical and mental outcomes. A dedicated module was developed within the multicentre European registry EuRREB to enhance international collaboration and standardization of care.
Results: Over 15 years, 890 minors accessed our gender clinic. Early and prolonged GnRHa treatment (~3 years) decreased BMD z-scores (mainly at lumbar spine), and lean mass, while fat mass increased. Handgrip strength improved compared to cisgender girls, but decreased compared to cisgender boys. Final height remained consistent with target height for SAB. Long-term GAHT (5–10 years) yielded age-appropriate BMD z-scores and a shift of body composition towards values typical for gender. Handgrip strength approached cisgender male values in trans men; trans women had intermediate results. Lipid profile alterations occurred in overweight/obese participants. Cardiac function was largely normal, but GAHT increased aortic stiffness. Voice characteristics aligned with gender for trans men, while showed intermediate values for trans women; earlier GnRHa initiation preceding GAHT in trans women correlated with more feminine-sounding voices. Overall life satisfaction and self-rated health were good.
Conclusion: Early medical gender-affirming interventions in TGD adolescents are effective in promoting a partial or complete reversal of sexually dimorphic traits, while being overall safe for bone and metabolic health. The effects on cardiovascular function need further investigation. These findings support evidence-based pediatric transgender care and highlight the need for ongoing long-term, multicentre research.

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science | 5: Oncology – hematology

Close Follow-Up of Patients with Neurofibromatosis Type 1 Reduces the Incidence of MPNST

Background/Objectives

Neurofibromatosis type 1 (NF1) patients have an increased risk for benign and malignant neoplasms, leading to increased morbidity and mortality. Of these, malignant peripheral nerve sheath tumours (MPNSTs) are the most common malignant neoplasms causing death in NF1 patients. MPNSTs mostly originate from pre-existing plexiform neurofibromas (PNs). Many MPNSTs first pass through the premalignant stage of atypical neurofibromatous neoplasm with uncertain biologic potential (ANNUBP). With this study we aimed to test whether active surveillance in adults with NF1 changes the natural history of MPNST development. More specifically we wanted to evaluate the hypothesis that early detection of peripheral nerve sheath tumours (PNSTs) suspected for ANNUBP can lead to timely surgical removal of ANNUBPs, which in turn might reduce the incidence of MPNST in NF1 individuals.

Methods

We retrospectively collected data on NF1 patients who were under surveillance with whole body diffusion-weighted magnetic resonance imaging (WB-DW/MRI or DWI) and clinical exams at University Hospitals Leuven (UZL) or in one of the UZL network hospitals between 2012 and 2022 and who were 16 years or older at the time of their first WB-DW/MRI. The expected number of MPNST cases was calculated based on prior population-based studies, with statistical comparison using Poisson and Binomial distributions.

Results

We included 276 patients with a total observation period of 1329.2 person-years. In total, 65 surgical interventions were performed in 58 individuals (21% of the cohort). WB-DW/MRI was followed by surgical intervention in 15.5% of the cases. We diagnosed 15 ANNUBPs in 14 patients. No cases of MPNST were observed against the expected 3.96 cases (p=0.019).

Conclusions

Active surveillance, incorporating WB-DW/MRI and timely surgical interventions for ANNUBP, significantly reduced the incidence of MPNST in this cohort.

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