

Infections in the time of the pandemic

The COVID-19 pandemic is an evolving natural experiment. There has been an unexpected windfall in this time of despair. Researchers from the Boston Children's Hospital have analyzed the rates of 12 common childhood infections in the same calendar period during 'social distancing' and in the 'pre-social distancing era,' using data of a primary care network which caters to 375,000 children. The infections they studied were acute otitis media (AOM), bronchiolitis, common cold, croup, gastroenteritis, influenza, nonstreptococcal pharyngitis, pneumonia, sinusitis, skin and soft tissue infections (SSTIs), streptococcal pharyngitis, and urinary tract infection (UTI). All infections showed a remarkable decline. Influenza, croup and bronchiolitis practically disappeared. The least decline was in the rates of UTI, which was as expected.

The decline in infections may have been due to decrease in prevalence or a choice not to seek medical care. However the trends of change in UTI suggest that the former was more predominant. It may give good pointers in developing strategies to reduce common childhood infections after the pandemic is resolved.

(Pediatrics 2 September 2020)

Deconstructing motherhood

Where in the brain is the center for nurturing? Catherine Dulac, a molecular biologist at Harvard, has won \$3 million dollars as part of the Breakthrough Prize for work in this esoteric field. She has discovered the neural circuits which explain the unique parental behaviors in males and females. Close observation in mice showed that female mice show remarkable stereotyped behaviors when they see baby mice. Even when they are not the mother, they immediately retrieve the pups, groom them, build a nest for them and crouch around them. In sharp contrast in normal circumstances, male mice will attack baby mice.

Dulac's group found that the medial preoptic area of the hypothalamus releases a molecule called galanin which orchestrates the various parenting behaviors. Stimulating the galanin neurons with light caused the male mice to show unusual maternal parenting behaviors. Destroying the preoptic areas in females resulted in non-nurturing behaviors in females.

The work is extraordinary because it is the first time such a complex social behavior like parenting has been explored to the cellular level. The biological underpinnings of social behaviors may open doors to therapeutics in many complex problems like post-partum depression, drug addiction and criminality.

(Nature News 10 September 2020)

Treading softly - CONSORT-AI guidelines

Artificial intelligence (AI) systems are sweeping across the landscape of medicine. And we stand mostly unprepared. Recently there has been a spate of randomized controlled trials

using AI systems for diagnosis, but are these RCTs designed appropriately factoring in the complexities of AI and can we take their evidence at face value?

Guidelines for clinical trial protocols evaluating interventions with an AI component (SPIRIT-AI) and trial reports with AI (CONSORT-AI) have recently been published. One of the issues is random alerts by AI algorithms which will falsely over detect abnormalities compared to a clinician and be labelled as 'better'. Another major issue with AI are that many systems are self-learning and continually changing. Further the people who create the algorithms are not the clinicians who see patients. So they need to have a deeper understanding of medicine and clinicians need to have a better understanding of what these algorithms may or may not handle. The new guidelines have asked for clear detailing of the type of AI model being used, which version of the algorithm will be used, specific plans to identify and analyze performance errors etc.

Some paths in medicine are so byzantine, that even 'angels would fear to tread'. And the guidelines to rein in AI in medicine are certainly one of them.

(BMJ 9 September 2020)

AAP guidelines for resistance training in children

It is well established that muscular fitness in children is declining worldwide. On the other hand, competitive training in sports is starting at earlier ages and resistance training for body image development is not uncommon in some children.

The American Academy of Pediatrics has brought out guidelines to help pediatricians counsel parents in this regard. Resistance training/weights is now considered to have several benefits even in children e.g., improvements in motor skills, enhancement of bone mineral density and reduction in injuries. Supervision under a trainer is preferred. Children recover quickly from resistance training fatigue, hence shorter resting periods of 1 minute between sets initially and 2-3 minutes later is recommended.

Pre-habilitation is a term used for children in competitive sports. It means prophylactic exercises to prevent injuries. The other technique is plyometric exercises. This involves repetitive concentric exercises to rapidly build strength. Children as young as five can build strength with one-legged hops or frog jumps. For older children, lifting weights can be combined with aerobics or other sports to round out their activities. Children with uncontrolled hypertension may need prior medical evaluation.

The AAP also recommends 1-2 days off per week to prevent injuries due to over training. We also need to make sure that children take adequate fluids and calories required for the increased expenditure.

(Pediatrics June 2020)

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