

# THE BIG LITTLE NEWSLETTER FOR THE STUDY ON THE PREVENTION OF CARDIOVASCULAR DISEASE AND TYPE 2 DIABETES IN CHILDREN AND ADOLESCENTS



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## Research results overview

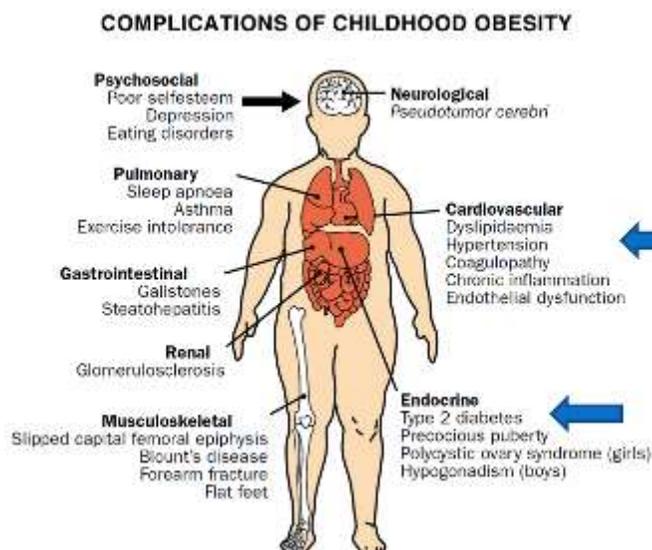
For more than 10 years now the Quality study has gathered and analyzed a colossal amount of data. It is impossible to share with you all that has been undertaken, yet some of you were present for the Family Day of Scientific Sharing that was held on June 3rd 2017, during which some items were discussed. In case you were not able to attend, a few of the highlights are presented here.



## Summary of presentations

### Presentation by Dr Mélanie Henderson MD, Ph.D.

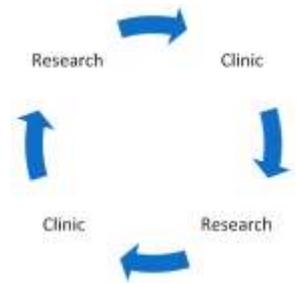
This presentation offers insight into the profile of the individuals that make up the Quality cohort. Covering a little over 10 years, the visits 1, 2, and 3 of the study have provided data for respectively 630, 564, and 377 participants. For now, the majority of analyses have focused on the information gathered with visits 1 (subjects aged 8 to 10) and 2 (subjects aged 10 to 12), since many parts of the data from visit 3 are still being validated.



The Quality study mainly examines the consequences of obesity, in other words the factors influencing diabetes and cardiovascular problems. The key idea in Dr Henderson's presentation is that in the Quality cohort, establishing and maintaining a very active lifestyle early on in life (from the ages of 8 to 10 years old) predicts better cardiometabolic health when youths enter puberty. Indeed more physical activity and less sedentary time (especially time spent sitting in front of a screen) are linked to reduced adiposity (fat percentage). This reduction of adiposity favours a heightened insulin sensitivity and reduces the secretion of this hormone (two factors in the development of type 2 diabetes).

## Summary of presentations ... continued

Dr Henderson also underlines the utmost importance of research in clinical practice, arguing that the Quality study has served as basis for the creation of Sainte-Justine UHC's CIRCUIT centre (pediatric centre of intervention in cardiovascular prevention and readaptation). Further, having clinical experience with patients pushes one to strive for better solutions for their health and that is why it is pivotal to pursue our research.



### Presentation by Tracie Barnett Ph.D.



This paper reveals some results concerning the influence of physical environments on the health of the participants in the Quality study. For example the weight of youths, a key factor of health, has been linked to the built environment: certain neighborhoods, because of their inherent features, seem to favour obesity. Thus in order to identify these factors the neighborhood and school of participants were evaluated and described in some capacity. In 2008, 512 neighborhoods were examined onsite, and in 2016 another 400 neighborhoods were again characterized, this time using Google Street View. By analysing the built environment in which participants live, the neighborhoods were classified according to certain indicators (aspects reducing traffic, aspects facilitating pedestrian activity, aspects tied to social unrest, etc.), and hypotheses were tested to determine if these indicators influence healthy habits such as physical activity. The goal is to better understand which indicators are the ones that have an effect on behaviors, so as to then propose ways of bettering the built environment and boost the indicators favouring healthy lifestyle habits. Let's take parks, for example. The public parks of your neighborhoods were evaluated according to 9 categories, including size, aesthetics, presence of pools and of designated sports areas, presence of graffiti, etc. Then we assessed the manner in which these categories are linked to physical activity and to trunk fatness (percentage of fat). The participants of the Quality study living in neighborhoods providing parks equipped with pools, parks presenting a variety of playgrounds, large parks with bicycle paths, and parks that are deemed aesthetically pleasing, actually say they do more physical activity, and this seems to be linked to reduced trunk fatness.

### Presentation by Vicky Drapeau, Ph.D.

This paper presents some of the nutritional behaviors and habits of the participants in the Quality study, in relation with body weight, weight gain, and metabolic health. One of the behaviors under scrutiny is the night eating syndrome (NES), which is described as combining delayed food intake, night-time food intake, and being seriously preoccupied by such eating behaviors. This eating disorder is linked to obesity and to metabolic complications. Since it has seldom been studied in youths, there was an opportunity for us to analyse the data gathered through the Quality study. The main results of the inquiry are that very few parents/children of the Quality cohort qualify as having all of the criteria for NES, but some of them do have more symptoms than others. Mothers and fathers that experience more NES symptoms than others have a higher body mass index. In fathers, the same increased number of symptoms is correlated to a larger waistline and to higher blood levels of fat.

## Summary of presentations ... continued



Parents that admitted habits of “eating at night” and “not being hungry in the morning” gained more weight between visits 1 and 2 than those that did not report such habits. Following the analysis of certain data it was determined that the “Night Eating Questionnaire” is a valid tool to evaluate evening/overnight food intake in children, but that it is preferable to combine it with a 24-hour diet recall. It was found that children having more NES symptoms also are more active, specifically in the evenings. Children scoring high on the Night Eating Questionnaire eat foods that are richer in fat, in salt, and they eat less fruits and vegetables, and the snacks they eat have lesser nutritious value. These preliminary analyses have allowed us to assess certain questions, yet they also raise other issues that will require us to adjust our questionnaires in the future.

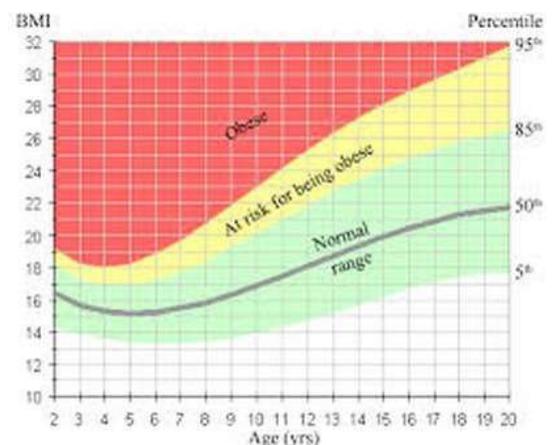
Another item that was touched upon is the habit of eating yogurt. This food’s composition (yogurt is high in protein, calcium, vitamin D, and lactic bacteria) may favour weight control and metabolic health. The data of the Quality study demonstrates that children that are at risk of weight surplus/obesity (that is, having 2 parents that are overweight or obese) and that eat yogurt have a similar waistline to that of children not at risk (none of the parents of these present weight surplus or obesity). Such results suggest that eating yogurt is more beneficial to children at risk of weight surplus/obesity than to children presenting a lesser probability of weight surplus or obesity.

### Presentation by Lisa Kakinami Ph.D. and Philippe Boileau



Two topics are covered here. The first concerns the best way to evaluate the body composition in children, which is a determining factor of health. Because excess fat at the waistline is linked to several health issues it is useful to be able to identify early on which individuals are at risk of developing these problems. The best way to measure adiposity (percentage of body fat) is by the dual-energy X-ray absorptiometry method (DXA). However the use of this method is rather restricted to hospitals because of the required equipment. Using the body mass index (BMI) can be a legitimate alternative to DXA, since BMI is the most commonly used measure of body composition (all that is needed to calculate it is one’s weight, height, and the simplest of calculators). This

method is therefore quick and economical. Usually a child’s BMI will be compared to that of children of the same age and sex by setting it against a percentiles curve (0 to 100). But if we want to determine whether there is a change in BMI over time in order to quickly identify youths that are gaining too much (or not enough) weight, then the percentiles method seems to lack in precision. This has been shown by comparing the Quality cohort’s DXA results both with the BMI percentiles and with the BMI basic measurements ( $\text{kg}/\text{m}^2$ ). The BMI change over time using basic BMI measurement ( $\text{kg}/\text{m}^2$ ) is more closely correlated to DXA results (most precise method). Thus, to evaluate the change of BMI in youths over time, as in the Quality study (comparing individuals aged 8 to 10 years old with the same individuals once they reach 10 to 12), it is best to use the basic BMI measurement ( $\text{kg}/\text{m}^2$ ).

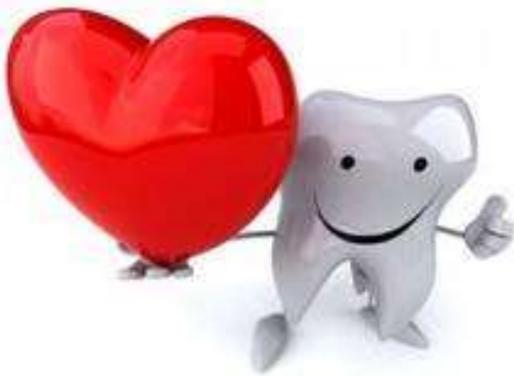


## Summary of presentations ... continued

The second component of this presentation concerns nutrition and blood pressure. More specifically: is there a link between dairy products and blood pressure in children? This was investigated by using the data of the Quality cohort that completed their food journal (3 days) upon the first visit, 610 participants in all.

A difference emerges when the youths eating the least dairy products among the cohort are compared to those eating at least the minimum required by the Canada Food Guide (for children aged 8 to 10, two portions of milk, yogurt, or cheese are recommended daily). On average, the systolic blood pressure of those following the Guide's recommendations is lower by 2 mmHg, and their diastolic blood pressure is lower by 1 mmHg. We conclude that the analyses made have found no link between blood pressure and calcium, magnesium or potassium intake, suggesting that the influence of eating dairy products on blood pressure is not tied to these micronutrients. However it has been demonstrated that eating two portions of dairy products per day reduces blood pressure in youths, as in adults, a desired effect.

### Presentation by Belinda Nicolau Ph.D.



This paper explores the oral health component of the Quality study. The data concerning tooth caries, gum health, dental plaque, gingival crevicular fluid, and saliva samples, were used to see if, as in adults, there exists a link between poor oral health and many diseases (diabetes, lung disease, heart disease). Both the obesity and metabolic syndrome present in the boys of the Quality study look indeed to be tied to periodontal disease (TNF-alpha levels in the gingival crevicular fluid). Both the obesity and metabolic syndrome present in the boys of the Quality study look indeed to be tied to periodontal disease (TNF-alpha levels in the gingival crevicular fluid).

It is also observed that participants whose parents have a lower income suffer more caries and that conversely, participants stemming from wealthier families are more subject to dental traumas (injuries). Furthermore, it is evidenced that living in a comfortable neighborhood combined with having access to school programs that both promote better eating habits and dental health reduces caries in pupils.



What should be emphasized, then, is that a better understanding of the adverse effects of obesity on the mouth's health, such as gum disease, can help dentists to control and treat their patients in timely fashion. In the same way, understanding the link between metabolic syndrome and gum inflammation can help identifying children at risk earlier on, and providing them with preventive treatment. As for the results concerning the school environment, they can help to plan efficient public health interventions to prevent dental disease and thus reduce social inequities in oral health.

**Members of the Quality team**

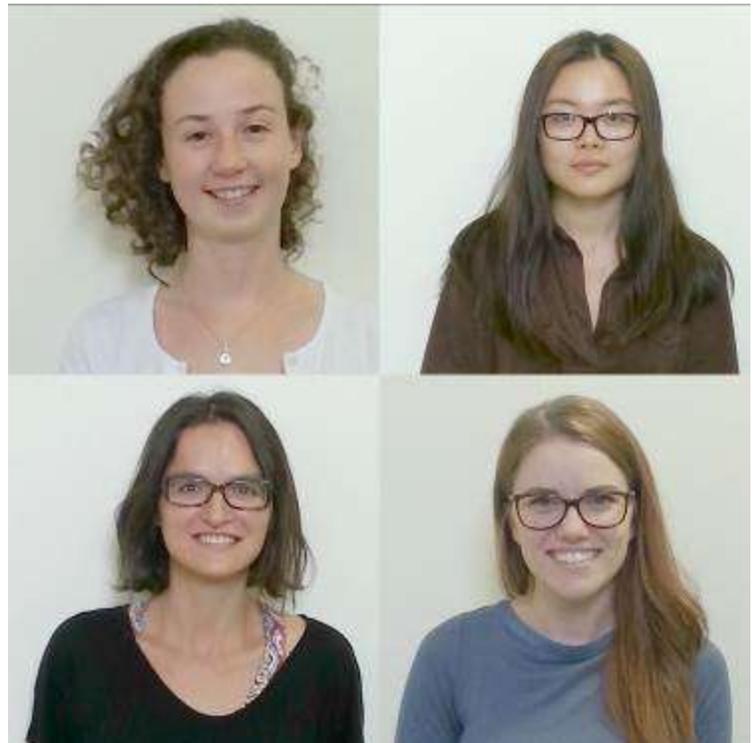
We take advantage of this issue to introduce some of the members of the Quality team. We are truly blessed to be working with dynamic, talented, and resourceful people.

**Sarah Bonin**, research intern

**Hui Lin Zhang**, research intern

**Gabrielle Simoneau**, research biostatistician

**Myriam Leclerc**, research assistant



**Thanks to all participants**

And to you, dear participating families! We thank you for your diligent involvement in this research over all the years!

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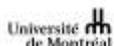
**Our partners and funding agencies**



**Ours reasearchers' affiliations**



**CHU Sainte-Justine**  
 Le centre hospitalier  
 universitaire mère-enfant  
 Pour l'amour des enfants



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