



# Importance of Nutrition and Exercise

MEGAN MORRISON, RD, BSCH  
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**SickKids**<sup>®</sup>

**22q**  
The Dalgligh Family  
22q Clinic

**UHN** Toronto General  
Toronto Western  
Princess Margaret  
Toronto Rehab

# Outline



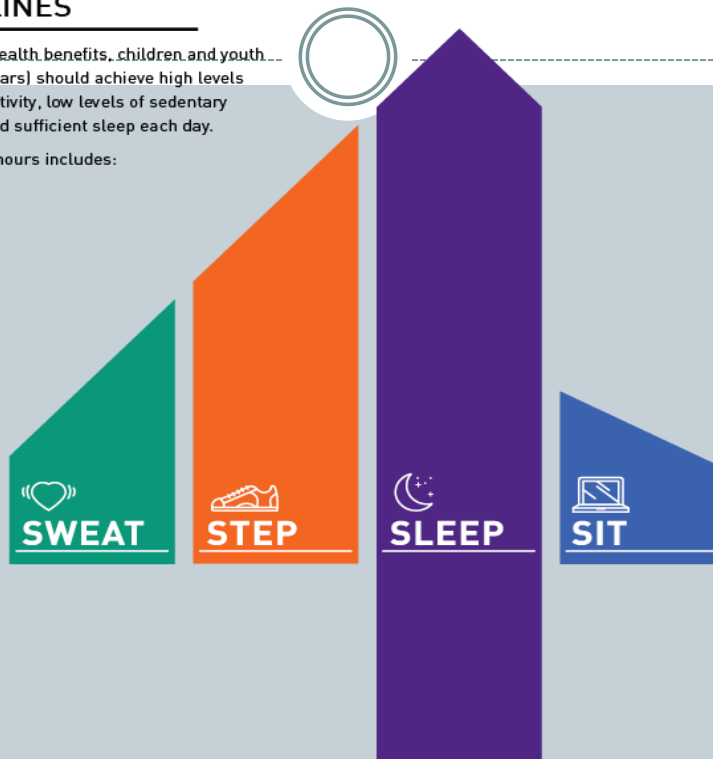
- Welcome remarks
- Physical activity guidelines
- Benefits to physical activity
- Body weight classification
- Nutrition and 22q11.2DS
  - Recommendations for managing nutrition impact symptoms
- Obesity and 22q11.2DS
- Healthy living recommendations
- Questions

# Canadian 24-hour movement Guidelines for Children and Youth

## GUIDELINES

For optimal health benefits, children and youth (aged 5–17 years) should achieve high levels of physical activity, low levels of sedentary behaviour, and sufficient sleep each day.

A healthy 24 hours includes:



### SWEAT

#### MODERATE TO VIGOROUS PHYSICAL ACTIVITY

An accumulation of at least 60 minutes per day of moderate to vigorous physical activity involving a variety of aerobic activities. Vigorous physical activities, and muscle and bone strengthening activities should each be incorporated at least 3 days per week;

### STEP

#### LIGHT PHYSICAL ACTIVITY

Several hours of a variety of structured and unstructured light physical activities;

### SLEEP

#### SLEEP

Uninterrupted 9 to 11 hours of sleep per night for those aged 5–13 years and 8 to 10 hours per night for those aged 14–17 years, with consistent bed and wake-up times;

### SIT

#### SEDENTARY BEHAVIOUR

No more than 2 hours per day of recreational screen time; Limited sitting for extended periods.

Preserving sufficient sleep, trading indoor time for outdoor time, and replacing sedentary behaviours and light physical activity with additional moderate to vigorous physical activity can provide greater health benefits.

# Physical Activity Guidelines for Adults



## Age 18-64

- 150 minutes (2 1/2 hours) of moderate to vigorous aerobic physical activity/week
- **10 minute** intervals or more at one time
- 2 days of muscle and bone strengthening

\* Connect with your medical team before starting any new activities

# Physical Activity – Get Moving!



## Aerobic

- Jogging
- Brisk walking
- Swimming
- Biking
- Skiing
- Exercise cardio class at a gym



## Muscle and bone strengthening

- Weight training
- Pilates
- Yoga
- Stretching

## The Exercise Pill...



**“To treat your high blood pressure, diabetes, hyperlipidemia, osteoporosis... take this new pill every day. Take it out for a jog, then take it to the gym, then take it for a bike ride...”**

# Benefits of Regular Physical Activity



## Children and Teens

**60 minutes** of activity each day may help:

- Improve health
- Improve fitness
- Maintain a body weight
- Improve self confidence
- Increase happiness
- Learn new skills
- Social activity

# Benefits of Regular Physical Activity



## Adults

### Body

May help reduce risk of:

- Type 2 diabetes
- Obesity
- Heart disease
- High blood pressure
- Osteoporosis
- Certain types of cancer

### Mind

- Self esteem
- Confidence
- Mental health
- Strength
- Fitness level





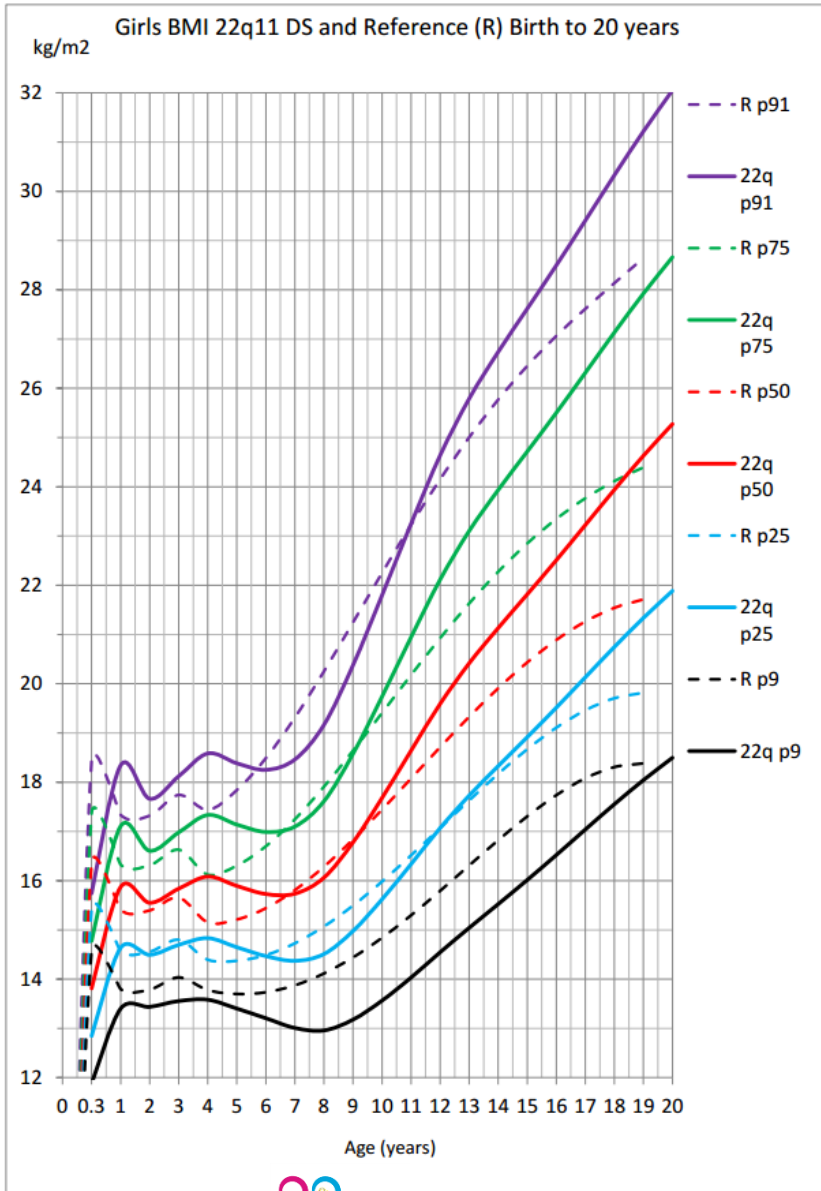
# Canadian Guidelines for Body Weight Classification



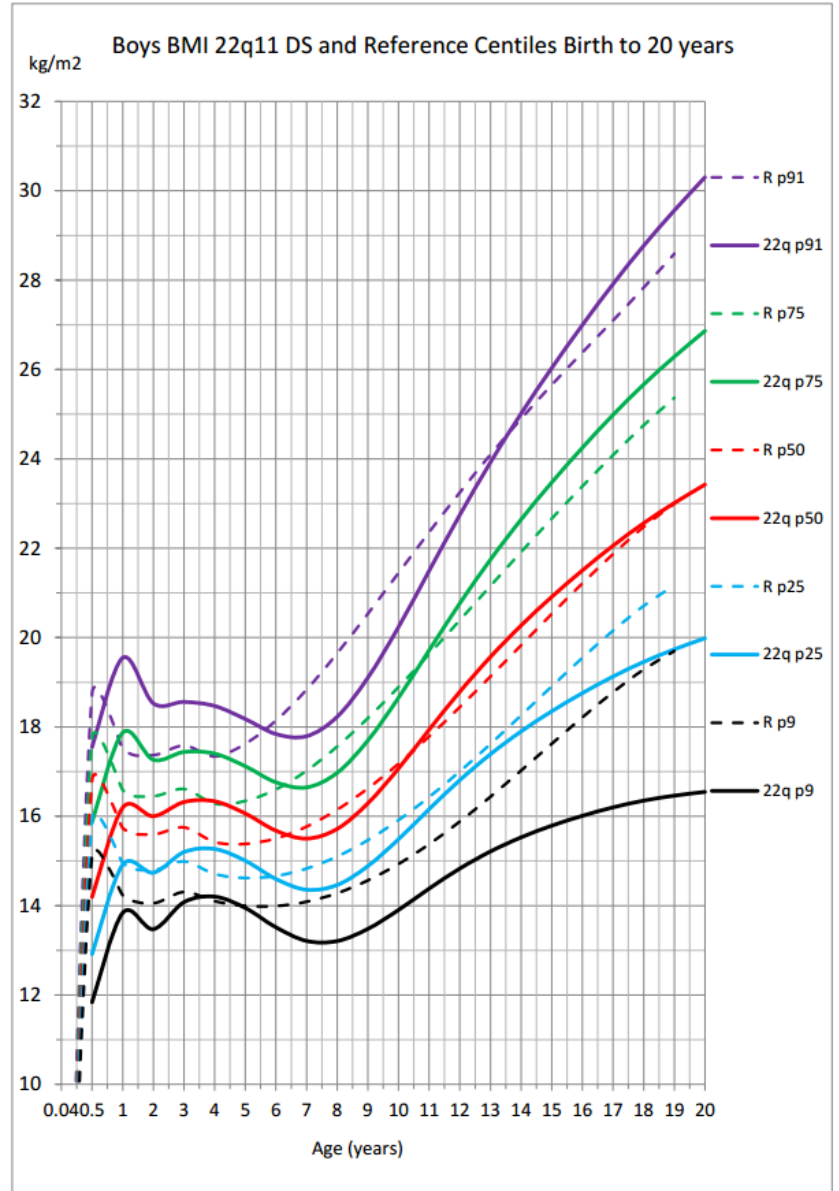
## Children and Adolescents < 18 years old

Percentile Ranking	Weight Classification
Less than 5 <sup>th</sup> percentile	Underweight
5 <sup>th</sup> percentile to less than 85 <sup>th</sup> percentile	Healthy weight
85 <sup>th</sup> percentile to less than 95 <sup>th</sup> percentile	Overweight
Equal to or greater than the 95 <sup>th</sup> percentile	Obese

# Girls BMI Birth to 20 years



# Boys BMI Birth to 20 years



# Canadian Guidelines for Body Weight Classification

**Body Mass Index (BMI)** → Most widely investigated and useful indicator of health risks associated with under and overweight

## Classification for Adults

Classification	BMI Category (kg/m <sup>2</sup> )	Risk of developing health problems
Underweight	<18.5	<b>Increased</b>
Normal Weight	18.5-24.9	Least
Overweight	25.0-29.9	<b>Increased</b>
Obese Class I	30.0-34.9	<b>High</b>
Class II	35.0-39.9	<b>Very High</b>
Class III	≥40.0	<b>Extremely High</b>

# Canadian Guidelines for Body Weight Classification

- **Waist Circumference** → used as an indicator to assess health risks associated with excess abdominal fat

Waist Circumference Cut-off Points		Risk of developing health problems
Men	≥ 102 cm (40 in)	<b>Increased</b>
Women	≥ 88 cm (35 in)	

Risks associated with increased abdominal fat:

- Type 2 Diabetes
- Cardiovascular Disease
- High blood pressure
- Stroke
- High cholesterol levels



# Nutrition and 22q11.2 Deletion Syndrome



- Endocrine abnormalities
  - Hypocalcaemia → low blood **calcium** levels
- Gastroenterological
  - **Constipation**
  - GERD
- Weight management and healthy eating
  - **Obesity**

# Recommendations for Managing Nutrition Impact Features



## Hypocalcemia

- **Vitamin D** supplementation, **2000IU**/day for all adults
- Calcium supplementation as needed
- Recommended dietary reference intake for calcium and vitamin D depends on gender and age
- How to improve **calcium absorption**?
  - Minimize total caffeine intake
  - Minimize pop and “fizzy” drinks, and alcohol intake
  - Lower sodium intake
  - **Space out intake** of calcium throughout the day

# Recommendations for Managing Nutrition Impact Features



## Some examples of calcium containing foods

- **Milk** and milk substitutes, fortified with calcium
- Cheese and **yogurt**
- Sardines, **canned salmon** with bones
- Tofu
- Beans (white, navy) canned or cooked
- **Tahini**
- **Almonds**

# Recommendations for Managing Nutrition Impact Features

## Tips for Managing Constipation

- Increased total **fluid** intake (6 to 10 cups per day)
- Increased physical **activity** (30 minutes 5 days per day)
- Slowly add **fiber** to your diet (25-38 g per day)
- Once your fluid intake is at least 6 cups, add more fiber slowly
- What are some high **fiber** foods?
  - **Whole grain** breads with at least 4 grams fiber/serving
  - Fresh **fruits** and **vegetables** (including the skin)
  - **Bran cereals**, brown rice, barley
  - Dried peas, beans and **lentils**



# Recommendations for Managing Nutrition Impact Features

## Tips for managing Gastroesophageal Reflux Disease (GERD)

- Chew food well and eat slowly
- Sit upright during and after meals, have a healthy body weight

### Avoid:

- Large meals; late meals
- Lying down within 2 hours
- High fat foods that are fried and spicy
- Acidic foods (tomatoes, lemons, limes)
- Garlic, onions and chocolate
- Limit caffeinated drinks, and reduce or stop smoking

# Obesity and 22q11.2 Deletion Syndrome



Genet Med. 2016 Aug 18. doi: 10.1038/gim.2016.98. [Epub ahead of print]

## **Obesity in adults with 22q11.2 deletion syndrome.**

Voll SL<sup>1,2</sup>, Boot E<sup>2,3,4</sup>, Butcher NJ<sup>2</sup>, Cooper S<sup>4</sup>, Heung T<sup>2</sup>, Chow EW<sup>2,3</sup>, Silversides CK<sup>4,5</sup>, Bassett AS<sup>2,3,4,5,6</sup>.

### Questions:

1. Is obesity found at a higher rate in 22q11.2DS?
2. What are factors that may contribute to obesity

# Obesity and 22q11.2 Deletion Syndrome



## Results:

- Average BMI was 29.2 at an average age of 26.7 years
- Obesity rates were significantly **higher** in 22q11.2DS compared to the general Canadian population
  - Even with no antipsychotic medication use
  - Beginning in the **20-34** year old age group
  - Not higher in the 18-19 year age group
- Higher BMI with older **age** or lifetime use of certain medications known to increase risk for weight gain
- Low thyroid and congenital heart disease were **not** factors in obesity

# Obesity in 22q11.2 Deletion Syndrome



## Conclusions

- Obesity is a **common adult** feature of 22q11.2DS
- Weight gain appears to begin **age ~10-12** years and further through adolescence
- Healthy diet and exercise need to **start early!**
  - A dietitian may be helpful
  - Active **monitoring** of weight and metabolic factors
  - Always a balance between the benefits of medication and possible side effects

# Recommendations for Managing Nutrition Impact Features

Healthy weight and healthy eating

- **Regular** timed meals and snacks
- **Balanced** meals
- Monitor **portion** sizes

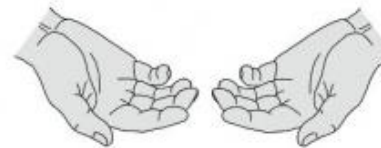


## Handy portion guide

Your hands can be very useful in estimating appropriate portions. When planning a meal, use the following portion sizes as a guide:



**FRUITS\*/GRAINS & STARCHES\*:**  
Choose an amount the size of your fist for each of Grains & Starches, and Fruit.



**VEGETABLES\*:**  
Choose as much as you can hold in both hands.



**MEAT & ALTERNATIVES\*:**  
Choose an amount up to the size of the palm of your hand and the thickness of your little finger.



**FATS\*:**  
Limit fat to an amount the size of the tip of your thumb.

**MILK & ALTERNATIVES\*:** Drink up to 250 mL (8 oz) of low-fat milk with a meal.

\* Food names taken from Beyond the Basics: Meal Planning for Healthy Eating, Diabetes Prevention and Management © Canadian Diabetes Association, 2005. Toronto General, Toronto Western, Princess Margaret, Toronto Rehab. Use this resource for more details on meal planning.

# Recommendations for Managing Nutrition Impact Features

- Adequate **fiber** from whole grains, fresh fruits and vegetables
- Choose **lean** proteins, e.g.,
  - Skinless chicken, lean and trimmed meats, fish
- Aim for vegetarian meals once a week
- **Limit** high fat, high simple sugar foods, e.g.,
  - Fast food, take-out, pizza, hot dogs
  - Donuts, cookies, ice cream
- **Watch beverages!**
  - **Avoid** pop, energy drinks, sweetened coffee drinks
  - Focus on **water**, skim or 1% or 2% milk

# Sugar and Cavities



- Dental problems are features of 22q11.2DS
- Sugar can cause cavities
- How to prevent cavities?
  - **Avoid sugary containing foods and liquids**
    - ✦ If having sugary foods, **eat with a meal** and brush your teeth right after
    - ✦ If unable to brush your teeth,
      - Have an **apple** or chew a piece of **sugar free gum** → saliva you make helps to wash off some of the sugar from your teeth
- Visit your **dentist** regularly

# Recommendations for Managing Nutrition Impact Features

## Additional strategies

- Focus on hunger cues, avoid mindless eating
- Model healthy behaviours
- **Positive** encouragement and reinforcement
- Avoid using food as a reward
- Keep “junk food” **out** of the house →
  - “Out of sight, out of mind”
- Put food on a **plate**, not have it sitting on the table
- Social classes or activities during hungry times





**THANK YOU**

**QUESTIONS?**

# Resources



- The Dalglish Family Hearts and Minds Clinic [www.22q.ca](http://www.22q.ca)
- Eat Right Ontario [www.eatrightontario.ca](http://www.eatrightontario.ca)
- The Heart and Stroke Foundation of Canada [www.heartandstrokefoundation.ca](http://www.heartandstrokefoundation.ca)
- Dietitian's of Canada [www.dietitians.ca](http://www.dietitians.ca)
- Canadian Obesity Network [www.obesitynetwork.ca](http://www.obesitynetwork.ca)
- Health Canada <http://www.hc-sc.gc.ca/index-eng.php>
- The Canadian Diabetes Association <http://www.diabetes.ca/>
- United States Department of Agriculture <http://www.choosemyplate.gov/>