# Practical Approaches to Adolescents with Obesity and Metabolic Syndrome

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## Learning objectives

By the end of this activity, participants will be able to:

- Refer to recent evidence in adolescent obesity and metabolic syndrome
- Assess an adolescent's weight status and any weight-related co-morbidities
- Initiate appropriate interventions for the management of adolescent obesity and metabolic syndrome



## Definition

- Abnormal or excessive amount of body fat accumulation that presents a risk to health
- Body mass index (BMI)
- In adults, standard adult BMI cut-points:
  - <18.5 underweight
  - 18.5 - 24.9 healthy weight
  - 25 - 30 overweight
  - >30 obese
- Cannot use these cut-points in childhood.
  - use BMI for age charts
  - >85th percentile = overweight
  - >95th percentile = obese

## Language and Weight status definitions

- Below a healthy weight: under 5th percentile
- Healthy weight: 5th to under 85th percentile
- Above a healthy weight: 85th percentile to under 95th percentile
- Well above a healthy weight: 95th percentile and above



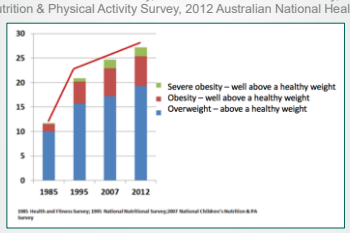
## NSW Premier's Priority

- Routine Advice and Clinical Service Delivery
- Education and Information
- Childhood Settings
- Food and Built Environment



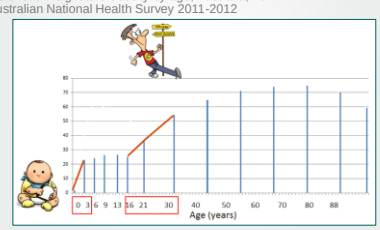
## Historical trend

Source: 1985 Health and Fitness Survey, 1995 National Nutritional Survey, 2007 National Children's Nutrition & Physical Activity Survey, 2012 Australian National Health Survey



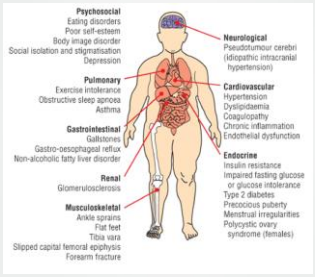
## Prevalence

Prevalence of overweight and obesity by age, Australia, 2011-12
Source: Australian National Health Survey 2011-2012






## Health harms






## Metabolic Syndrome in adolescents

**Key components:**

- **Adiposity – total or abdominal**
- **Dyslipidaemia**
- **Hypertension**
- **Insulin or impaired glucose tolerance**



## Metabolic Syndrome in adolescents

### Criteria variations

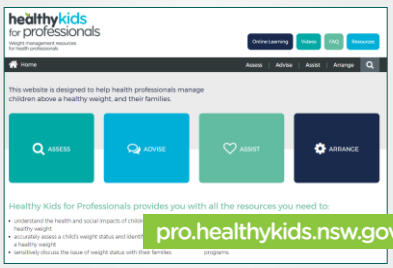
| | WHO Criteria | IDF Criteria (10-16yrs old) | NCEP ATP III Criteria |
|---|---|---|---|
| **Essential criteria** | **Insulin resistance (IR)** | | **Nil (3 of 5 below)** |
| **Glucose (mmol/l)**<br>**Insulin (pmol/l)** | **IR or Diabetes**<br>**IR** | **Fasting ≥ 5.6** | **Fasting ≥ 6.1**<br>**-** |
| **Triglycerides (mmol/l)** | **≥ 1.7** | **≥ 1.7** | **≥ 1.7** |
| **HDL-C (mmol/l)** | **< 0.91 Boys, 1.0 girls** | **< 1.03** | **< 1.0** |
| **Systolic BP (mmHg)** | **≥ 140** | **≥ 130** | **≥ 130** |
| **BMI (kg/m$^2$)** | **>30** | | **-** |
| **Waist circumference (cm)** | **Waist-to-hip ratio 0.9 (boys), >0.85 (girls)** | **≥ 90$^{th}$ Centile** | **Boys 102cm, Girls 88cm** |



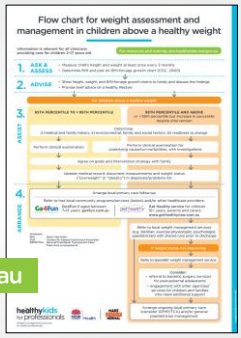
**WHO – World Health Organisation: IDF – International Diabetes Federation; NCEP ATP – National Cholesterol Education Program Adult Treatment Panel.**
**Refs: J. Pediatr. 2004; 145: 445–51: Int. J. Pediatr. Obes. 2008; 3: 3–8: Arch. Dis. Child. 2008; 93: 945–51. Table modified from JPCH 2016; 52: 928-934.**

## Adolescence – a changing, challenging time


## 4 A's approach



## 4 A's approach

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Weight management resources for health professionals

## Raising the issue

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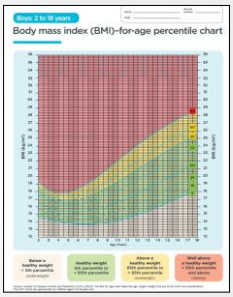
## Assess

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## Raising the issue

- Build rapport
- Use BMI chart
- Use sensitive language
- Avoid stigmatising
- Avoid blaming
- Be solution-focused and supportive
- ?another time to discuss further


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## Assessment - History

- **Medical history**
  - History of the weight problem
  - Evidence of complications on history (bullying, depression, joint problems, breathlessness, menstrual concerns …)
  - Level of concern and level of motivation for change
    - by family and young person
  - Family history
    - Weight problems/complications (eg diabetes)
    - High risk ethnic background?

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## Assessment - History

- Activity v's sedentary behaviour
- Diet history
- Psychosocial history
- Sleep issues


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## Factors specific to adolescents

- Late nights and inadequate sleep
- Skipping breakfast
- Irregular meals and snacks
- Avoiding eating at school
- Binge eating and/or drinking
- High volumes of screen time
- High calorie takeaway and fast foods
- Peer pressure
- Bullying/teasing – school avoidance

## Assessment – clinical examination

- BMI
- Waist circumference
- Blood pressure (use large cuff)
- Skin - acanthosis nigricans, striae, intertrigo, acne
- Tonsillar size
- Hepatomegaly (may be difficult to assess clinically)
- Gait and mobility (hip/knee/ankle joints, flat feet)
- Pubertal stage (Tanner stage - stage on chart )

## When to investigate?

- Age: adolescents > younger children
- Severe obesity (esp. central obesity)
- High risk family history:
  - 1st and 2nd degree relatives with heart disease, type 2 diabetes (incl. GDM), dyslipidaemia, sleep apnoea etc
- High risk ethnic group:
  - Indian sub-continent, Mediterranean & Middle-Eastern, Maori & Pacific Islander, Aboriginal & Torres Strait Islander, probably east Asian
- Clinical suggestion of co-morbidities

## What to investigate?

Initial fasting blood tests (others dependent upon results):

- Glucose
- LFTs (ALT, AST)
- Lipids (TG, HDL cholesterol, LDL cholesterol)
- Insulin
- ?TSH
- Iron studies
- Vit D and Vit B12
- Consider referral for sleep assessment
- Other investigations that MAY be warranted: OGTT, liver ultrasound

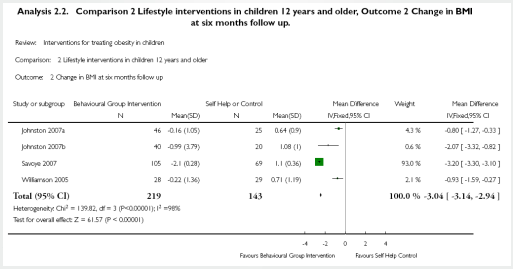
## What can we do?

The objective is to develop long-term healthy lifestyle habits for the young person and the whole family that not only help lose excess fat but maintain optimal weight and wellbeing.

## Treatment aims

- Long-term behavioural change:
  - Dietary change
  - Increase in physical activity
  - Decrease in sedentary behaviour
- Clarify treatment outcomes
  - Set SMARTER goals
- Young person decide – parents provide support
- Regular follow-up and support
- Importance of serial measurements
  - Monitoring and feedback
- Consider non-conventional therapies

## Lifestyle intervention versus self-help or control: children ≥12 years



**Analysis 2.2. Comparison 2 Lifestyle interventions in children 12 years and older, Outcome 2 Change in BMI at six months follow up.**

Review: Interventions for treating obesity in children

Comparison: 2 Lifestyle interventions in children 12 years and older

Outcome: 2 Change in BMI at six months follow up

| Study or subgroup | Behavioural Group Intervention N | Mean(SD) | Self Help or Control N | Mean(SD) | Mean Difference IV,Fixed,95% CI | Weight | Mean Difference IV,Fixed,95% CI |
|---|---|---|---|---|---|---|---|
| Johnston 2007a | 46 | -0.16 (1.05) | 25 | 0.64 (0.9) | | 4.3 % | -0.80 [ -1.27, -0.33 ] |
| Johnston 2007b | 40 | -0.99 (3.79) | 20 | 1.08 (1) | | 0.6 % | -2.07 [ -3.32, -0.82 ] |
| Savoye 2007 | 105 | -2.1 (0.28) | 69 | 1.1 (0.36) | | 93.0 % | -3.20 [ -3.30, -3.10 ] |
| Williamson 2005 | 28 | -0.22 (1.36) | 29 | 0.71 (1.19) | | 2.1 % | -0.93 [ -1.59, -0.27 ] |
| **Total (95% CI)** | **219** | | **143** | | | **100.0 %** | **-3.04 [ -3.14, -2.94 ]** |

Heterogeneity: Chi² = 139.82, df = 3 (P<0.00001); I² =98%

Test for overall effect: Z = 61.57 (P < 0.00001)

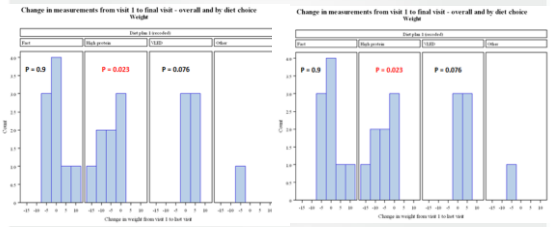
Favours Behavioural Group Intervention | Favours Self Help Control

**Oude Luttikhuis et al, 2009. Cochrane Review.**

## Additional effective interventions

- **Frequent contact**
  - **2 yr FU of >21000 in real life setting**
  - **More intense intervention better outcome**
  - **Reinehr et al. Obesity 2009**
- **SMS, email, phone call**
  - **Loozit study – community based intervention in obese adolescents**
  - **Nguyen et al Int J Obesity 2013**
- **Choice of dietary intervention**
  - **12 week dietitian-led weight management program with emphasis on lifestyle change**
  - **Preference for structured eating plans esp with portion sizing**
  - **Truby et al. JPCH 2011**

## Outcomes from an adolescent clinic dietary intervention program




## Interventions – what do adolescents think about weight management programs?

- **Enjoy participating with peers and meeting new people**
- **Liked: practical aspects – cooking and activity**
- **Disliked: writing down goals, repetition, time-consuming**
- **Enablers: goal setting**
- **Barriers: time constraints, lack of motivation**
- **Unrealistic expectations – problems with perceptions versus actual outcomes**
- **Coming to terms with the cyclical nature of behaviour change**
- **Main message – being active, healthy eating and reducing sedentary behaviour**

## How can we facilitate behaviour change/intrinsic motivation?

- **Motivation: Medical v's personal**

**STEALTH INTERVENTIONS**

- **Where physical activity/reduced inactivity or diet changes are "side effects" of the intervention**

- **Try to identify target behaviours that are motivating in themselves**
  - **Environmental Sustainability/Climate Change**
  - **Cause-Related Fundraising**
  - **Animal Protection**
  - **Food Safety**

- **Benefits of social interaction, sense of purpose and belonging, avoidance of personal failure, emotional involvement**

**Robinson: Obesity 2010**

## Drug therapy

### Adjuncts to lifestyle interventions

- **Obesity drugs (orlistat):**
  - **Cost of drug therapy (not on PBS)**
  - **Not licensed for use in adolescents**
  - **Only effective on the background of a lifestyle modification program**
  - **Role in treating moderate obesity in adolescence**
- **Other medications:**
  - **Metformin**
  - **Statins – Pravastatin**
  - **ACE inhibitors**
  - **?vit E, antioxidants, fish oil**

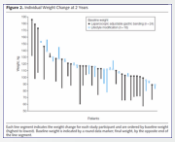
## Bariatric surgery

**Bariatric surgery:**

- Inclusion and exclusion criteria
- Major issues of cost and equity of access
- Adolescents – RCT outcomes positive

(O'Brien P et al, JAMA 2010; 303: 519-526)

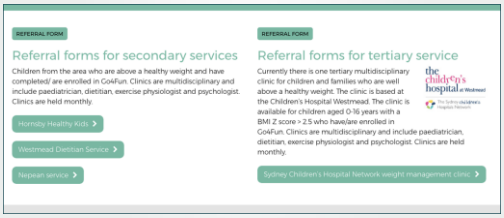
- Specialised centres



**Refer on for complex, severe cases**



## Arrange






## Community programs: Go4Fun

- Free community-based child obesity treatment program.
- Once a week, two hours per session, delivered over the school terms.
- Multi component:
  - A dietary component
  - A structured exercise or physical activity component
  - A behavioural component and
  - Family (parental) involvement



## Go4Fun

- Program Eligibility:
  - Resides in NSW
  - Aged 7 to 13 years above a healthy weight
  - Parent/carer available to attend each session
- Programme outcomes:
  - BMI: -0.5 kg/m2
  - Waist circumference: -1.3 cm
  - Physical activity: +3.6 hours per week
  - Sedentary behaviours: -3.1 hours per week
  - Self esteem: statistically significant improvements
  - Fruit and vegetable intake: statistically significant improvements



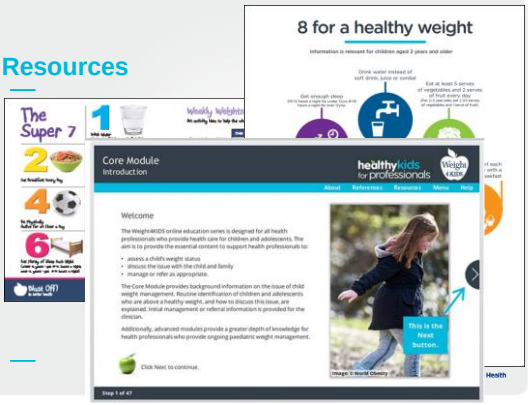

## Get Healthy Service

The Get Healthy Information and Coaching Service is a free, confidential information and telephone coaching program.

- Participants aged 16 and over receive 10 individually tailored, evidence based health coaching calls over a six month period
- Participants reported the following results:
  - An average of 3.8 kg reduction in weight
  - An average of 4.9 cm reduction in waist circumference
- NSW Health is commencing a trial for a telephone advice service for parents of 2-6 year olds
- Get Healthy in Pregnancy (NSW)

get healthy
Information & Coaching Service
1300 806 258
Monday - Friday 8am - 8pm

## Resources



## Practical tips when interacting with adolescents

- **Don't:**
  - Label, lecture, or have power struggles
  - Act like a parent or teacher
  - Endorse unsafe behaviours
  - Make assumptions/pretend to understand what they mean
  - Rely on information from another source – check with the young person directly
  - Try to be cool

## Practical advice - diet

- Regular meals especially breakfast
- Eat together as a family
- No eating in front of screens
- Healthy choices for after school snacking
  - Store healthy snacks
- Review portion size
- Discuss take away choices
- Input into meal preparation
- Water as the main drink
- Don't eat late
- Use smaller plates
- Slow down eating

## Practical advice – physical activities

- Increase incidental activity in particular
  - 1 to 2 hours of planned sport a week will not counteract a sedentary lifestyle
  - Pedometer or equivalent – 10,000 steps/day
- Find opportunities to be active with their peers
  - eg youth groups
- Help with household tasks!!
- Active transport – walk when you can
- Parents to model activity
- Family activities
- Support activity that is fun

## Practical advice – screen time

- TV/screens out of bedrooms
- Monitor
- Encourage rules around "screens"
- Switch off screens for eating
- Plan what you want to watch
- Remote control out of reach
- Alternatives to watching TV
- Plan a "switch off" day
- Holiday planning

## Practical advice – sleep

- Aim for 8-10 hours
- Develop a routine
- Bed before midnight!
- Screens off 30 min prior
- No TV in bedroom

## Take home messages

- Obesity prevalence continues to increase
- Metabolic syndrome prevalence variable
- Raising the issue can be difficult
  - Use BMI charts, sensitivity
- Assessment can be quick covering a few basic areas
- Small steps at a time can be implemented
  - SMARTER goals help structure interventions
- Adolescent engagement with parental support is essential
- Use Stealth Interventions to increase motivation
- Refer when obesity more severe and/or complex cases
- Changing lifestyle habits is worthwhile


-PERSISTENCE-
there is no GIANT step that does it.
It's a lot of LITTLE steps.