Chronic Management of Asthma in Children

Asthma and Wheeze in Children

Pharmac Workshop 2015

Preventive management in asthma

- Goals of asthma therapy
  - Maximize quality of life (reduce symptoms)
  - Reduce risk
  - Avoid adverse treatment effects
  - Utilising a step-wise approach to management

Chronic Care for Asthma

- *Aim is to give patients the best possible life free of limitation by their asthma*

- Assessment and monitoring
- Taking medications appropriately
- Active self-management
- Reducing environmental triggers.

NIH 2007

Results of doing the basics well

- Bracken, Bush et al. Arch Dis Child 2009
  - 71 children problematic asthma
- Nurse-led home visit
  - Ongoing allergens 31%
  - Passive or active smoking 25%
  - Medication issues incl adherence 48%
  - Psychosocial factors 59%
- Only 45% needed further assessment

Assessment: Control vs Severity

Levels of Asthma Control (GINA 2006)

Characteristic	Controlled (All of the following)	Partially Controlled (Any measure present in any week)	Uncontrolled
Daytime symptoms	2x/week or less	>2x week	≥3 features of partly controlled asthma present in any week
Limitations of activities	None	Any	
Nocturnal symptoms/ awakenings	None	Any	
Need for reliever/ rescue treatment	2x/week or less	>2x week	
Lung function (PEF or FEV_1)*	Normal	>80% predicted or personal best (if known)	
Exacerbations	None	≥1x year**	1 in any week†

Assessment and monitoring

- The aim is no impairment (Normality)
- This requires regular and ongoing review
  - Review of symptom control (ACT)
  - Objective measuring
  - Review of exacerbations
  - Review of adherence & technique

Have your child complete these questions.

1. How is your asthma today?

 0 Very bad	 1 Bad	 2 Good	 3 Very good

SCORE ☐

2. How much of a problem is your asthma when you run, exercise or play sports?

 0 It's a big problem, I can't do what I want to do.	 1 It's a problem and I don't like it.	 2 It's a little problem but it's okay.	 3 It's not a problem.

☐

3. Do you cough because of your asthma?

 0 Yes, all of the time.	 1 Yes, most of the time.	 2 Yes, some of the time.	 3 No, none of the time.

☐

4. Do you wake up during the night because of your asthma?

 0 Yes, all of the time.	 1 Yes, most of the time.	 2 Yes, some of the time.	 3 No, none of the time.

☐

Please complete the following questions on your own.

5. During the last 4 weeks, how many days did your child have any daytime asthma symptoms?

5 Not at all	4 1-3 days	3 4-10 days	2 11-18 days	1 19-24 days	0 Everyday

☐

6. During the last 4 weeks, how many days did your child wheeze during the day because of asthma?

5 Not at all	4 1-3 days	3 4-10 days	2 11-18 days	1 19-24 days	0 Everyday

☐

7. During the last 4 weeks, how many days did your child wake up during the night because of asthma?

5 Not at all	4 1-3 days	3 4-10 days	2 11-18 days	1 19-24 days	0 Everyday

☐

TOTAL

Asthma medications

- Relievers
- Preventers/Controllers

Step-wise approach to management

Step 1:	SABA alone (short-acting beta agonist)
Step 2:	A: Add ICS at low dose (inhaled corticosteroid)
	B: Increase ICS to moderate dose
Step 3:	Add LABA (long-acting beta agonist)
Step 4:	High dose ICS+LABA and/or add oral medication - consider referral to paediatrician
Step 5:	Frequent or continuous oral steroids - definite referral to paediatrician

BPAC. Feb 2012

Relievers

- Short-term bronchodilators
- Beta-agonists – salbutamol/terbutaline
- Anti-cholinergics – ipratropium (atrovent)
- Theophylline
- IV magnesium sulfate

Relievers (2/2)

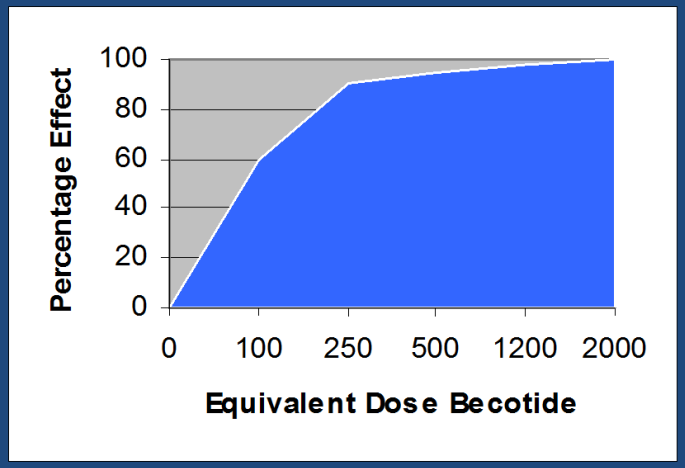
- Short onset and offset of action
- Spacers better than nebulisers
  - Also available IV
- Adverse effects
  - Tachycardia
  - Jitteriness
  - Seizures
  - Theophylline the worst

Preventers

- Mast cell stabilisers (Intal)
- Inhaled corticosteroids (ICS)
- Long-acting beta-agonists (LABAs)
- Anti-leukotriene montelukast (Singulair)

Inhaled corticosteroids (ICS)

- Suppress inflammation
- Long-term effect
  - Reduced regular symptoms
  - Reduced exacerbations (less than in adults)
- Most of benefit is at low to medium dose



ICS (2/3)

- Poor inhalation technique results in adverse effects with no benefit
- Adverse effects
  - Oral or pharyngeal thrush
  - Hoarse voice, cough
  - Growth suppression
  - HPA axis suppression (> 400 mcg /day)
  - Osteopenia
  - Skin thinning

ICS (3/3): Approx Dose equivalency

- Standard strength
  - Old beclomethasone (becotide)
  - Budesonide
- Double Strength
  - Fluticasone Proprionate (flixotide)
  - New ultrafine beclomethasone (QVAR)
  - Ciclesonide
- Quadruple strength
  - New once daily Fluticasone Fuorate

LABAs

- Salmeterol (Serevent or Seretide)
- Efomoterol (Symbicort)
- Indacaterol and other once daily (Breo)
- Class effect
  - Increased severe asthma exacerbations and death
  - Do not prescribe in < 4 years
- Single inhaler therapy (“SMART”)
  - > 12 years
- Future and other treatments
  - LAMAs not yet licensed/funded
  - Omalizumab

What inhaler is appropriate

- Spacer with mask – infants or young

- Spacer no mask - when able (4 y)
  - Improved lung deposition by 60%
  - Not when severe exacerbation

What inhaler is appropriate (2/2)

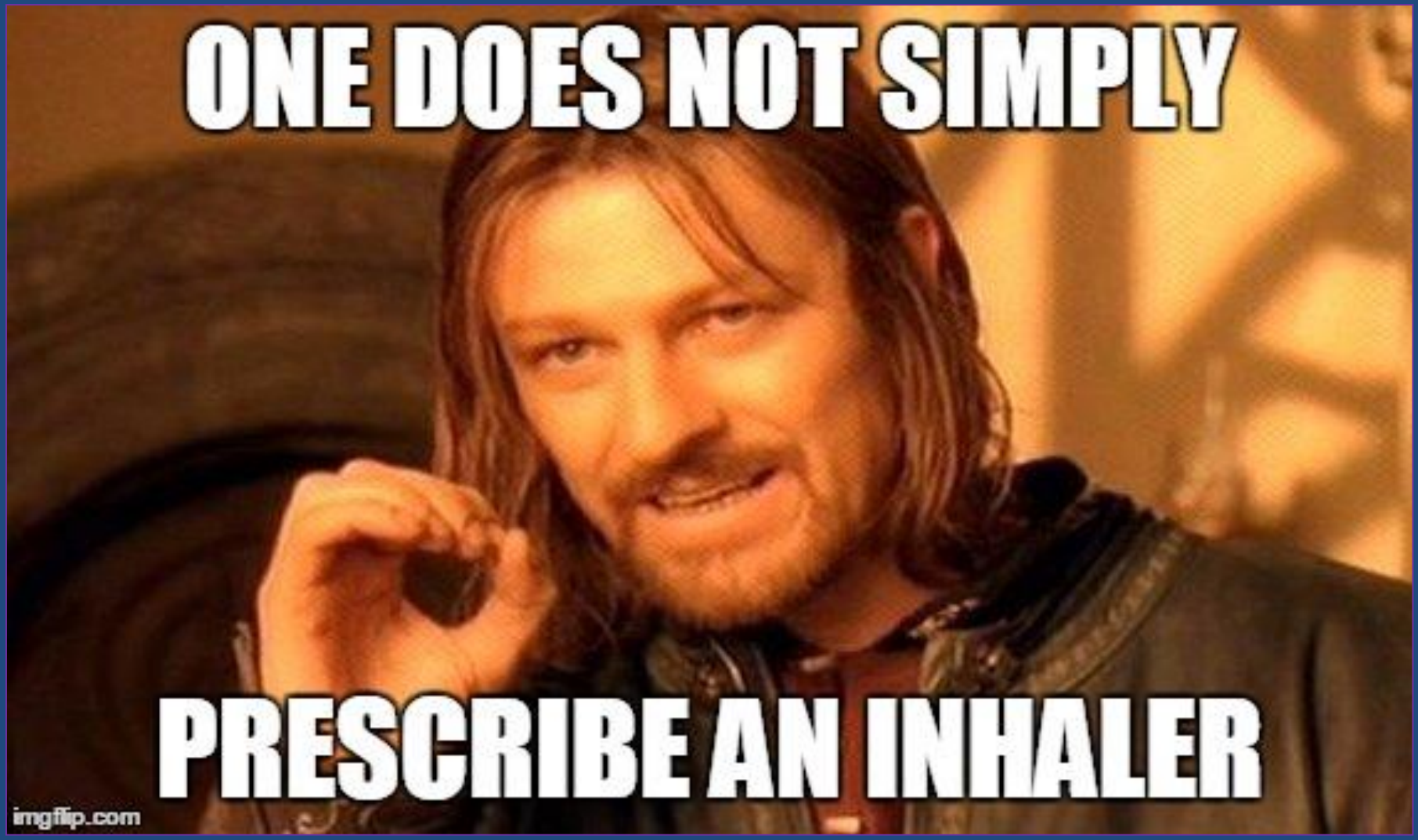
- Turbuhaler - from 7 years at earliest

- MDI alone - never

NZ children

- Only 80% of children under 6 use a spacer
- Only 30% of children over 7 use a spacer
- Less than 35% given an action plan

Crengle NZMJ 2011
Crengle Thesis 2008


ONE DOES NOT SIMPLY
PRESCRIBE AN INHALER
imgflip.com

Practice points

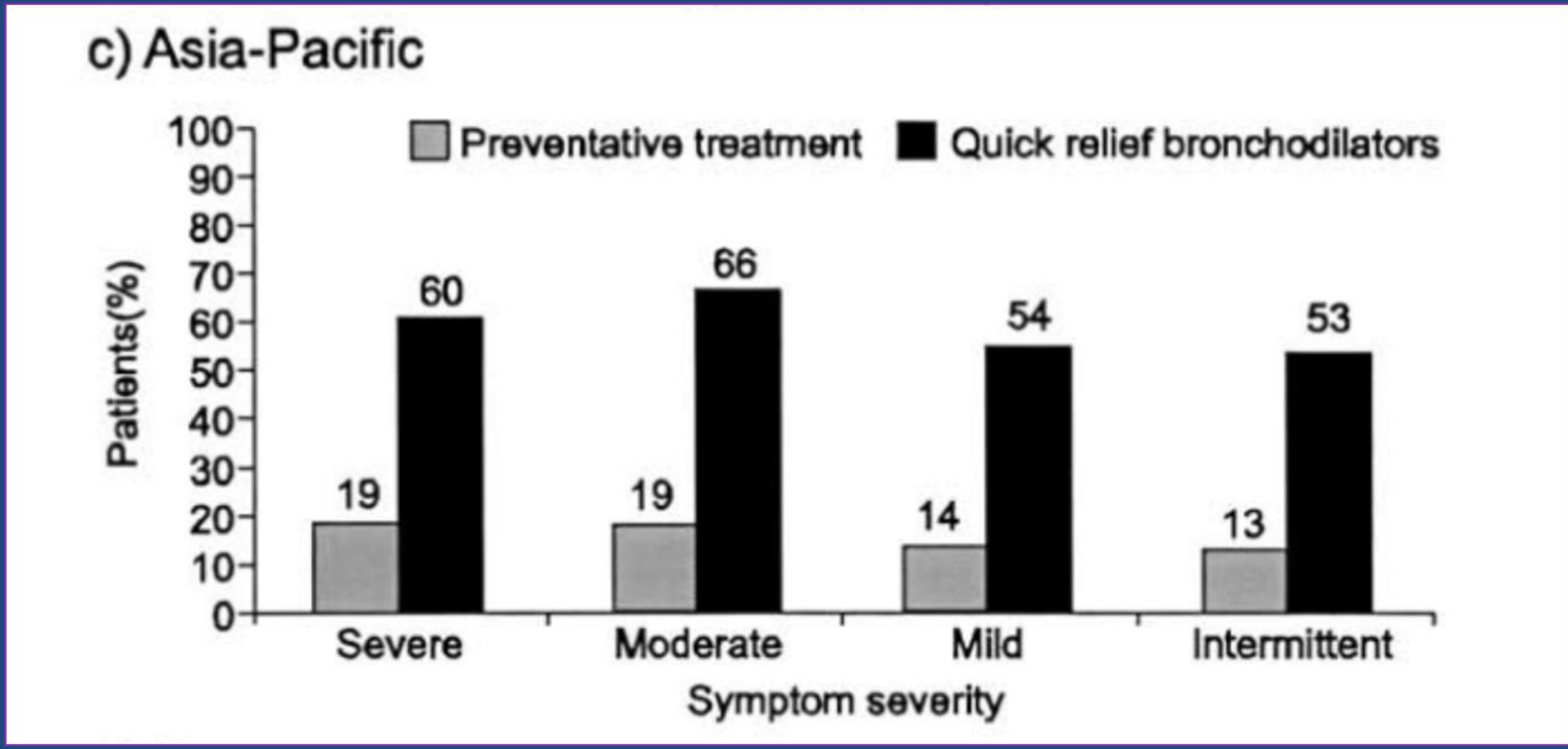
- Treatment should be started at the lowest step consistent with frequency of symptoms
  - Step 1 or 2
- Assessment of severity will change with treatment
- Reassess after 2-3 months & step up or down
- Titrate to the lowest step that controls symptoms

Reality (worldwide data)

- Only 30 - 50% of asthma patients are well controlled (adults and children)
- Compliance with ICS preventers only 20-30%
- 34% of patients with uncontrolled asthma use a preventer less than once per week

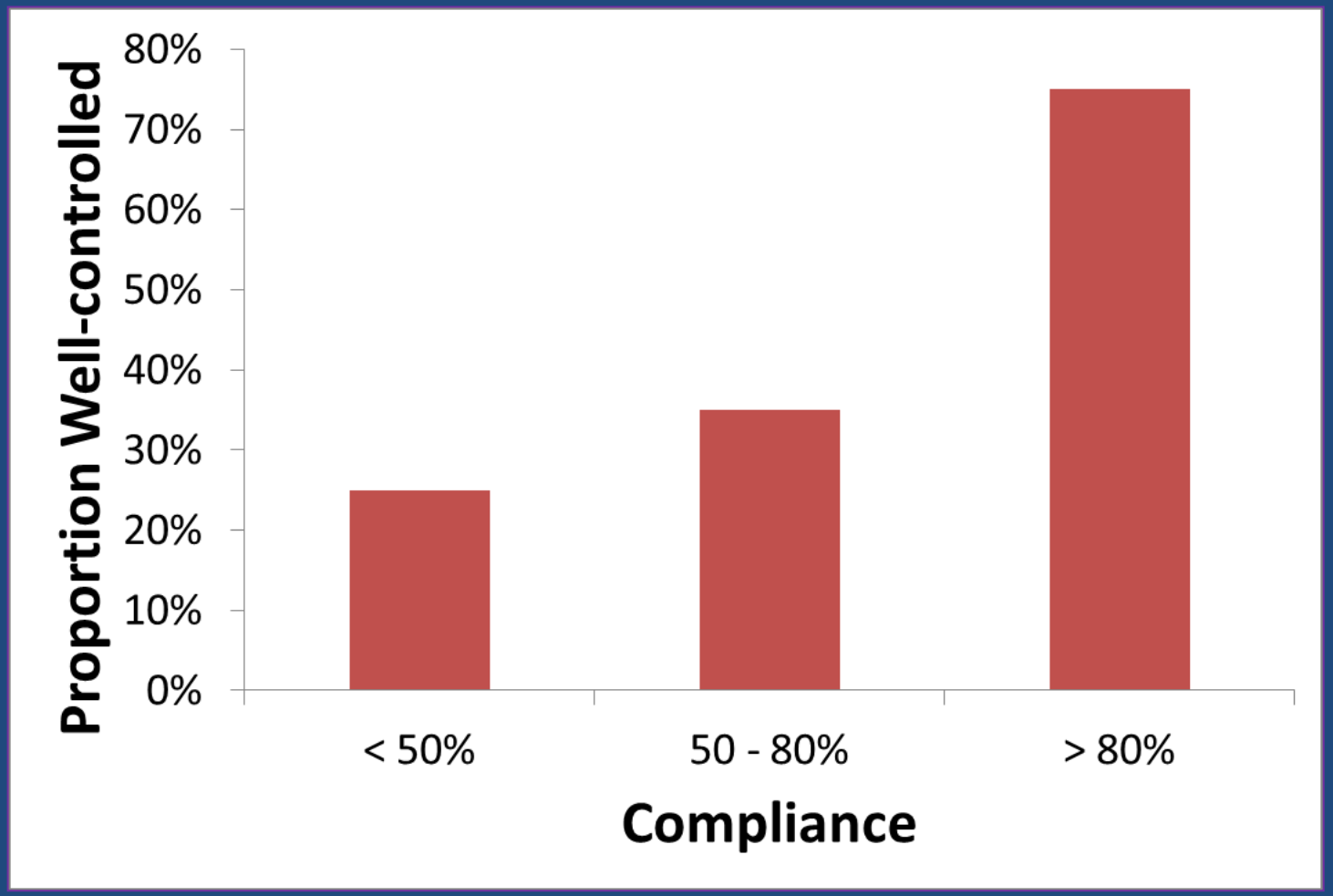
Rabe JACI 2004
Reddell MJA 2015

Low levels of preventer therapy use across all severities



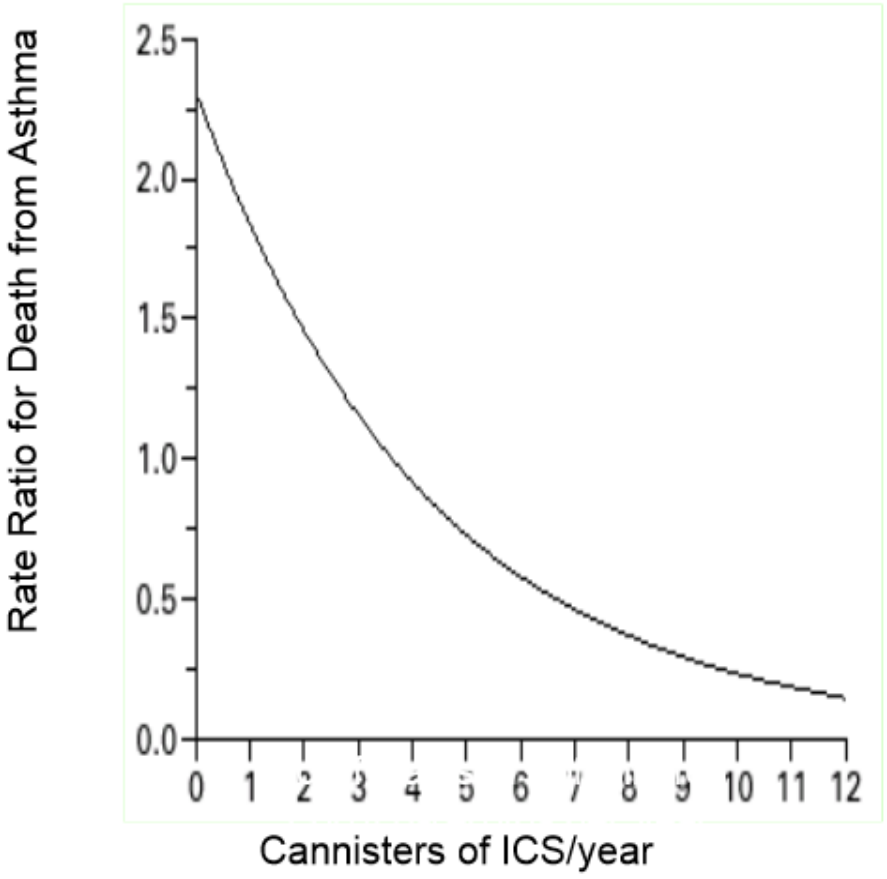
Rabe JACI 2004

Importance of adherence

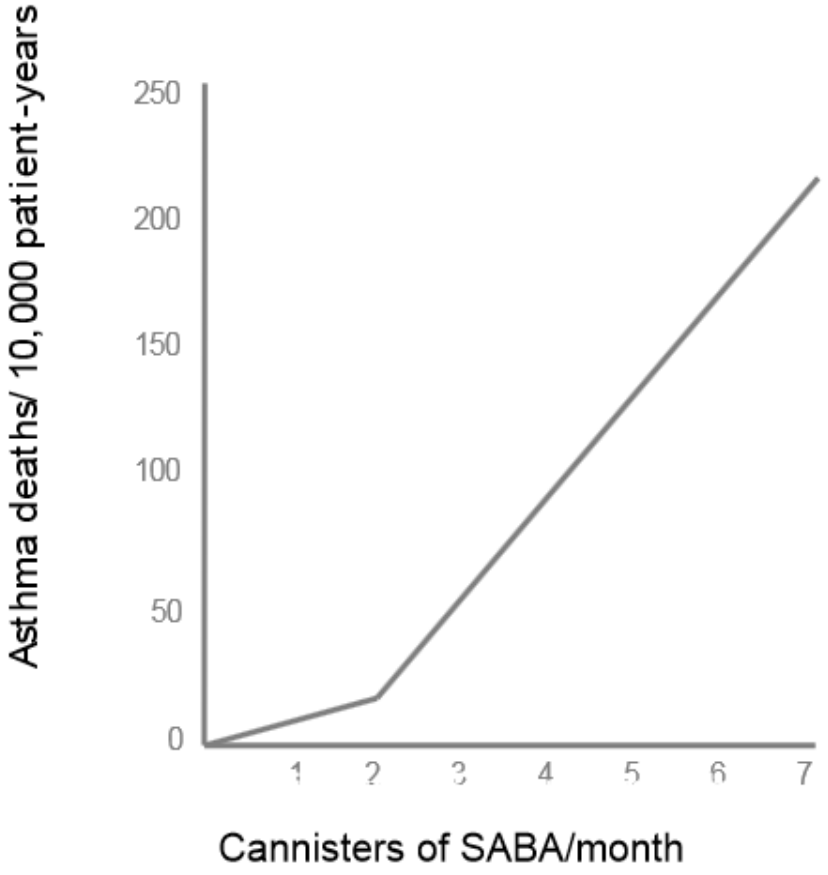


Klok, ERJ, 2014

ICS reduce risk of death but excess SABA associated with increased risk



Suissa S et al. NEJM 2000;343:332-6



Suissa S et al: AJRCCM 1994:149:604-10

Assessing adherence

- Prescribing records
  - At the Practice
  - Pharmacy database
- Self report – “How often do you forget to take your inhaler in a week?”
- Physician judgement
- Electronic monitoring devices

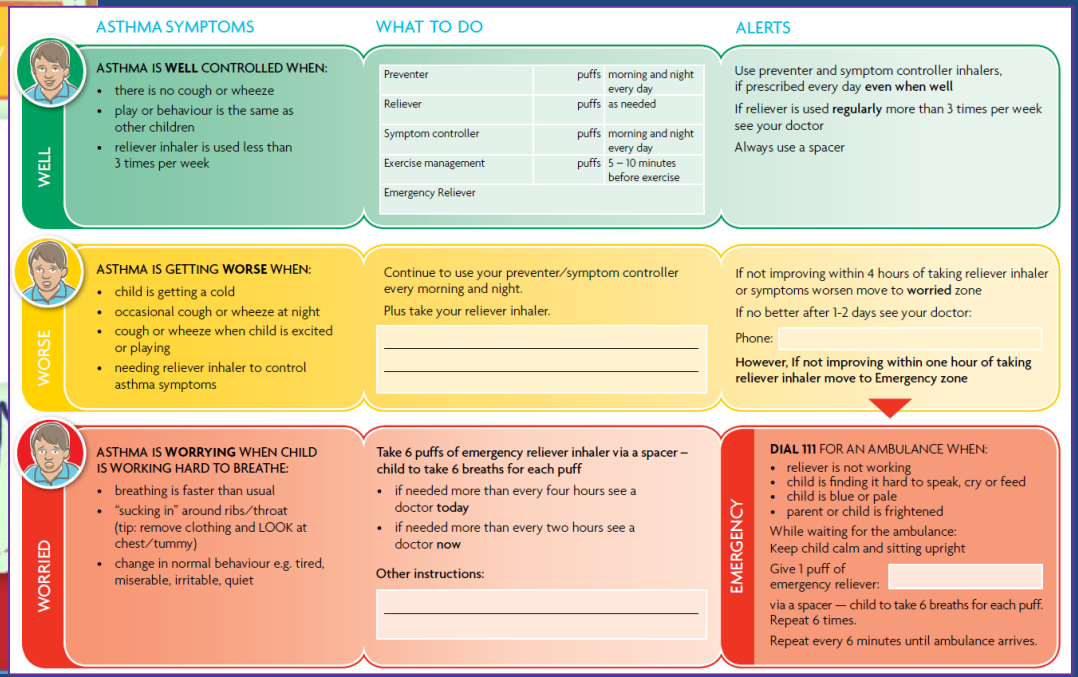
Action Plans

- Aim of Action plans is to
  caregivers to manage the
  when to seek help
  - In adults Grade A evid
    improve asthma outc
    admissions
  - In children educational
    asthma action plans pr

- THE MOST IMPORTANT SECTION IS ADVICE ON WHEN AND HOW TO SEEK HELP

www.pamp.org

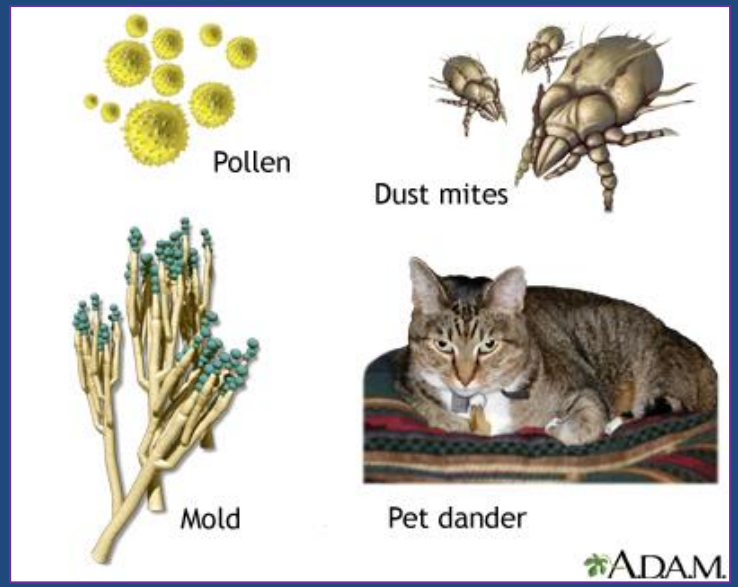
Asthma Foundation NZ



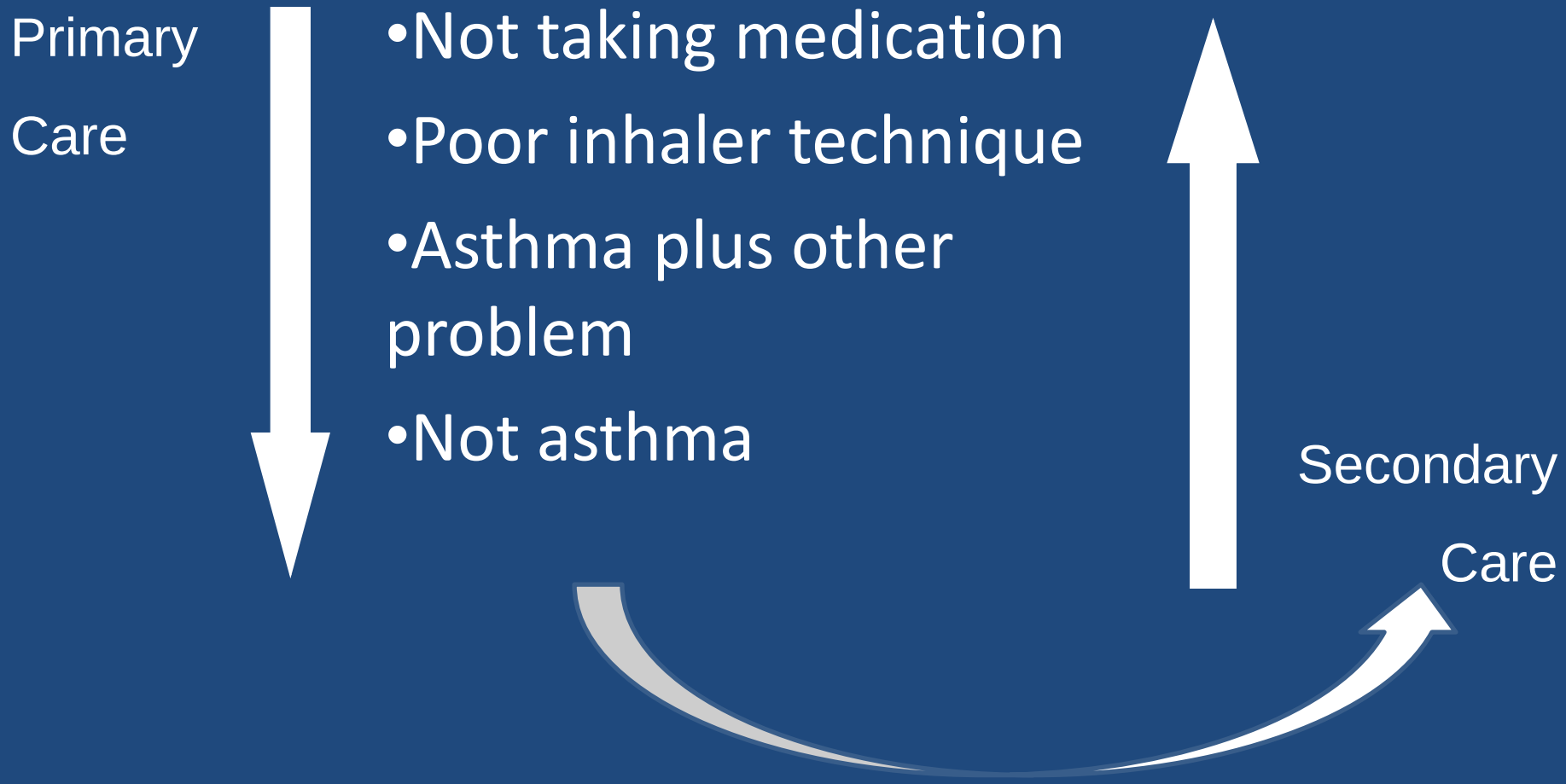
	ASTHMA SYMPTOMS	WHAT TO DO	ALERTS
WELL	ASTHMA IS **WELL** CONTROLLED WHEN: • there is no cough or wheeze • play or behaviour is the same as other children • reliever inhaler is used less than 3 times per week	Preventer — puffs — morning and night every day Reliever — puffs — as needed Symptom controller — puffs — morning and night every day Exercise management — puffs — 5 – 10 minutes before exercise Emergency Reliever	Use preventer and symptom controller inhalers, if prescribed every day **even when well** If reliever is used **regularly** more than 3 times per week see your doctor Always use a spacer
WORSE	ASTHMA IS GETTING **WORSE** WHEN: • child is getting a cold • occasional cough or wheeze at night • cough or wheeze when child is excited or playing • needing reliever inhaler to control asthma symptoms	Continue to use your preventer/symptom controller every morning and night. Plus take your reliever inhaler.	If not improving within 4 hours of taking reliever inhaler or symptoms worsen move to **worried** zone If no better after 1-2 days see your doctor: Phone: **However, if not improving within one hour of taking reliever inhaler move to Emergency zone**
WORRIED	ASTHMA IS **WORRYING** WHEN CHILD IS WORKING HARD TO BREATHE: • breathing is faster than usual • "sucking in" around ribs/throat (tip: remove clothing and LOOK at chest/tummy) • change in normal behaviour e.g. tired, miserable, irritable, quiet	Take 6 puffs of emergency reliever inhaler via a spacer – child to take 6 breaths for each puff • if needed more than every four hours see a doctor **today** • if needed more than every two hours see a doctor **now** **Other instructions:**	EMERGENCY **DIAL 111** FOR AN AMBULANCE WHEN: • reliever is not working • child is finding it hard to speak, cry or feed • child is blue or pale • parent or child is frightened While waiting for the ambulance: Keep child calm and sitting upright Give 1 puff of emergency reliever: via a spacer — child to take 6 breaths for each puff. Repeat 6 times. Repeat every 6 minutes until ambulance arrives.

Other Things to Consider

- Smoking cessation
- Allergen avoidance
- Associated conditions
  - Rhinitis
  - Reflux
  - OSA



Considerations in poor control



Discussion/Questions

Asthma as a chronic disease

Why Asthma Still Kills.
UK Review of asthma deaths 2014

- 195 deaths over a 12 month period
  - 9% mild asthma
  - 49% moderate
  - 39% had severe asthma

Why Asthma Still Kills (2/3)

- 43% of deaths no GP review last 12 months
- Quality of routine care inadequate in 62%
- Only 23% had action plans
- 45% died without seeking help

Why Asthma Still Kills (3/3)

- 10% died within 28 days of a hospital visit
- 39% more than monthly salbutamol prescriptions
- 30% fewer than 4 monthly ICS scripts per year
- 32% avoidable factors in management of final attack

Implications

- Asthma patients need ongoing follow up
  - GP recall systems
  - Mandatory follow up after hospital presentation
- A structured review of asthma at least annually
  - Include education and action plan

How to “do” Chronic Care

- Patients/families should be
  - Informed
  - Motivated
  - Prepared
  - Have access to treatment
- Requires extended and regular health care contact

WHO Innovative Care for Chronic Conditions, 2002

Barriers to self-management

- Lack of knowledge
- Poor perception of control
- Adherence to medication
- Cost of medication

Skills for self-management

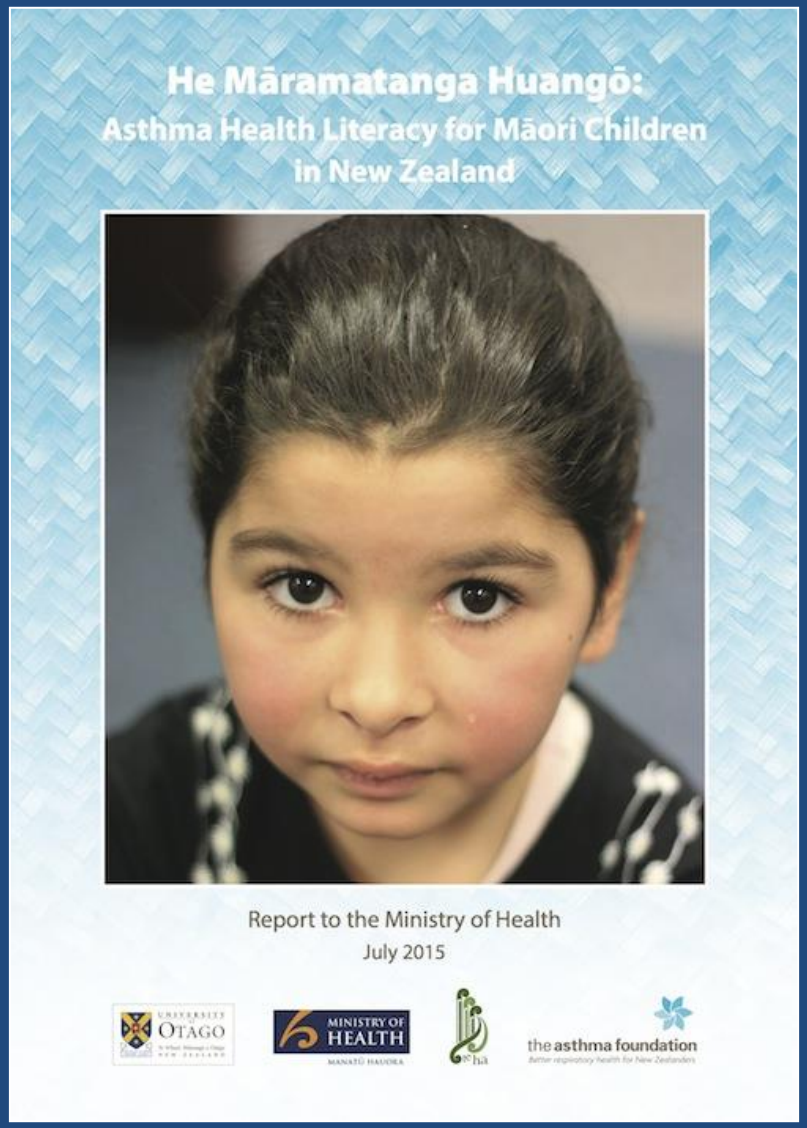
- Problem solving
- Decision making
- Resource utilization
- The patient-provider relationship
- Taking action

- Self-efficacy is an essential component of chronic care self-management

Tips for encouraging self-efficacy

- Small successes
  - Break down tasks into manageable chunks
- Social modelling
  - “I had another patient …”
- Positive coaching & motivational interviewing

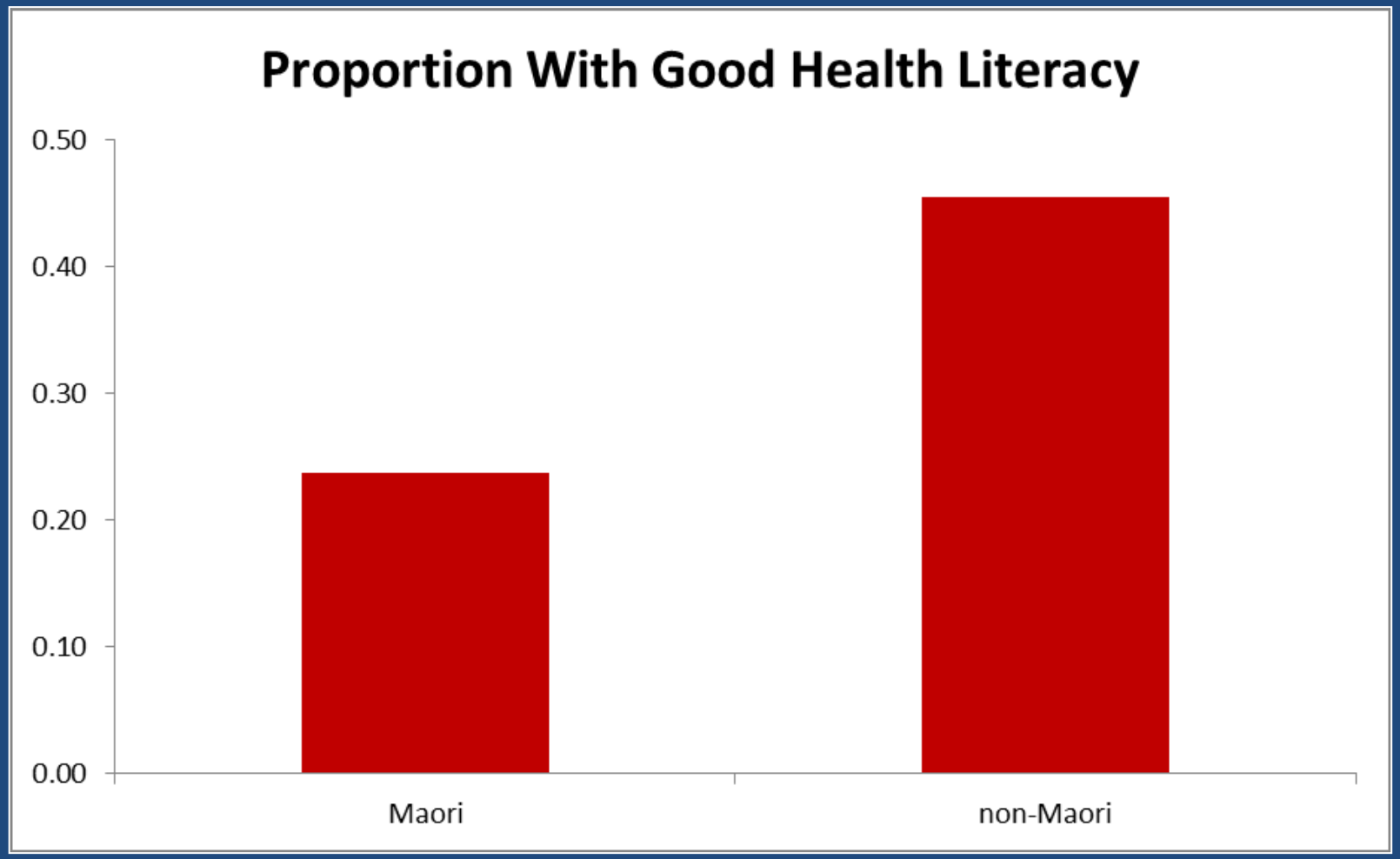
Asthma Health Literacy for Maori Children in NZ Report 2015



Whanau reported:

- Not having adequate knowledge
- < 50% understood what asthma is
- 1/3 not knowing how to seek urgent help
- Not being listened to
- Too much information at once
- Not being taught “why”

Health Literacy and Maori MOH 2010



“The responsibility for health literacy lies primarily with health professionals”

- Asthma Health Literacy For Maori Children Report 2015

What is good asthma education?

- Enhances health-literacy
- Enhances self-efficacy

A Strategy for Asthma Education in NZ

1. Mātauranga (Knowledge):

Delivering Understandable Best Practice Asthma Advice for Māori Children

2. Whakaakoako (Teaching Strategies):

Using Effective Strategies to Communicate About Asthma with Māori Children

3. Whakawhanake (Workforce Development):

Building Relationships and Working Together to Support Māori Children with Asthma

4. Te Anga (Model of Care):

Health Care Services That Meet the Health Needs of Māori..

Education takes time and repeated effort

- Deliver education in chunks (serial visits)
  - Education at all visits
  - Specific recommendations each visit
- Incorporate a variety of media
- Build rapport by building partnership
- Get training in health-literacy education

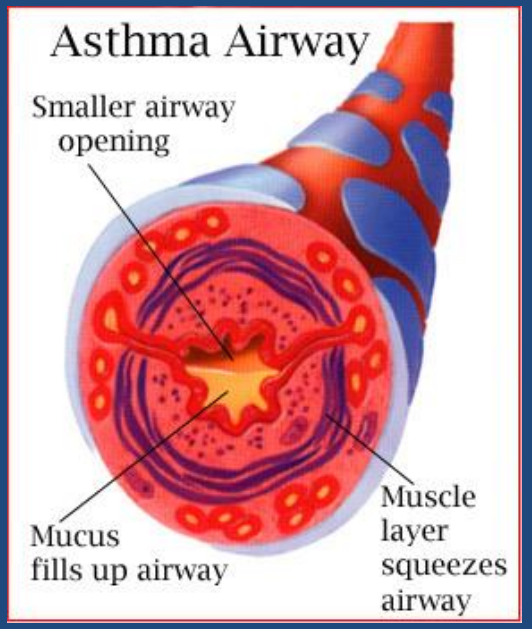
- Goal is improved self-management

Use a shared language for better understanding

- “Puffers”
- “Relievers and Preventers”
- “Flare ups”

Patient education

- The disease (pathophysiology)
- The treatment
  - Relievers
  - Preventers
- Inhaler device use



- Action plan
  - Recognizing worse symptoms
  - What to do

Chronic Care Model
Requirements for self-management

- Patient Care and Practice Improvement
- Organization
- Clinical information systems
- Delivery system design
- Decision support
- Self management
- Community resources

Summary: Children with asthma require regular review

- At EVERY review
  - Check symptom control
  - Check adherence
- At every review for asthma or ICS dose increase
  - Reconsider diagnosis
  - Check symptom control
  - Check inhaler technique & adherence
  - Preventive care – vaccination/smoke, check growth
  - Education (incl action plan)

Questions?

Cases

Case 1

- 10 year old boy
- Referred with daily cough
- Worse in cold air or with URTI, not at night
- No wheeze
- History of hayfever
- Family history atypical CF
- Spirometry mild obstructive patttern
  - FEV1/FVC 78%
- What next?

Case 1

- Trialled on Seretide
- Clinical improvement
- Normalised lung function

- Lessons Case 1
- With medium likelihood cases a trial of treatment with review is appropriate
- Caution with cough without wheeze

Case 2

- 15 year old girl
- Asthma since 5 years of age
- On seretide 2 puffs twice daily
- Recently 5 severe episodes asthma including 2 ambulance trips from school this year
- Triggers exercise and fumes
- Last trip had tingling of lips plus carpopedal spasm

- What do we want to know next?

Case 2

- Control
  - Wheeze 2-3x per week
  - Salbutamol 2-3x per week
  - No night waking
  - Unable to participate in sports
- Compliance
  - Taking one dose of seretide in evening, morning dose PRN
- Low normal lung function, borderline (8%) response to bronchodilator

Case 2

- Exam showed some signs of hyperventilation
- Taught “stop, drop and flop”

- Review
  - Action plan
  - Inhaler technique
  - Adherence – take inhaler regularly

- Lessons from Case 2?

Lessons Case 2

- Confusion about relievers and preventers common
- Functional disorders commonly co-exist in asthma
- Always review the basics

Case 3

- 12 year old girl
- Referred after 2 episodes respiratory arrest with asthma
  - One with URTI
  - One with fumes
  - Other triggers dust, cold air and exercise
- Salbutamol 1-3x per day (1 = pre-exercise)
- Monthly salbutamol inhaler
- Night waking 2x per week
- Decreased exercise capacity

Case 3 (exam)

- No clubbing
- Good growth
- No chest wall deformity
- Spirometry severe obstruction
  - FEV1/FVC 46%
- IgE 1300, +ve skin prick to HDM
- Currently on Seretide via spacer
  - Relatively compliant (inhaler every 2 months)
- What treatment next?

Case 3 Treatment

- Prolonged course of prednisone for control
- Changed Seretide to Vannair
- Add montelukast
- Reviewed action plan
  - ?too much salbutamol, reduced to 2 puffs
- Poor perception of symptoms - “focus” on symptoms
- Mouth – breathing: Treat hayfever
- Some improvement but still always poorly controlled when I see her
- Case 3 lessons?

Case 3 Lessons

- Excess salbutamol may be harmful
- High risks
  - Poor symptom perception
  - Obese
  - Frequent salbutamol prescriptions

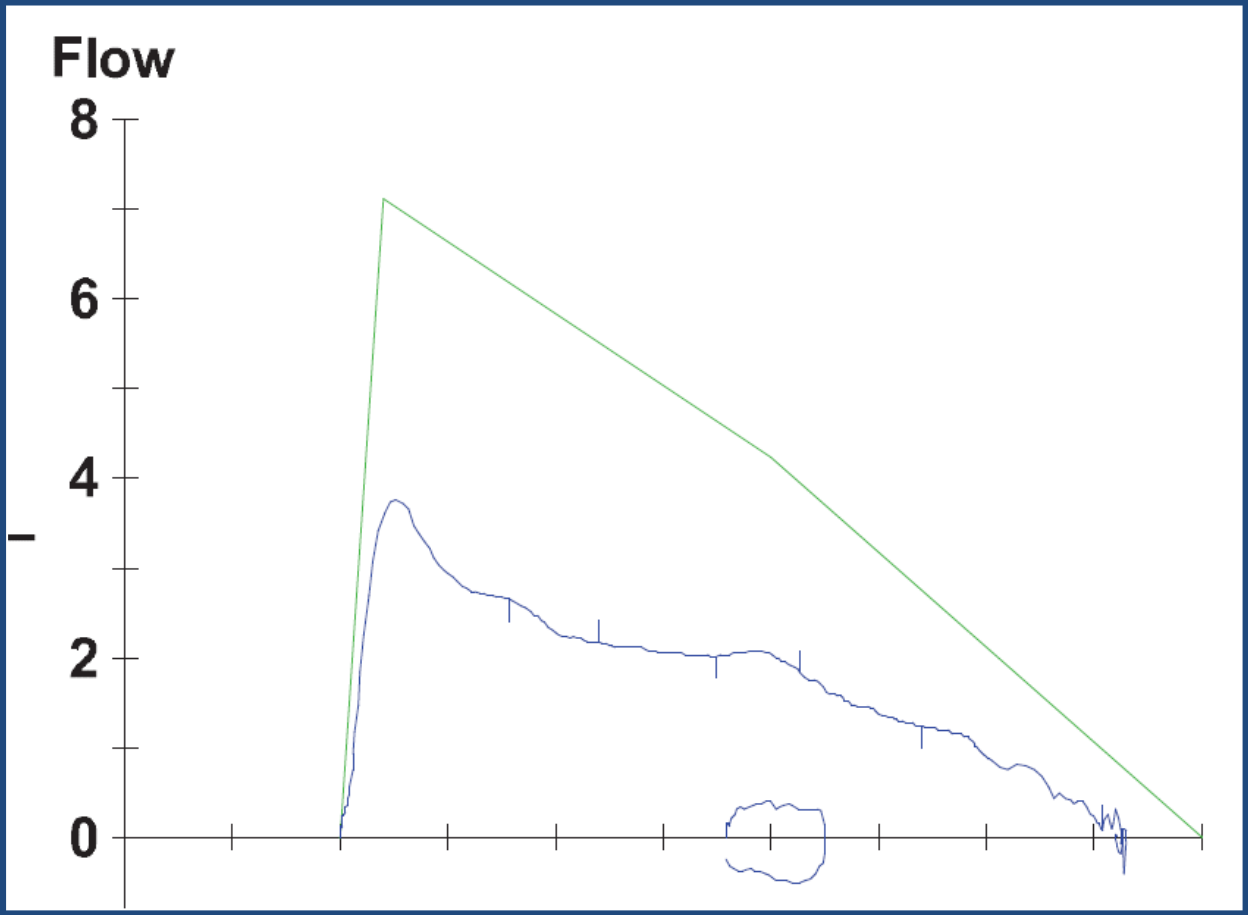
- A peak flow meter is useful for poor symptom perceivers

Case 4

- 14 year old girl,
- Diagnosed as asthma since 5 years
- On seretide 2 x 125/25 BD
- Asthma “attacks” with colds
- Has eczema
- Short of breath with sport (15 min)
- No relief from salbutamol
- Never admitted
- Very low peak flow 163 (pred 500)
- What next?

Objective testing

- FEV 63%, FEV1/FVC 61%

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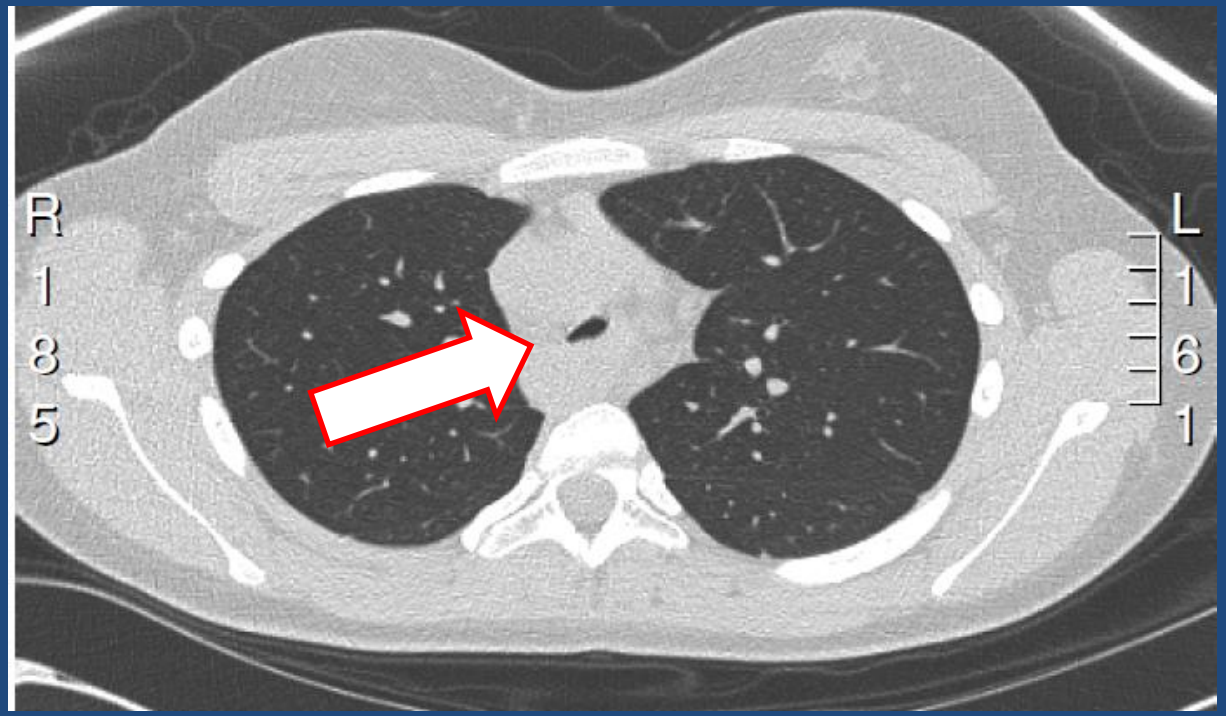
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Lesson from Case 4

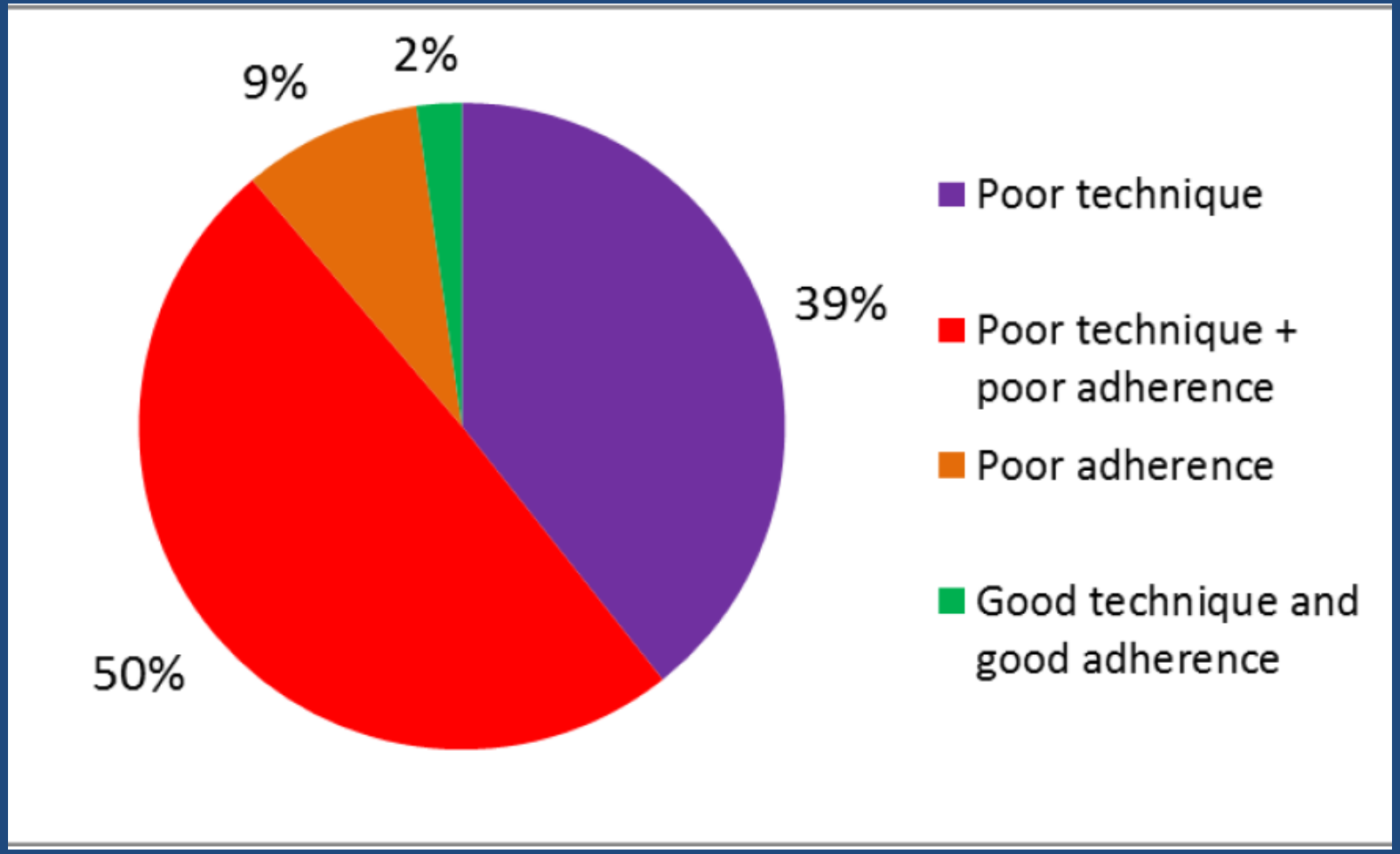
- All that wheezes is not asthma
- Review response to treatment in ALL patients
- Investigate if not responding

Discussion

Inhaler technique session

- https://www.youtube.com/watch?v=7X4CoXIdlCA

Asthmatics with poor control



Armour et al, J Asthma 2011

Common errors (many bizarre techniques!)

- All inhalers
  - Not breathing out first, away from inhaler
  - Not holding breath afterwards
- pMDI
  - Delay between actuation and inhalation
  - Fast inhalation
  - Two actuations during single inhalation

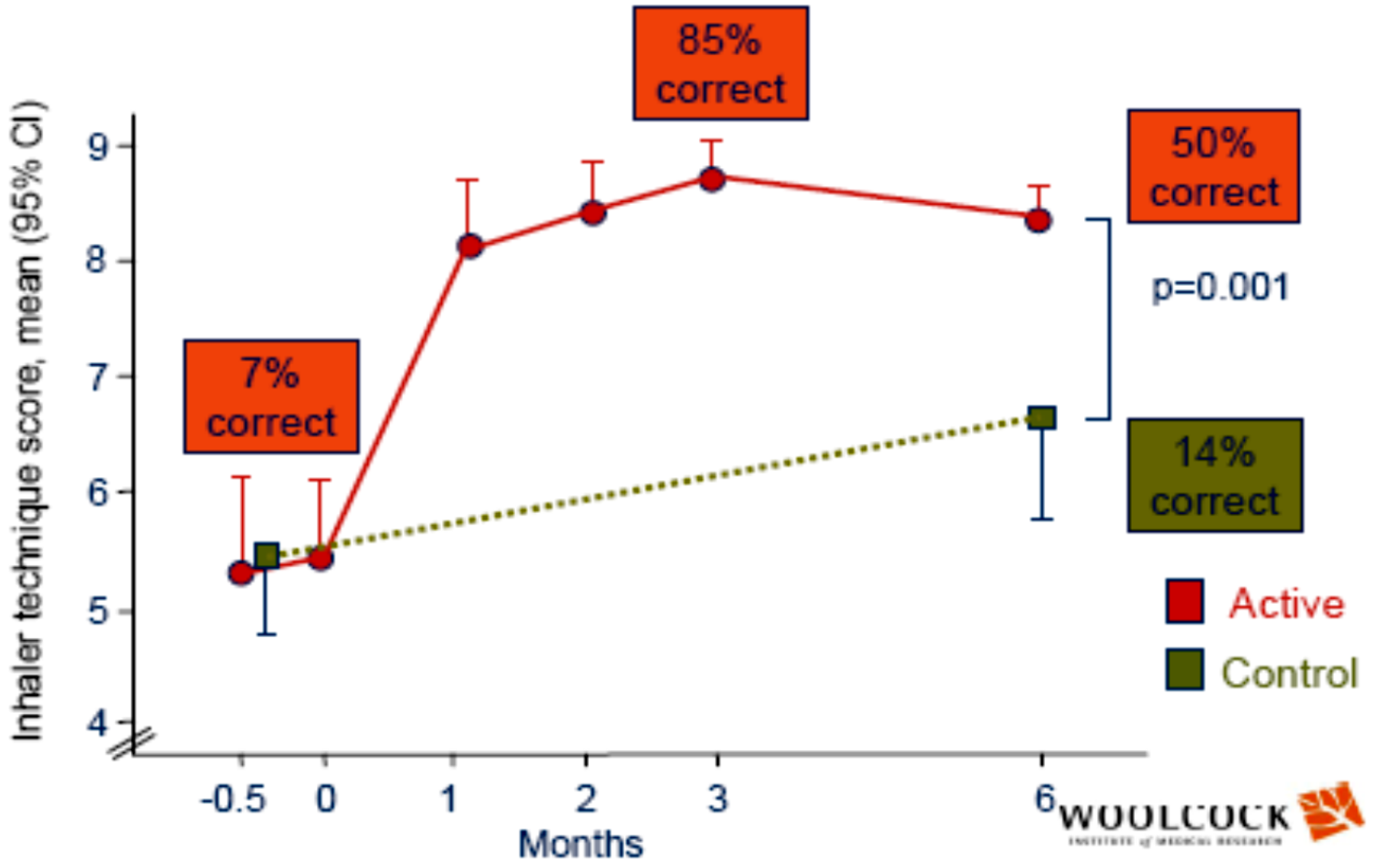
Common Errors (2)

- Turbuhaler
  - Failing to hold Turbuhaler upright during priming
  - Only doing half of the priming manoeuvre
  - Covering air intake holes with mouth

Why poor technique?

- Only 7 - 22% have had technique tested
- 20 - 50% of health professionals incorrect technique!
  - up to 85% for dry powder inhalers
- Repeated education necessary
  - Dry powder inhalers take 3 sessions
- Skills may decay over 2-6 weeks and certainly by 3 months

Turbuhaler technique score



Basheti et al Pat Educ Counsel 2008

Basheti et al, Am J Pharm Educ 2009

Solution

- Ensure your own technique correct
  - Workshops
  - Websites - videos
- Get patient to DEMONSTRATE technique at initiation
  - Checklist
  - Educate about errors
  - Label inhaler
  - Check technique every 3 months (script)

Inhaler Workshop: check lists

MDI alone

1. Remove cap
2. Check dose counter (if applicable)
3. Hold inhaler upright and shake well
4. Breathe out gently, away from the inhaler
5. Put mouthpiece between teeth without biting and close lips to form good seal
6. Start to breathe in slowly through mouth and, at the same time, press down firmly on canister
7. Continue to breathe in slowly and deeply
8. Hold breath for about 5 seconds or as long as comfortable
9. While holding breath, remove inhaler from mouth
10. Breathe out gently, away from the inhaler
11. If an extra dose is needed, repeat steps 2 to 10
12. Replace cap

MDI + Spacer

1. Assemble spacer* (if necessary)
2. Remove inhaler cap
3. Check dose counter (if applicable)
4. Hold inhaler upright and shake well
5. Insert inhaler upright into spacer
6. Put mouthpiece between teeth without biting and close lips to form good seal
7. Breathe out gently, into the spacer
8. Hold spacer level and press down firmly on inhaler canister once
9. Breathe in and out normally for 3 or 4 breaths
10. Remove spacer from mouth
11. Breathe out gently
12. Remove inhaler from spacer
13. If an extra dose is needed, repeat steps 3 to 12
14. Replace cap and disassemble spacer

Turbohaler

1. Unscrew and remove cover
2. Check dose counter
3. Keep inhaler upright while twisting grip
4. Twist around and then back until click is heard
5. Breathe out gently, away from the inhaler.
6. Place mouthpiece between teeth without biting and close lips to form a good seal. Do not cover the air vents
7. Breathe in strongly and deeply
8. Hold breath for about 5 seconds or as long as comfortable
9. Remove inhaler from mouth
10. Breathe out gently away from the inhaler
11. If an extra dose is needed, repeat steps 2 to 10
12. Replace cover

Accuhaler

1. Check dose counter
2. Open cover using thumb grip
3. Holding horizontally, load dose by sliding lever until it clicks
4. Breathe out gently, away from the inhaler
5. Place mouthpiece in mouth and close lips to form a good seal, keep inhaler horizontal
6. Breathe in steadily and deeply
7. Hold breath for about 5 seconds or as long as comfortable
8. While holding breath, remove inhaler from mouth
9. Breathe out gently, away from the inhaler
10. If an extra dose is prescribed (not generally recommended), repeat steps 3 to 9
11. Close cover to click shut

Cleaning MDIs and spacers

MDI care

- Should be stored upright (evaporation)
- Should be “discharged” if not used for a long time (> 1 week)
- Should be disassembled and rinsed weekly *then left to dry*
- Without a counter no reliable way to tell when used up
- Write the date of first use down then dispose of 28 days later or approx used up date

Spacer care

- Wash monthly
- Warm water & dish washing liquid (static)
- Drip dry
- Replace 6 monthly