

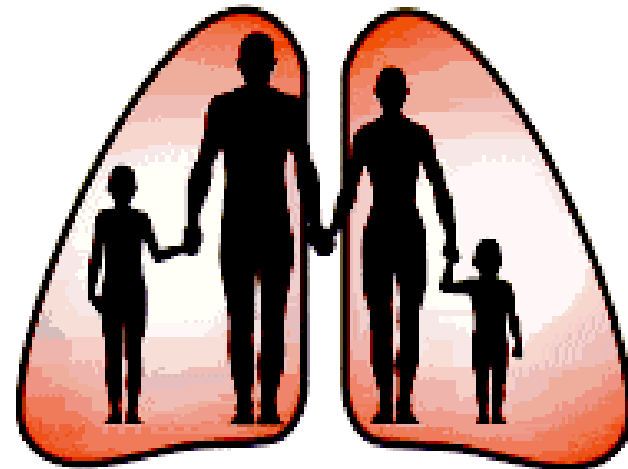
FAMILY PHYSICIAN AIRWAYS
GROUP OF CANADA
www.fpagc.com

Asthma in the ER

Education and Management

CSRT, May 2009

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Chairperson
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FPAGC

Family Physician Asthma Group of Canada



FPAGC

Family Physician Asthma Group of Canada

You are all invited!!!

2010 Making Every Breath Count

The Westin Harbour
Castle Hotel
1 Harbour Square,
Toronto, Canada

The International
Primary Care
Respiratory Group is
pleased to announce
that the 5th World
Conference will
be held in Toronto,
Canada.



FOR INFORMATION

Conference Secretariat:
The Office of Continuing
Education and Professional
Development, Faculty
of Medicine, University
of Toronto
Phone: 416.978.2719
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www.theipcr.org

The International Primary
Care Respiratory Group
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(Company number
254288).



Situated on the North shore of the Great Lakes, Toronto offers the sophistication of a large, modern city mixed with the world cultures of our citizens and the beauty of our natural surroundings. Toronto awaits and welcomes you!

Education in ER

- How we assess severity
- How we treat
- How we discharge
- How we instruct on discharge

Education

Asthma in the ER

- Fleuelling Coroner's Inquiry Case, November 2000

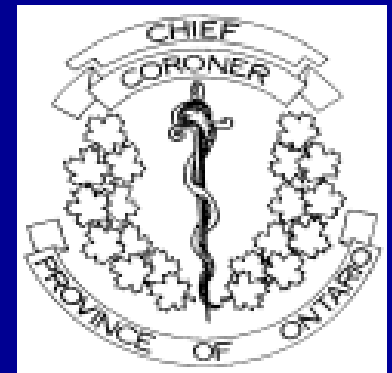
Tragedy

Joshua Fleuelling

- January 1999, 18 year old male died due to an acute asthma exacerbation

Coroner's Inquest

- 46 recommendations
- Focused on 3 areas:
 - Asthma Treatment and Management
 - Emergency Services and Response
 - Emergency Room Overcrowding and the Health System



Coroner's Recommendations

- Physicians should advise all asthma patients that untreated, or improperly managed asthma **can be life threatening**.
- Physicians should be trained to **recognize** the increased risk of death in asthma patients who have presented to hospital Emergency Departments for breathing problems, or have been hospitalized due to a poorly controlled disease. Long-term asthma management requires patient education, knowledge of environmental control and irritants, and the proper usage of medications.

What we did

- Ministry of Health with the OHA and the OLA partnered to create a standardized ER Action Chart on Asthma (with FPAGC and CAEP)
- Trialed at 6 hospitals, reviewed by Queens people with other talks at ASED
- Step by step from triage through severity, investigations, treatment suggestions, and discharge criteria
- Follow up instructions built in

Asthma in the ER (Objectives)

- 1) Assess asthma severity
- 2) Treatment
- 3) Discharge criteria
- 4) Discharge instructions

The Problem

- Chronic inflammatory lower airway disease characterized by airflow obstruction that is reversible with medication.

CAN'T EXHALE



First question

- What is the diagnosis?
- Seems straightforward, but.....

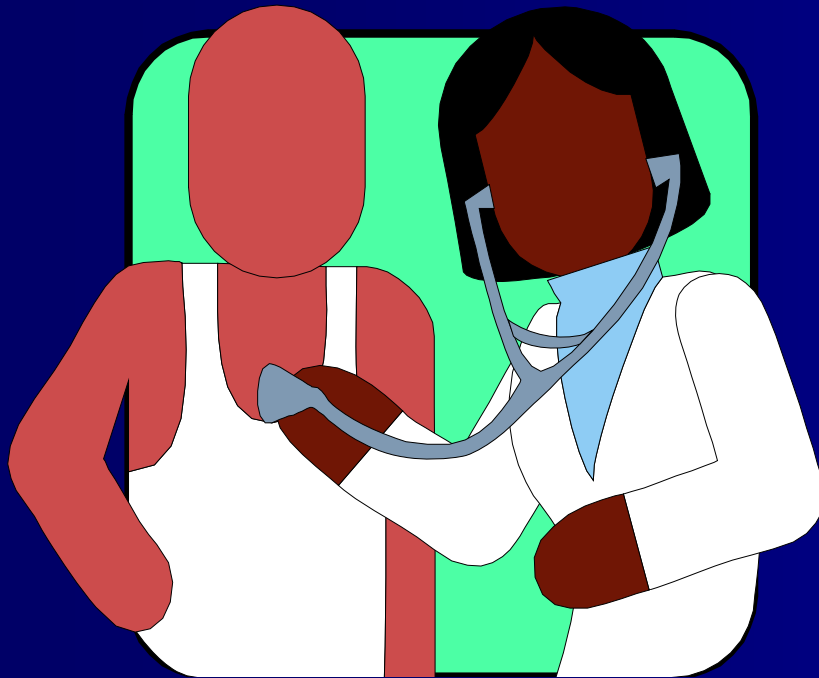
“All that Wheezes is not always Asthma”

- Pneumonia
- FB aspiration
- GER
- Rhinosinusitis
- Anaphylaxis
- CHF

... but most wheezing is asthma

Asthma In the ER Case

#1



- Case One 'Jackie'
- 15 year old female
- Short of breath
- Asthmatic
- Can only speak 2-3 words at a time
- *What else do you want to know?*

History

- Typical episode
- sudden onset
- course/duration of this attack
- treatment before arrival
- medications and last dose
- allergies/ inflammation

History continued

- Previous ER visits
- Previous hospitalizations
- previous intubations/ ICU
- previous steroids
- usual triggers
- seasonal variation

Clinical situation

- Mental state
- vital signs
- wheezing
- accessory muscle use/indrawing
- objective measures:
PFR, FEV1, O2 Saturation

How severe is the asthma?

- any asthmatic patient, even with very mild disease or lack of symptoms for many years, can present with a sudden, severe, life-threatening exacerbation

Jackie continued

- Smoker
- on BCP
- Ventolin hourly and now “not working”
- 2nd puffer, “never uses”
- URI x 1 wk.
- Past admits, steroids IV, no intubations

Jackie continued

- T 37, BP 140/70, Pulse 110 NSR
- Pulsus paradoxicus 22
- O2 sat 92% Can't do PFR
- Alert oriented, no hives
- diffusely wheezy, air entry equal bilaterally
- Trachea midline, No crepitations
- Mild accessory muscle use, exam other N

Jackie continued

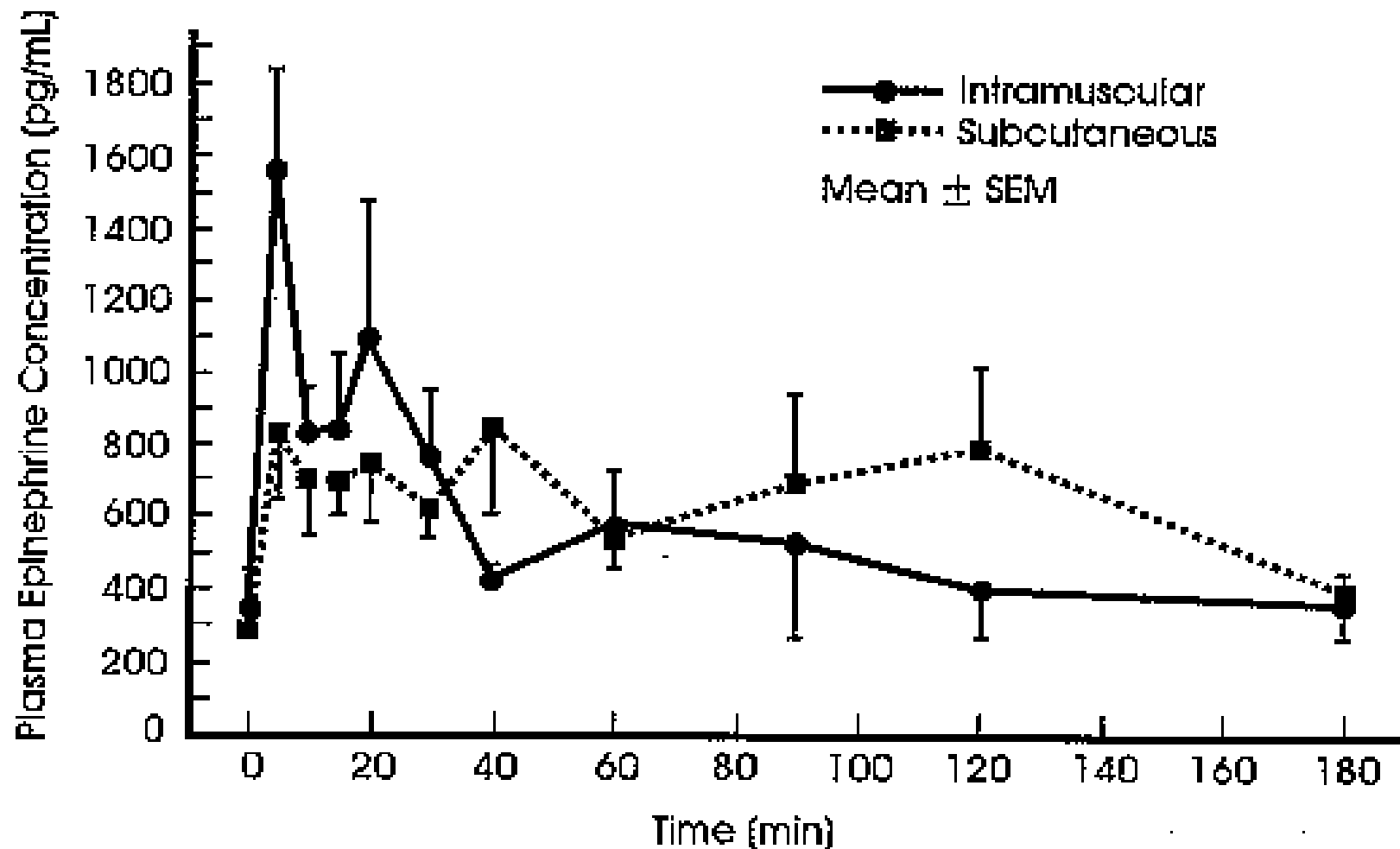
- T 37, BP 140/70, Pulse 110 NSR
- Pulsus paradoxicus 22
- O2 sat 92% Can't do PFR
- Alert oriented, **no hives**
- diffusely wheezy, air entry equal bilaterally
- Trachea midline, No crepitations
- Mild accessory muscle use, exam other N

Hives: consider this as ?

- If Anaphylaxis, how do you give Adrenaline?

IM vs S/C administration of Epi in children

Simons E et al, JACI 1998;101(1)

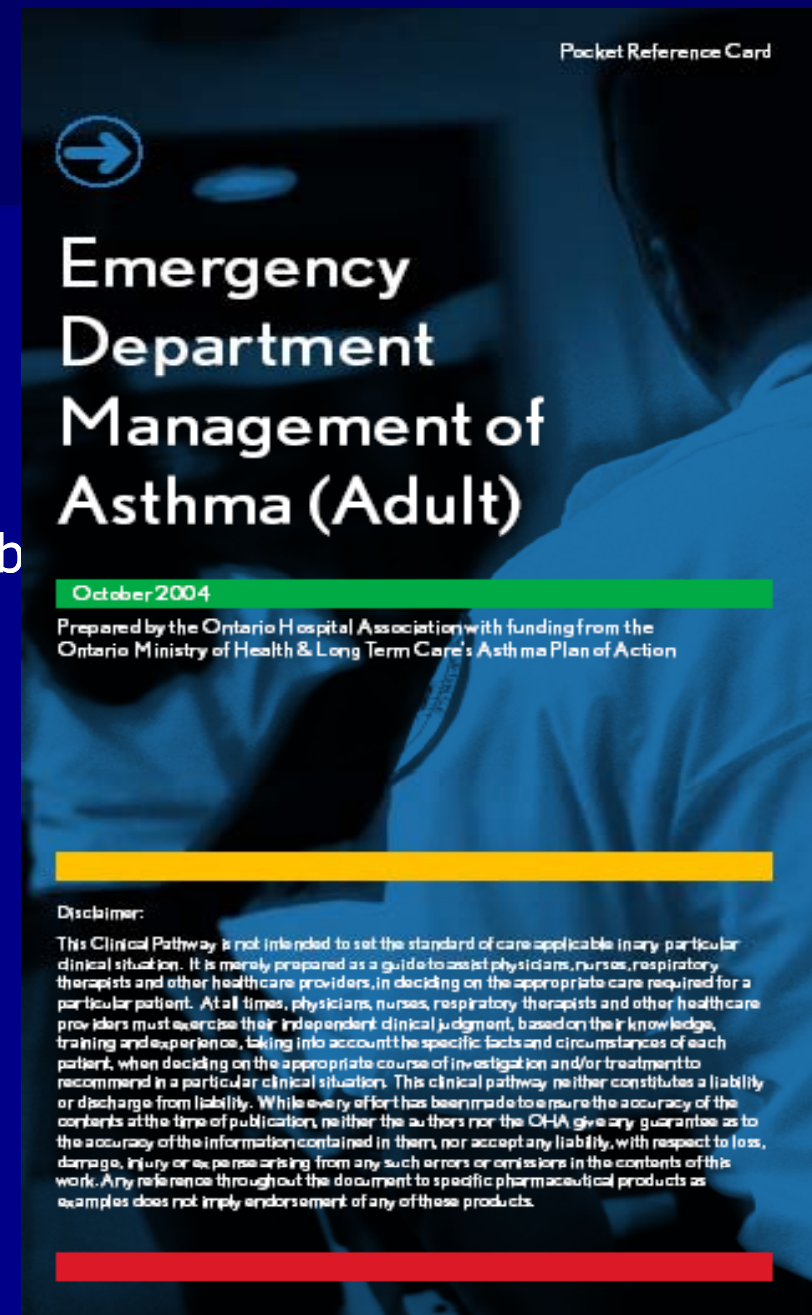


And..

- The data shows that **earlier** administration of Adrenaline, within the first hour is more important as it prevents the late phase reaction!

ED Asthma Care Project: Key Aspects

1. Accurate assessment of severity
 - CTAS triage, Hx, frequent vitals & SaO₂, spirometry or PEFr
2. Appropriate treatment
 - Timely β_2 -agonist, systemic steroid in all but mildest cases
3. Appropriate discharge prescriptions
 - β_2 -agonist, inhaled and/or oral steroid
4. Appropriate education prior to discharge
 - Teaching checklist
5. Comprehensive discharge instructions
6. Follow-up care arranged and discussed



Near death

- Exhausted, confused
- Diaphoretic, cyanotic
- Silent chest, Decreased resp effort
- Falling heart rate

- Sat < 90%
- PFR/FEV1 not obtainable

Severe

- Laboured respirations
- Agitated Diaphoretic
- Difficulty speaking
- Tachycardia
- No relief with prehospital B2's

- PFR/ FEV1 <40% , if at all possible
- Sat <90%

Moderate

- Dyspnea at rest, cough
- congested, chest tightness
- nocturnal symptoms
- partial relief with B2's

- PFR/FEV1 40-60%

Mild

- Exertional dyspnea and cough
- +/- nocturnal symptoms
- increased use of B2
- better response to B2's

- FEV1 > 60%

Medication Guideline

Medication dosing

- β_2 -agonist
- Anticholinergic
- Corticosteroid
- Magnesium sulfate
- Epinephrine
- Intubation agents
- Methylxanthine

Discharge treatment plan

PEF Nomogram

Medication Guidelines for Emergency Management of Adult Asthma

EMERGENCY DEPARTMENT TREATMENT

*Supplemental oxygen to keep SpO₂ 92% or more

Medication Doses

β_2 -agonist: first line therapy – titrate to response
e.g. inhaled salbutamol

- pMDI + spacer (100 mcg/puff): 4 - 8 puffs q15 - 20 minutes 3 times is usual. For FEV₁ or PEF less than 40%, increase to 1 puff q30 - 60 seconds (4 - 20 puffs) prn (within patient's tolerability)
- Wet nebulizer solution (5 mg/mL): 5 mg (1 mL) in 3 mL 0.9% sodium chloride q15 - 20 minutes 3 times; continuous if necessary
- Administer with oxygen if SpO₂ is less than 92%
- Increase dose for intubated patients

Salbutamol (IV solution only)

- Load: 4 mcg/kg (over 2 - 5 minutes)
- IV infusion: 0.1 - 0.2 mcg/kg/minute

Stock respirator solution or nebulas acceptable

Anticholinergic
e.g. inhaled ipratropium bromide

- pMDI + spacer (20 mcg/puff): 4 - 8 puffs q15 - 20 minutes 3 times is usual; increase to 1 puff q30 - 60 seconds (4 - 20 puffs) prn
- Wet nebulizer solution (250 mcg/mL): 250 - 500 mcg (1 - 2 mL) in 3 mL 0.9% sodium chloride q15 - 20 minutes 3 times is usual
- Decrease frequency in recovery phase
- May be mixed with β_2 -agonists and adjust the volume of 0.9% sodium chloride to keep total volume between 3 and 4 mL

Corticosteroid

- Prednisone PO: 50 mg tablets
- IV methylprednisolone: 40 - 125 mg IV; dilute in 50 mL of D5W or 0.9% sodium chloride over 15 to 30 minutes once
- IV hydrocortisone: 250 - 500 mg IV; dilute in 50 to 100 mL of D5W or 0.9% sodium chloride over 15 to 30 minutes once

Magnesium sulfate

- IV magnesium sulfate (0.5 g/mL): usual is 2 g (4 mL) in 100 mL D5W over 20 minutes once

Epinephrine (IM or IV)

- IM 0.3 - 0.5 mg (0.3 - 0.5 mL) every 20 minutes as necessary; comes as 1 mg/mL (1:1000) solution in 1 mL ampoules
- IV single dose: dilute 1 mL of 1:1,000 solution (1mg/mL) with 9 mL 0.9% sodium chloride (= 1:10,000 dilution) and give 1 mL IV over 5 - 10 minutes
- IV infusion: dilute 2 mL of 1:1,000 solution (1 mg/mL) in 250 mL of D5W (= 8 mcg/mL) and infuse at 1 - 4 mcg/min (= 7.5 - 30 mL/hr)

Intubation agents

- Induction: ketamine 1.5 mg/kg IV (give as a bolus and may be an effective bronchodilator at doses of 2 - 3 mg/kg), OR propofol 2 - 2.5 mg/kg IV (start with 1 mg/kg); +/- midazolam 0.1 - 0.3 mg/kg IV
- Paralysis: succinylcholine 1.5 mg/kg IV; OR IV rocuronium 1 mg/kg IV

NOTE: Intubated/ventilated patients may require ongoing sedation +/-

Methylxanthine (e.g. aminophylline)
Not recommended as bronchodilator in the first 4 hours of treatment

- Load: 3 - 6 mg/kg IV over 30 minutes (reduce dose by 50% if already taking aminophylline or theophylline)

DISCHARGE TREATMENT PLAN

Medications

A. β_2 -agonist (rapid-acting)

1. Regular use often required for 48 hours (2 - 4 puffs q4 hours)
2. PRN use after 48 hours if symptoms controlled
3. If unable to control symptoms with β_2 -agonist, instruct patient to return to Emergency Department or to see their family physician

B. Corticosteroid

1. Prednisone: 30 - 60 mg/day PO for 7 - 14 days; taper not necessary
2. Individualize management plan based on past treatment/recent symptoms
3. Inhaled: Continue at previous dose even if taking prednisone. If steroid naive, initiate daily inhaled therapy (fluticasone/budesonide/ beclomethasone/ciclesonide) inhaled 1000 - 2000 mcg / day. Consider as integral part of long-term management

C. Additional Therapy (leukotriene receptor antagonist, long-acting β_2 -agonist)

1. Continue use of previously prescribed agents on discharge

Peak Expiratory Flow (PEF) in Normal Adults (L/min)

Height	142	147	152	157	163	168	173	178	183	188	193	198
Inches	56	58	60	62	64	66	68	70	72	74	76	78
MALES												
Age	20	25	30	35	40	45	50	55	60	65	70	75
Mean PEF	535	545	554	563	571	579	587	594	601	608	614	621
25	560	570	580	589	598	607	615	622	630	637	643	650
30	574	584	594	604	613	621	629	637	645	652	659	666
35	579	589	599	609	618	626	635	643	650	657	664	671
40	577	587	597	607	616	624	633	641	648	655	662	669
45	570	581	591	600	609	618	626	633	641	648	655	661
50	560	570	580	589	598	606	614	622	629	636	643	649
55	547	557	566	575	584	592	600	608	615	621	628	634
60	532	541	551	559	568	576	583	591	598	604	611	617
65	515	524	533	542	550	558	565	572	579	585	591	597
70	497	506	515	523	531	538	545	552	559	565	571	577
75	479	478	496	504	511	518	425	532	538	544	550	555
FEMALES												
Age	20	25	30	35	40	45	50	55	60	65	70	75
Mean PEF	447	454	460	456	471	476	481	486	490	495	490	503
25	458	465	471	477	482	488	493	497	502	506	511	515
30	462	469	475	481	486	492	497	502	506	511	515	519
35	461	468	474	480	485	491	496	501	505	510	514	518
40	457	463	469	475	481	486	491	496	500	505	509	513
45	449	456	462	468	473	478	483	488	493	497	501	505
50	440	447	453	458	464	469	474	478	483	487	491	496
55	430	436	442	447	453	458	462	467	471	475	479	483
60	418	424	430	435	440	445	450	454	458	462	466	470
65	406	412	417	422	427	432	437	441	445	449	453	456
70	393	399	404	409	414	419	423	427	431	435	438	442
75	380	385	391	395	400	404	409	413	416	420	424	427

*Adult Normal Range (2 SD) = mean \pm 80 L/min
Values calculated from Nurin and Gregg; BMJ 1989; 298: 1068-70
The above table is meant to be used only as a guide. Normal standards will vary between racial and ethnic groups.

Consent adapted with permission from: Beveridge et al. Guidelines for the emergency management of asthma in adults. CAEPCTS Asthma Advisory Committee, Canadian Association of Emergency Physicians and the Canadian Thoracic Society, CMAJ 1996; 155(1):23-37 and Kingston General Hospital "Adult Asthma Collaborative Care Plan" Medication Guidelines.

Treatment

- O₂
- Inhaled B₂
- Inhaled anticholinergic
- Systemic steroids
- Others IV B₂, Adrenaline,
 Methylxanthines,
 Magnesium, Heliox
- Intubation/NIPPV

Initial management- O₂

- Weak bronchodilator?

High-flow non-rebreather system

FIO₂

nasal cannula	30%
simple face mask	50-60%
non-rebreather	80%

- Provide if O₂ saturation < 92%

No Brainer, Right?

O₂

Food for thought

Effects of short-term 28% and 100% oxygen on arterial carbon dioxide tension and peak expiratory flow rate in acute asthma: a randomized trial.

- Chest 2003; 124:1312–1317 Rodrigo GJ, et al.

- randomized controlled study (effect of administration of two oxygen concentrations (28% vs 100%) on gas exchange in AA) showed that:

- patients on 28% oxygen had a fall in PaCO₂ rise in PEFR
- patients on 100% oxygen had an increase in PaCO₂ , fall in PEFR

Hypothesis:

- regional release of hypoxic pulmonary vasoconstriction and subsequent worsening of V/Q mismatch

Recommendations

treatment guidelines should be based on achieving target PaO₂ and SpO₂ rather than on administering predetermined concentrations or flow rates of inspired oxygen

B-agonist **NOT ONLY**

- Rapid onset
- Airway smooth muscle relaxation

but also...

- Enhances water output from mucous glands
- Improvement of mucociliary clearance
- ?anti-inflammatory effects

Initial management- Inhaled B-agonist

HOW ?

WHAT ?

WHEN ?

Initial management- Inhaled B-agonist: Controversies

- SVN vs. MDI-S
- Facemask vs. mouthpiece
- Continuous vs. intermittent
- *{Racemic albuterol vs. levalbuterol}*

Question.

Nebulized treatment is overall better than MDI-S because...

- More effective delivery
- Costs less
- Decreases ED LOS
- Decreases hospitalizations
- None of the above

Remember:

1) Cost benefit analysis

2) Downside risk?

- Infection risk of nebulized medications
or of NIPPV
- Lessons of SARS

Something to consider...

- **Heliox-Driven Ventolin**

Kim K.-Peds Nov. 05

n=30 m/s asthma, rct 70/30—50/50

-The mean change in PI score from baseline to 240 minutes or ED discharge was 6.67 for the heliox group compared with 3.33 for the oxygen group. Eleven (73%) patients in the heliox group were discharged from the hospital in <12 hours compared with 5 (33%) patients in the conventional group.

Initial management- Inhaled B-agonist

SUMMARY

- Standard of care
- Use of either SVN or MDI-S reasonable with MP if possible
- Intermittent treatment probably better
- Niche for levalbuterol is being defined

B2 Agonist

Salbutamol (100mcg/puff):

- 4 - 8 puffs via spacer device, STAT & q15-20 minutes X 3 prn or
- 4 - 20 puffs via spacer device, 1 puff q30-60 sec prn (*For FEV1 or PEFr less than 40% predicted, within patient's tolerability:*) or
- Nebulized Salbutamol (5 mg/ml):
_____ ml in 3ml 0.9% sodium chloride X _
- Or- Continuous nebulized

Initial management- Ipratropium

- Anticholinergic
- Blocks acetylcholine mediated B-constriction
- Safe (clinically insignificant Sfx)
- Peak effect 60-90 minutes
- ? Effect with MDI administration
- Frequency of administration post first hour:?

Initial management- Ipratropium

- *Schuh, J Ped 1995/Qureshi, NEJM 1998/ Plotnick, Ducharme, Br Med J 1998*
 - "multiple early doses superior "
 - "more marked benefit for sicker children"
 - "no serious side effects"

Anticholinergic

- For moderate to severe asthma
- Ipratropium bromide MDI + spacer (20 mcg/puff) - usually **4 – 8 puffs** inhaled q15 – 20 minutes for 3 doses:

OR

- Nebulized ipratropium (250 mcg/mL) –
- usually **250 – 500 mcg (1 – 2 mL)** in 3 mL *0.9%* sodium chloride q 15 – 20 minutes for 3 doses with continuous nebulization if necessary:

OR

- Continuous nebulized ipratropium:

Initial management- Corticosteroids

- Decrease a/w inflammation
- Inhibit down-regulation of B-2 receptors
- Decrease a/w hyperresponsiveness
- Potentiate B-agonist effects
- Other positive effects??

Corticosteroids in the ED

- Rodrigo et al. Chest 1999; 116:285–295
 - Rowe et al. BH, The Cochrane Library, Issue 4. Oxford, UK: Update Software, 2002
-

- “require > 6 to 24 h to improve pulmonary function”
- “IV and oral equivalent effects”
- “tendency toward greater and more rapid improvement in pulmonary function with medium and high doses, although these effects likely plateau without additional benefit at very high dosing”

Initial management-Which Corticosteroid?

- Qureshi, J Ped 2001

- R-DB, 533 children, all-comers

- prednisone (2 mg/kg then 1 mg/kg x 4d)

VS.

- DXM (0.6 mg/kg then 0.6 mg/kg x 1)

- "no difference between: admission/relapse rates"

- "lower rates of emesis and non-compliance with DXM)"

Initial management- Corticosteroids

- Devidayal, Acta Paediatr 1999
 - Budesonide 800 mcg x 3 vs. prednisone
 - “better improvements in O₂ saturation, RR, asthma scores”
 - “decreased LOS”

Initial management- Corticosteroids: kids

- In moderate to severe exacerbation
- Mild exacerbation but already on B-agonist and inhaled steroids at home
- Prednisone 1-2 mg/kg ASAP
- Alternatives: DXM (p.o., neb.(?), i.m.)
MP (i.v.)
Budesonide neb.(?)

Steroids: adults

- Prednisone 50 mg po
- +/- inhaled steroids

Consider inhaled Fluticasone 500 ug
or equivalent q10 min x 1 hr

Or

IV steroids:

Methylprednisolone (usually 125 mg) or
Hydrocortisone (usually 500 mg)

Magnesium Sulfate

- ?counteracts calcium ions to prevent bronchial smooth muscle contraction
- Vascular stabilizing effect
- inhibits the release of histamine from mast cells

Magnesium Sulfate

- *Rowe, Ann Emerg Med 2000*
 - meta-analysis: 7 RCT (668 patients)
 - “modest differences in admission rates, FEV1, PEFr in only severe patients”

Magnesium Sulfate

- No role in mild to moderate disease
- ? Beneficial in severe disease
- Optimum dose ?
- Few side effects
(flushing/hypotension)

New ideas??

- Blitz M - *Chest* - 01-JUL-2005; 128(1): 337-44

Aerosolized magnesium sulfate for acute **asthma**: a systematic **review**

The use of nebulized MgSO(4), particularly in addition to a beta(2)-agonist, in the treatment of an acute **asthma** exacerbation appears to produce benefits with respect to improved pulmonary function and may reduce the number of hospital admissions.

What if she was tiring and worse?

- *Magnesium sulphate** - usually 2 grams (4 mL) in 100 mL IV fluid over 20 minutes once:
- *Epinephrine**: (IM, IV or SC. IM preferred over SC). Comes as 1 mg/mL (1:1000) solution in 1 mL ampoules.
Epinephrine 0.1 mg IV over 5 – 10 minutes (1:100,000 dilution) once now. **OR**
Epinephrine _____mcg/min (1 – 4 mcg/min) IV infusion. **OR**
Epinephrine 0.3 mg (0.3 mL, 1:1000) _____(IM or SC) once now.

Getting sleepy.....

- Consider: Methylxanthines, inhalational anesthetic and/or IV beta agonists
- Methylxanthines*: Not usually recommended as bronchodilator in the first 4 hours of treatment
- **Aminophylline: Load: 3 - 6 mg/kg IV over 30 minutes** (1/2 if already taking aminophylline or theophylline)
Infusion: 0.2 – 1 mg/kg/hour (follow levels).
- Rapid Sequence Intubation (if required):
- ensure adequate hydration peri-intubation.
- Induction: IV Ketamine 1.5 mg/kg
- Paralysis: IV Succinylcholine 1.5 mg/kg
- Maintenance of paralysis: IV rocuronium 0.6 mg/kg
OR IV cis-atracurium 0.6 mg/kg (0.3 mg/kg bolus
then infusion 2 - 10 mg/h titrated to train of four testing)

"The Kitchen Sink" and the Future?

- Heliox: (turbulent flow and a/w resistance) "limited role in asthma" —Kudukis, J Ped 1997
- Use of helium-oxygen mixtures in the treatment of acute asthma: a systematic review.
- Rodrigo GJ - *Chest* - 01-MAR-2003; 123(3): 891-6
"The existing evidence does not provide support for the administration of helium-oxygen mixtures to emergency department patients with moderate-to-severe acute asthma."
- Ketamine: (bronchodilator) Pre-Post? Both?
- Allen JY —Ann Emerg Med- July-2005
"ketamine drip *provided no incremental benefit to standard therapy*"
- Leukotriene receptor antagonists: (block effects of bronchoconstricting mediators) ?role in acute Tx
...further work needed

-Silverman, Ann Emerg Med 1999

-Camargo, Acad Emerg Med 2001

Investigations

- CXR:
 - is there a complication like a pneumo or a precipitant like pneumonia
 - when therapy is not working?
- ABGs.. What does a “normal” pCO₂ mean?
- Electrolytes.... Why??
- Others?

Intubate at your own Peril

**"Only Absolute
Indication:
Respiratory Arrest"**

Intubate at your own Peril

Problem:

Can't exhale ! ! !

Intubation=

being hooked up
to a
machine that helps
with INHALATION

PRE-Intubation Issues

- When?...don't rely solely on BG
- Prepare well, use "best" personnel
- RSI: Induction agent?

Getting sleepy.....

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then infusion 2 - 10 mg/h titrated to train of four testing)

POST-Intubation issues

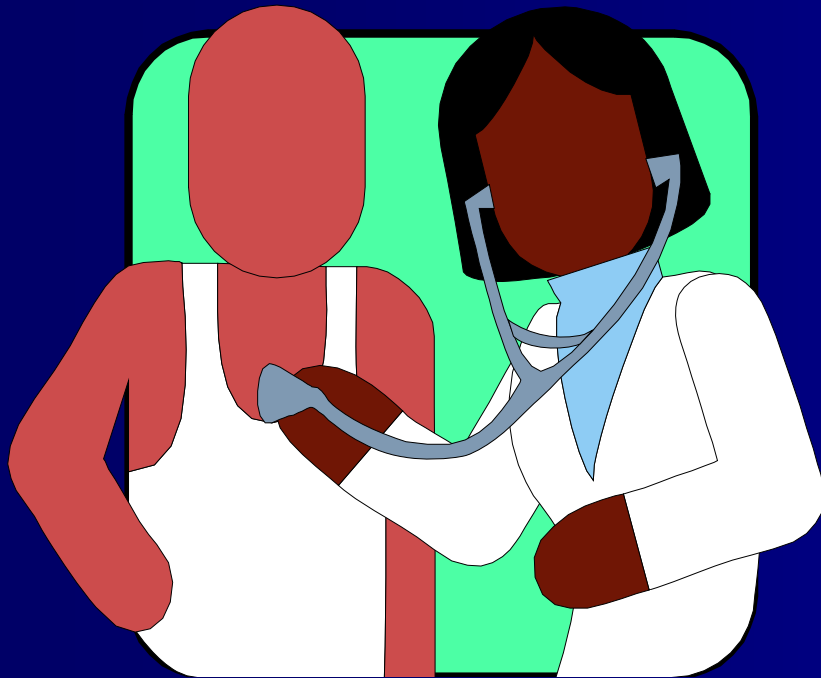
- Keep PIP <40 (>60...barotrauma)
- Watch for stacking of breaths-prolong expiratory phase
- Decrease tidal volume (7-8cc's/kg) and RR "permissive hypercapnia"
- Now use ketamine (bronchorrhea is your friend)
- Manually help with exhalation?
- Continue B-agonist
- inhalation anesthetic agents (direct bronchodilators, decrease airway responsiveness, decrease histamine-induced bronchospasm)

NI-PPV: Research Lacking

Jackie continued

- Smoker
- on BCP
- Ventolin hourly and now “not working”
- 2nd puffer, “never uses”
- URI x 1 wk.
- Past admits, steroids IV, no intubations

Further course



- 15 min. after mask #1
- chest still wheezy
- HR 120
- 125/70, Pulsus 12
- Sat 94% on 6L O2
- PFR 120

Further course



- After mask #2 (~1 hr.)
- mildly wheezy,
- PFR 170, Sat 96% (6L)

RX?

Investigate?

Time to go home?



- After 3rd mask (2hr)
- Chest occ 'squeak'
- PFR 350,
- Sat 96% (off O2x 20')
- "I want to go home"
- *Can she??*

What about triggers

- This is a great educational opportunity!
- “Who smokes at home?”

Discharge considerations

- Spirometry
- Pretreatment
 - FEV1 < 25%, < 1L admission likely
- Post-treatment
- < 40% admission recommended
- 40-60% discharge possible
- > 60% discharge likely
- **CONSIDER RISK OF RELAPSE!**

Risk of relapse

- Previous near death episodes
- Previous ER visits
- Frequent hospitalizations
- Systemic steroid use or dependance
- Sudden attacks
- Anaphylaxis allergic triggers at home?
- Prolonged duration of attack
- Poor compliance or understanding
- Returning to same environmental triggers?

Discharge instructions

- B2
- Steroid
- Return prn if....
- Review drug delivery and devices
- Explain roles of relievers vs. preventers
- Trigger advise
- Follow up

Education Checklist

- “Working Document”
- Interdisciplinary
- Documentation tool
- “Cheat Sheet”
- Consistent messaging
- Education can be delivered at each patient contact
- Reminder to address potential patient barriers

Emergency Department Asthma Care Pathway Adult: 16 years and over Education Checklist	
MD/Nurse/RT - Education Checklist	
Learning Goals Reviewed with Patient (To be completed by MD/Nurse/RT)	Initials & Comments
1. Assessed device/spacer technique and demonstrated optimal technique: <ul style="list-style-type: none"> • Shake canister, place end of pMDI into holding chamber, breathe out, place holding chamber mouthpiece into mouth and make a seal, release puff, inhale slowly (no whistle), hold for 10 seconds, exhale, wait 30 seconds between each puff of the same pMDI. 	
2. Reviewed basics of asthma: <ul style="list-style-type: none"> • Airway inflammation (swelling), increased mucous, and bronchospasm • Airways narrow and cause the symptoms of asthma: cough, wheeze, chest tightness and/or shortness of breath 	
3. Reviewed asthma triggers: <ul style="list-style-type: none"> • Not everyone with asthma has the same triggers. • Important to know what your asthma triggers are. • Trigger avoidance can reduce the amount of medication needed to control your asthma and can reduce your asthma symptoms. 	
4. Reviewed asthma medications: <ul style="list-style-type: none"> a. Relievers (e.g. Airomi[®], Apo-Salvent[®], Bricanyl[®], Novo-salmol[®], salbutamol, or Vertolin[®]) <ul style="list-style-type: none"> • Relax smooth muscle around airways. b. Prednisone <ul style="list-style-type: none"> • Treats severe airway inflammation and mucous; c. Controllers (e.g. Advair[®], Alvesco[®], beclomethasone, Flovent[®], Pulmicort[®], QVAR[®], or Symbicort[®]) <ul style="list-style-type: none"> • Treat airway inflammation and mucous; • Need to be taken regularly even when feeling well. 	
5. Reviewed parameters for acceptable asthma control (below) and when to return to the Emergency Department (on front). <ul style="list-style-type: none"> • Symptoms less than 4 days per week • Reliever use less than 4 times per week (not including prior to exercise); • Not waking at night or early in the morning with symptoms. 	
6. If patient does not have a drug plan, refer to Social Work (if available) or the Trillium Program (applications usually available at the local pharmacy).	
7. If patient does not have a family physician, ED physician notified and alternatives discussed (if available).	
8. Front of patient discharge instructions reviewed with patient and copy given to patient.	
9. Hospital's Asthma (if available) or Lung Association Booklet given to patient.	
Name (print): _____ Signature: _____ Status: _____	
Date (mm/dd/yyyy): _____ Time: _____	

"Quick Facts About Asthma"

Essential Components

- Basics about asthma
- Symptoms
- Triggers
- Medications
- Control
- Life threatening

QUICK FACTS ABOUT ASTHMA...

What is Asthma?

- Asthma affects the airways (bronchi) in your lungs.
- Three main things happen in your airways when you have asthma:
 - The lining of your airways swell and make more mucous
 - The airways become sensitive or twitchy to triggers
 - The muscles that wrap around your airways tighten
- These changes make your airways narrow and cause the symptoms of asthma.
- Symptoms of Asthma can include:
 - wheezing
 - chest tightness
 - shortness of breath
 - coughing
- You may have one or a combination of any of these symptoms

Asthma Triggers:

Examples of asthma triggers include: smoking, respiratory infections/colds, allergies (such as animals, dust mites, pollens, moulds, cigarette smoke), strong odours, air pollution, exercise, high humidity, stress and cold air.

- Not everyone with asthma has the same triggers.
- It is important to know what triggers your asthma.
- Avoiding things that trigger your asthma can reduce the amount of medication needed to control your asthma and can reduce your asthma symptoms.

Asthma Medications:

There are three major categories of medications used to treat asthma:

1. **Relievers Bronchodilator** – (e.g. Airomir®, Apo-Salvent®, Bricanyl®, Novo-salmol®, salbutamol, or Ventolin®)
 - relax the muscles that tighten around the airways;
 - used to treat asthma symptoms; provide relief within minutes,
 - are taken on an as needed basis when you are well.
2. **Prednisone** – (white pill)
 - used to treat severe airway inflammation and mucous;
3. **Controller Inhaled Steroids** – (e.g. Advair®, Alvesco®, beclomethasone, Flovent®, Pulmicort®, QVAR®, Symbicort®, or Vanceril®)
 - used to treat airway inflammation and mucous;
 - control asthma symptoms and prevent asthma from flaring;
 - need to be taken **regularly** even when you start to feel well.

Your Asthma Is In Control If:

- You have symptoms (cough, wheeze, chest tightness or shortness of breath) **less than** 4 days per week
- Use your reliever **less than** four times per week (not including prior to exercise);
- Not waking at night or early in the morning with symptoms.

REMEMBER...Asthma can be LIFE THREATENING, especially IF NOT TREATED

IF YOU HAVE QUESTIONS ABOUT ASTHMA CALL:

The Lung Association - Asthma Action Helpline

1-800-668-7682 (toll-free) or visit online: <http://www.on.lung.ca>

Asthma in ER Key concepts

- Exacerbations - potentially life threatening
- Treatment takes precedent over assessment
- Monitor closely, reassess frequently
- B2 titrated to effect
- Corticosteroids are integral part of therapy
- All patients need reassessment prior to dis.
- Treatment plan Follow-up

ED Adult Asthma Care Pathway: Components

1. Physician Orders

- 2 pages
- Sequential, evidence based management
- Medication Guidelines on back

2. Patient Discharge Instructions

- 2 copies
- Original stays on chart
 - education checklist on back
- Copy goes home with patient
 - Quick facts about asthma on back
- D/C medication instruction
- Patient follow-up instruction
- When to return to ED

These complement hospitals' standard forms for:

- Triage
- Nursing documentation
 - vitals
 - medication
 - progress notes

FAMILY PHYSICIAN AIRWAYS GROUP OF CANADA



Asthma Action Plan

Patient Name _____ Date _____

Physician _____

Your Triggers: _____

Symptoms (Cough, Shortness of Breath, or Wheezing)	Action	Best Peak Flow _____
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Enjoying usual activities Meeting Reliever use less than 4 uses a week No cough or wheeze at night No days off work/school	Controller Medication _____ _____ _____	Range _____ (85-100% Predicted Best)
Feel free to use your Reliever medication before exercise	Reliever Medication _____ _____	

Yellow = Loss of adequate control of asthma

Meeting Reliever more than 3 uses a week Cough or wheeze at night more than 1 night a week Unable to do usual activities due to asthma Change a "bad"	Controller Medication _____ Take _____ puffs _____ uses a day of your _____ usual peak flow returns to normal or symptoms disappear for _____ days a week Increase Reliever up to every _____ hour	Range _____ (60-85% Predicted Best)
Feel free to use Reliever medication before exercise	Take _____ Reliever for _____ days	

If you are feeling worse, contact your Doctor's Office

You are awake You have shortness of breath at rest You are unable to walk If you know what your symptoms are they are a severe attack	Go to the Nearest Emergency	Range _____ (<60% Predicted Best)
Take 2 puffs of your reliever every 10 minutes while travelling to hospital or waiting for help Do not stop until directed to do so by help		

Developed by Dr. Henry O. O. Squire, M.D., Denver, CO



HOUSE M.D.

"You can think I'm wrong,
but that's no reason to quit thinking."

The diagnosis here is clearly
**acute IPCRG Toronto
deficiency.**

You must go to Toronto in
June 2010, or you will suffer
Horrible medical consequences