

Drugs for ASTHMA and COPD

1

الدكتور اوس علي كاظم  
اسم المريض: جنيد ارکان العمر: ٢٢ سنة

Rx  
**Salbutamol**(ventolin®)  
(100mcg/metered inhalation)  
Inhaler  
1-2 puff q.i.d PRN  
التاريخ ٢٠١٤/ /

Q1-Why does the **inhalation route** is commonly used to deliver drugs for asthma and COPD?

[ ]

Q2-Knowing that Salbutamol is a **short acting B2- agonist**. Is it suitable for the relief of an **acute** asthmatic attack (**reliever**)? Is it usually prescribed as PRN (as required) or as a **regular treatment**? [ ] [ hint: see selective B2- agonist]

Q3-**Counsel** the patient about his medication [including **proper use of the inhaler** (see the supplement on how to use different dosage forms provided in the 1<sup>st</sup> course)]?

2

the physician noticed that patient has frequent asthmatic attacks and he has **difficulties in breath-hand coordination** therefore he write the Rx no. 2

Rx  
**Terbutaline** turbuhaler  
One inhalation q.i.d PRN  
**Budesonide** turbuhaler  
2 inhalation B.i.d

Q4- Why did the physician prescribe **turbuhaler** device instead of the inhaler device? [see supplement A ] Can we consider **terbutaline** as an **alternative** to Salbutamol? (i.e. is it suitable for an acute attack (reliever ) also)[ ]

Q5-Is the **Inhaled corticosteroid (ICS)** (Budesonide) used as a prophylactic (**preventer**) or as **reliever**? When will the **alleviation of symptoms** occurs after regular use of ICS? [ ](see 3.2 corticosteroid)

Q6- **Counsel** the patient about his medication (**including proper use of the turbuhaler** (See the supplement A)?

Q7-The patient notice that there is a **lack of sensation of the drug in the mouth!!!** Is this expected?

Hint : see 3.1.5 drug delivery devices

3

Few weeks later The patient begins to develop frequent **oral candidiasis**. The physician counsel you and you recommend to use inhaled **corticosteroid with spacer device**. The physician write RX 3 :

Rx  
**Terbutaline** turbuhaler  
One inhalation q.i.d PRN  
**Beclometasone** inhaler with spacer device  
4 puffs B.i.d

Q8-Why did the patient developed **oral candidiasis**? [ ]

Q9-Why you recommend using inhaler with the **spacer device**? [see supplement B ]

Q10-**Counsel** the patient about his medication (including proper use of the turbuhaler (supplement A) and **spacer device** (supplement B)?

4

The patient's asthma still uncontrolled , therefore the physician write Rx no. 4

Rx  
**Terbutaline** turbuhaler  
One inhalation q.i.d PRN  
**Beclometasone** inhaler with spacer device  
4 puffs B.i.d  
**Salmeterol** Accuhaler  
50mcg(1 blister) B.i.d

Q11-What is **salmeterol**? Can we use it for an acute attack (i.e. as reliever)? [ ] can we use it **alone**? [ ]

Q12- Is it used **regularly**? [ ]

Q13-Why the Dr. prescribed salmeterol **Accuhaler**? Is salmeterol **diskhaler** considered an alternative?[ supplement A]

5

The patient's asthma still uncontrolled , therefore the physician write Rx no.5

Terbutaline turbuhaler  
One inhalation q.i.d PRN  
**Beclometasone** inhaler with spacer device 4 puffs B.i.d  
**Salmeterol** Accuhaler  
50mcg(1 blister) B.i.d  
**Zafirlukast**(Accolate ®)20mg tab  
1 tab B.i.d  
**Omalizumab** 150-mg S.C injection

Q14-To which class of asthma drugs **zafirlukast** belong? What is its main **indication**?-What **counseling** (hint: see caution) and **advisory labels** should be given with it? [ ]

What is **Omalizumab** and when it is used? And on **what base its dose is calculated**? [ ]

Q15-If the Dr. recommends **Singulair®** 10mg tab. Once daily: **At what time of the day** it is given? And what **advisory labels** should be given with it [ ]

6

Later on the patient develop severe asthmatic attack and enter the emergency room in which the Dr. write treatment contain :  
**Ventolin 0.5 % (5mg/ml) nebulizer solution.**

2.5 mg (i.e. 0.5 ml) to be diluted to 4 ml and given by nebuliser with O2 over 5 – 10 minutes. PRN

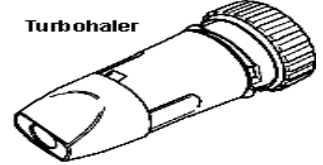
Q16-what is the usual **nebulizer diluent**? [ ]

<div>7</div> <p>الدكتور مهند اشراق خليل اسم المريض: وائل وميض العمر: ٤٤ سنة</p> <p>Rx <b>Becolmetasone</b> 100 mcg inhaler 1 puff bid <b>Salbutamol</b> 100 mcg inhaler 1 puff prn</p> <p>٢٠١٤/ / التاريخ</p> <p>You noticed that the patient comes <b>frequently asking for Salbutamol</b> inhaler for her deteriorated uncontrolled asthma. And he said that he does not need Beclometasone inhaler because <b>he had many of them unused previously.</b></p> <p>Q17-The patient had many unused Beclometasone inhaler!!! Why this had been happened? What course of action will you take? ملاحظة: الاجابات استنتاجية</p> <p>Q18-What are the usual <b>colors</b> of the <b>preventer</b> and <b>reliever</b> inhalers? See supplement. C</p>	<div>8</div> <p>الدكتور: ياسين ظافر فيصل اسم المريض: مثنى خليل العمر: ٣٣ سنة</p> <p>COPD</p> <p>Rx <b>Phyllocontin®</b> 225mg m/r tab. 1tab B.i.d</p> <p>٢٠١٤/ / التاريخ</p> <p>Q19-What is <b>Phyllocontin®</b>? And what is the <b>main indication</b> for it? [ ]</p> <p>Q20-The patient noticed that changing the <b>brand name</b> only of his m/r tab. Produce variable response. Rationalize? What do you recommend? [ ]</p> <p>Q21-If the patient <b>cannot swallow</b> phyllocontin tab. Could he crushed it Before swallowing? Why? [ ] How you can solve this problem using <b>Slo-phyllin® cap. Containing m/r granules?</b> [ ]</p> <p>Q22-If the patient is <b>heavy smoker</b>. What phyllocontin tab. Preparation is suitable for him? Why? [ ]</p>	<div>9</div> <p>الدكتورة رشا عودة أهليل اسم المريض: كمال ياسر العمر: ٧ سنة</p> <p>Rx <b>Phyllocontin®</b> 225mg m/r tab. 1/2 tab B.i.d. <b>Formoterol</b> 4.5 mcg turbuhaler 1-2 inhalation PRN</p> <p>This Rx unfortunately was dispensed as it is. The father came to your pharmacy and said that her daughter complains of <b>palpitation, nausea and headache</b> after each use of the <b>tablet!!!</b></p> <p>Q23-What is the <b>problem</b> in this Rx? [ ]</p> <p>Q24-What is duration of <b>Formoterol</b>(short or long)? Is it useful for an acute attack(short term symptom relief)?Why? [ ] Can we use it for long term control of chronic asthma (i.e. taking it regularly)? [ ]</p> <p>Q25-Can we <b>add aminophylline injection</b> to this patient</p>
<div>10</div> <p>الدكتورة سمية إسماعيل اسم المريض: شهلاء ثامر العمر: ٥٠ سنة</p> <p>COPD</p> <p>Rx <b>Ipratropium bromide</b> (Atrovent®) inhaler 2 puff t.i.d</p> <p>Q26-To <b>which class</b> of asthma drug , ipratropium belong? What are the differences between it and <b>tiotropium</b>?[ ]</p> <p>Q27-During the use of Atrovent? The patient develops <b>dry mouth</b> and <b>headache</b>? Rationalize? [ ]</p> <p>Q28- 3 years later the patient develops <b>glaucoma</b>. Could he use Atrovent safely now?[ ]</p>	<div>11</div> <p>الدكتور سامر سلطان اسم المريض: محمد حسن العمر: ٢٠ سنة</p> <p>Exercise- induced asthma(EIA)</p> <p>Rx <b>Sod. Cromoglicate</b> spinhaler 1-2 inhalation 15-30min. before exercise</p> <p>Note: the patient also has <b>hyperthyroidism</b> and <b>difficulties in coordination.</b></p> <p>Q29- Knowing that B2-agonists are the <b>agent of choice for EIA</b>, why the Dr. not prescribes it? [ ]</p> <p>Q30-What is cromoglicate? And what is the main indication for it? Why the physician prescribed <b>spinhaler</b>? [ ]</p> <p>Q31-What are the <b>side effects</b> associated with the use of sod. Cromoglicate powder for inhalation (spinhaler)? [ ]</p>	<div>12</div> <p>الدكتور عمران منير اسم المريض: احمد نصير العمر: 4 اشهر الوزن: 4kg</p> <p>Rx <b>Salbutamol (Butadin®)</b> syrup 1 tsp t.i.d</p> <p>The Rx had been dispensed As it is by other pharmacist. And the infant develop <b>fine hand tremor</b> and palpitation after each dose!</p> <p>Q32-What is the most likely cause? What is your recommendation <b>Hint:</b> calculate the dose based on <b>body weight</b> مستعينا بكتاب BNF for children</p> <p>, calculate the equivalent no. of mls from syrup (conc. 2mg/5ml) and administer <b>orally</b> via the syringe)</p> <p>33-If the Dr. wants to prescribe an inhaler of ventolin. What <b>aiding device</b> should be given with the inhaler? [ see supplement D]</p>

## Supplement

**A**—أن عملية البخ اثناء الشهيق وليس قبله أو بعده (خطوة رقم ٥ من طريقة البخاخ) تسمى (Breath-hand coordination) وهي الخطوة الأصعب التي لا يحسنها معظم المرضى.....ولتلافي هذه الخطوة تم تصنيع الكثير من الاجهزة التي لا تحتاج الى coordination و من هذه الاجهزة مايكون على شكل (Aerosols (like Autohaler) ومنها مايكون على شكل Dry powder Inhalers (DPI) ومن امثلتها: (Turbuhaler, spinhaler, Accuhaler, diskhaler, Rotahaler, Clickhaler, Handihaler, Twisthaler, Cyclohaler, and Aerohaler) وجميعها لا تحتاج الى coordination لان المريض هو الذي يسحب الدواء عن طريق عملية شهيقة قوية وسريعة. كما يتضح من طريقة استعمال الـ turbuhaler التالية :

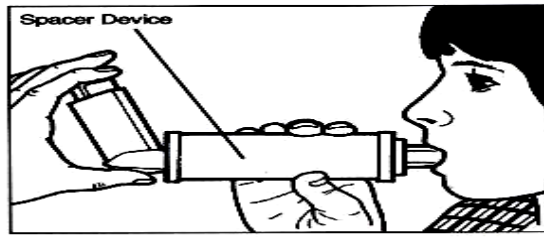
### (كيف تستعمل آل Turbuhaler)



- ١- اخرج الجهاز من غطاءه .
  - ٢- امسك الجهاز بحيث تكون الفتحة نحو الأعلى. ثم قم بتدوير الجزء الأسفل الملون تدويرا كاملا باتجاه واحد. ثم أرجعه بالاتجاه المعاكس حيث ستسمع صوت click
  - ٣- قم بعملية زفير بطيئة وكاملة لإخراج اكبر قدر ممكن من الهواء.
  - ٤- ضع فتحة الجهاز في الفم بين الأسنان وفوق اللسان.
  - ٥- خذ شهيقة سريعة وقوي وعميق ، ثم قم بإغلاق الفم بعد الشهيق مع حبس النفس لزمان يعادل زمن العد من الواحد إلى العشرة تقريبا.
  - ٦- قم بعملية الزفير من خلال الأنف وليس الفم. ( تجنب الزفير بالجهاز)
  - ٧- في نهاية كل عملية استخدام قم بمضمضة الفم بالماء جيدا مع رمي الماء خارج الفم وعدم بلعه.
- ملاحظة: قد لا تشعر بطعم الدواء في الفم وهذا لا يعني عدم وجود الدواء

**B**—إن هذا الجهاز لا يحتاج إلى عملية الـ (Breath-hand coordination) الصعبة وإنما يكون الشهيق بعد ألبخ وهذه عملية سهلة. كما انه يقلل من ترسب الـ ICS في الفم وبذلك يقلل الإصابة بالـ oral candidiasis

### (كيف تستعمل البخاخ مع spacer)



- ١- رج البخاخ جيدا.
- ٢- بعد الرج ، ارفع الغطاء الذي يغطي فتحة البخاخ والغطاء الذي يغطي فتحة آل spacer ، ثم ادخل البخاخ في آل spacer
- ٣- ، ثم قم بعملية زفير بطيئة وكاملة لإخراج اكبر قدر ممكن من الهواء.
- ٤- ضع فتحة آل spacer في الفم بين الأسنان وفوق اللسان.
- ٦- اضغط على البخاخ مرة واحدة.
- ٥- ابدأ بأخذ شهيق بطني وعميق ، ثم قم بإغلاق الفم بعد الشهيق مع حبس النفس لزمان يعادل زمن العد من الواحد إلى العشرة تقريبا.
- ٦- قم بعملية الزفير من خلال الأنف وليس الفم.
- ٧- في حالة استعمال أكثر من بخة واحدة. انتظر دقيقة واحدة على الأقل قبل تناول ألبخة الثانية بإتباع الخطوات السابقة نفسها.
- ٨- في نهاية كل عملية استخدام قم بمضمضة الفم بالماء جيدا مع رمي الماء خارج الفم وعدم بلعه.

يرجى الاطلاع اولا الى اول جدول في الفصل الثالث

(Management Of chronic asthma)

حيث توجد هناك مراحل تصاعدية للعلاج وحسب الحالة وقد روعيت هذه المراحل تقريبا في الوصفات الخمسة الاولى

**C-Relievers** (These inhalers are generally **coloured blue**): Short-acting, quick-onset drugs which produce relief from the symptoms of asthma. Examples: **salbutamol, Terbutaline**.

**Preventers** :( These inhalers are generally coloured **brown or orange**) : These drugs are normally corticosteroid based .Examples: **beclometasone, budesonide, fluticasone**

**D- The Holding chamber** makes it possible to take in the medication more *slowly* than is possible. (Since the **medication is temporarily suspended in the holding chamber, the timing of the inhalation is not nearly as critical**). There are special holding chambers for younger children that has a mask.

### Further reading

#### Investigations of respiratory function <sup>(1)</sup>

**1-The forced expiratory volume (FEV1) and forced vital capacity (FVC)** which are measured by spirometer .

**FEV1** : where the patient inhales as deeply as possible and then exhales forcefully and completely into a mouthpiece connected to a spirometer. The FEV1 is a measure of forced expiratory volume in the first second of Exhalation .

**FVC** : the maximum volume of air exhaled with maximum effort after maximum inspiration.

The FEV1, is usually expressed as a percentage of the **FEV1/FVC ratio**. Normal individuals can exhale at least 75% of their total capacity in 1 second. Any reduction indicates deterioration in lung performance.

**2- Peak expiratory flow rate (PEFR)** it is the maximum flow rate that can be forced during expiration. It is measured by peak flow meter.

#### Differences Between asthma and COPD

Table 1 : clinical feature differentiating asthma and COPD <sup>(2)</sup>		
	<b>COPD</b>	<b>Asthma</b>
<b>Smoking</b>	Most	Possibly
<b>Symptoms under age 35 years</b>	Rare	common
<b>Chronic productive cough</b>	Common	uncommon
<b>Waking at night with breathlessness or wheeze</b>	uncommon	Common
<b>Significant diurnal or day-to-day variability in symptoms</b>	uncommon	Common
<b>FEV1 and FEV1/FVC ratio return to normal with drug therapy</b>	Never with significant disease	Probably

#### References :

1- Roger.Walker. clinical pharmacy and therapeutics. 2007.

2- A.Ballinger , S.Patchett. Kumar and Clark :pocket essential of clinical medicine . 4th edition.2008