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## KNOW HOW Asthma inhalers

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This guide explains how different types of inhaler devices work, and describes their benefits and drawbacks. Inhalation is the generally preferred method of delivery of medication for treating asthma. The drug is delivered directly to the airways, so it can act more quickly and smaller doses can be used. The pressurised metered-dose inhaler (MDI), developed in 1956, is still the most widely prescribed inhaler device in the UK and is used by over 75% of patients. Because of the need to coordinate actuation with inspiration the patient needs careful instruction to ensure correct use. Following the signing of the Montreal Protocol (Rowlands, 1993) on reducing the use of chlorofluorocarbons worldwide, MDIs containing CFCs are being replaced with CFC-free inhalers (hydrofluoroalkane devices). Most HFA MDIs have a one-to-one equivalence with their CFC-containing counterparts and can be replaced dose for dose. Where such an HFA is not available, dose adjustments will be necessary. Research shows that over 50% of patients do not use metered-dose inhalers correctly (Hilton, 1990). Of those whose technique is correct, many are likely to forget it without reinstruction (Crompton, 1982) and may forget to use it correctly under stress (Lindgren et al, 1987). Health professionals, too, may have problems with inhaler devices (Cooper et al, 1992) and so may need training to teach patients correct inhaler technique. A patient's use of their inhaler device should be checked at every consultation, as inappropriate device selection or inadequate training can result in inefficient drug delivery and treatment failure (Lenney et al, 2000). The National Asthma and Respiratory Training Centre recognises the importance of device selection and has issued advice on correct use and points to consider when selecting an inhaler device (Barnes et al, 1997) (Box 1). A patient's abilities and attitudes to asthma therapy will affect their use of the device, so this should be considered when selecting one.

### Colour coding of devices

In many cases, drug classes will be identified by the colour of the inhaler. The colour-coding is as follows: - Blue: short-acting b2 agonist ('reliever'); - Brown/orange/burgundy: corticosteroid ('preventer'); - Green: long-acting b2 agonist; - Purple: long-acting b2 agonist/corticosteroid combination.

### Types of inhaler

Inhaler devices can be broadly categorised into three types: pressurised metered-dose inhalers,

dry-powder inhalers, and nebulisers. Metered-dose inhalers (MDIs) can be subdivided into unadapted and adapted devices, spacer devices, and breath-actuated devices. Dry-powder inhalers can be single-dose devices or multiple-dose devices. Multiple-dose devices contain the medication either in a drug reservoir or as individually sealed doses. The latter, because of the way they are manufactured, have greater through-life dose consistency (Malton et al, 1995). Nebulisers can be compressor-driven and ultrasonic. Details of how the different types of inhaler work and how to use them, as well as their pros and cons, are given overleaf.

### Device selection

**In-Check Dial** This device is an important teaching aid. It can be used not only to assess a patient's ability to use a device but also their inhaler technique (Nsour et al, 1999). A sleeve on the barrel can be rotated to apply different resistances to simulate the inspiratory flow resistance of different inhaler devices. The scale represents inspiratory flow in litres per minute and is marked to indicate optimal flows for various devices. Breath-actuated and dry-powder devices have different inherent internal resistances. A patient's ability to achieve optimal inspiratory flow rate through a specific device will vary, depending on their inhalation technique, age and level of asthma control. Use of this device can ensure the selection of an appropriate inhaler for each patient. **Aerosol inhalation meter** The aerosol inhalation meter is a useful training aid. It is an electronic device that uses a dummy MDI to measure coordination of actuation and inspiration, rate of inspiration and breath-holding. **Turbobaler trainer** This is an electronic device that uses a dummy Turbobaler to measure inspiratory flow.

### Teaching

Jargon should be avoided and language the patient will easily understand should be used (Box 2). During a consultation nurses should take the opportunity to repeat instructions and check the patient's understanding and technique. **Protocols and device technique** There should be an agreed device check protocol to ensure all members of the health care team are giving the same message. A scoring system for device technique should be drawn up to ensure that each team member is following the same guidelines and technique-checking parameters. Patient device technique should be recorded at each visit.

### Acceptability

Acceptance of the device by the patient is critical to successful use. If a patient has problems learning to use one device, it is worth trying a different one. In children and adolescents, peer pressure will affect acceptance of a device. When selecting devices for use by small children, it is important to involve the child and parent. In adults, a device's acceptability may depend on convenience and whether it is seen as a nuisance. In older people, their mental and physical capabilities may affect their ability to learn to use a device.

### Best practice

Regular and frequent checks of technique are essential to facilitating patient acceptance and their understanding of how to use the device. Choosing a device the patient finds easy to use should enhance care, as it will reduce the time needed for instruction and to check their technique in using it, thus helping reduce pressure on asthma clinics. The health professional's role in matching the device to the patient is critical and the patient must have a key role in the choice. A device that fits in with their needs will increase the chances of their using it correctly. Therapy for asthma is frequently adjusted because symptoms remain unchanged or become worse. Before any change in dose or therapy class is considered, inhaler technique should be reviewed in case

the patient is not using the device correctly. Good communication between the patient and health care team is vital to successful asthma management. It should involve history-taking, discussion of the condition, an understanding of the patient's attitude to asthma and its management, and insight into the patient's lifestyle.