Diagnosis, monitoring and management of chronic asthma

STEVE CHAPLIN

In November 2017, NICE published a new guideline on the diagnosis and management of chronic asthma (NG80). This article provides an overview of the guidance, and how it differs from the 2016 joint British Thoracic Society/SIGN guideline.

The 1999 joint British Thoracic Society/SIGN guideline on the management of asthma was among the first and the most successful of the evidence-based clinical guidelines that have become a feature of the modern NHS. The current version, published in 2016, contains updates to most sections and includes links to the 2013 NICE quality standard. Quite why NICE decided to develop its own clinical guideline on asthma rather than pool resources is therefore a mystery but, after five years’ work involving some of the same specialists (and many of the same centres) who authored the BTS/SIGN document, that is what clinicians in England and Wales should now use to guide their management of chronic asthma.

The BTS/SIGN guideline has the broader focus, covering chronic, acute, difficult and occupational asthma, as well as asthma in pregnancy, while NICE confines its coverage to chronic asthma. Both include diagnosis, monitoring and treatment in children, young people and adults, and helpfully summarise their recommendations as algorithms. Whereas the BTS/SIGN document presents a readable summary of the evidence as it goes along, NICE’s style is the familiar directive approach, providing supporting evidence and elaboration as separate online documents.

Diagnosis

The diagnosis of asthma is made on clinical grounds supported by objective measures of lung function. For many years, spirometry and bronchodilator reversibility have been the gold standard tests, complemented by peak flow measurement and provocation tests when needed (though children under five years old are unable to perform these tests and their diagnosis remains clinical).

NICE now also recommends measurement of fractional exhaled nitric oxide (FeNO), a biomarker of airways inflammation. As NICE explains: “Exhaled nitric oxide mainly originates from the respiratory epithelium and is produced by inducible NO synthase (iNOS). In people with asthma, iNOS expression is upregulated by interleukin-4 and -13, both archetypal Th2 cytokines. Thus exhaled nitric oxide primarily signals Th2-lymphocyte-driven inflammation in the bronchial mucosa..."
and consequently has potential utility in the diagnosis of asthma.\(^3\)

FeNO is recommended for those aged over 17 years if a diagnosis of asthma is being considered; a level of ≥40 parts per billion (ppb) is positive. In 5–16-year-olds, FeNO should be considered if there is diagnostic uncertainty after initial assessment and they have either normal spirometry or obstructive spirometry with negative bronchodilator reversibility; a level of ≥35 ppb is positive.

FeNO measurement takes 10 minutes and is easier for patients to perform than spirometry. One recent analysis concluded that the test offers 82% specificity and 65% sensitivity.\(^4\) However, while GPs have been using spirometers for some time, few have the means to measure FeNO (although it has been successfully piloted in primary care). NICE therefore qualifies its recommendation by adding “if the equipment is available”. Describing FeNO measurement as “a significant enhancement to current practice”, NICE acknowledges it will take time for the NHS to provide equipment and training, and raises the possibility of focusing resources in diagnostic hubs. In the meantime, GPs should do what they can with the resources they’ve got.\(^5\)

### Drug treatment

The second major area of divergence between NICE and BTS/SIGN concerns the early escalation of drug treatment. Both guidelines recommend beginning with as-required use of an inhaled short-acting beta-agonist bronchodilator (SABA) in those with infrequent short-lived wheeze. If symptoms occur three times or more per week or cause waking at night, or if asthma is uncontrolled using a SABA alone, regular use of a low-dose inhaled corticosteroid should be offered as first-line maintenance therapy. If additional treatment is needed, BTS/SIGN then recommends an inhaled long-acting beta-agonist (LABA) for adults and either a LABA or an oral leukotriene-receptor antagonist (LTRA) for children over five years. However, in its new guidance, NICE now opts to add an LTRA to the inhaled corticosteroid at this step, rather than a LABA, for everyone from the under-5s to adults (see Figure 1).

![Figure 1. Pharmacological treatment of chronic asthma in adults aged 17 and over. From: NICE. Asthma: diagnosis, monitoring and chronic asthma management. NG80. November 2017\(^1\)](prescriber.co.uk)

**Abbreviations:**
- ICS = inhaled corticosteroid
- LABA = long-acting beta-agonist
- LTRA = leukotriene receptor antagonist
- MART = maintenance and reliever therapy
- SABA = short-acting beta-agonist
1 for the recommended treatment algorithm in adults).

NICE says the main advantage of choosing a LABA at this step is a possible reduction in the number of exacerbations compared with an LTRA. But this does not reduce hospital admissions for exacerbations and what evidence there is for an improvement in quality of life suggests any gain is small in relation to the additional cost. Overall, an inhaled corticosteroid plus an LTRA is more cost effective. However, patients who are happy using an inhaled corticosteroid and a LABA should continue doing so.

The next step for NICE is, for the over-5s, young people and adults, adding a LABA; patients should consider whether to continue the LTRA, taking into account their response to it. Both BTS/SIGN and NICE note that patients whose asthma is not controlled by the time they reach this step may benefit from adding theophylline or tiotropium. Under-5s whose asthma has not been controlled by an inhaled corticosteroid and an LTRA should be referred.

NICE adds that patients should be empowered within a self-management plan to temporarily increase their dose of inhaled corticosteroid over a week when asthma control deteriorates. A reduction in the maintenance dose should be considered when asthma has been controlled for at least three months.

Summary
The new NICE guideline on asthma has much in common with the familiar BTS/SIGN document but there are two major differences. NICE believes FeNO measurement should improve the accuracy of asthma diagnosis; however, it will take time to implement and, initially at least, might lead to a shift in asthma diagnosis away from the GP’s surgery to new diagnostic hubs. Switching from recommending a LABA to an LTRA as initial add-on therapy to an inhaled corticosteroid overturns years of clinical practice and reintroduces oral therapy for many patients.

References
2. National Institute for Health and Care Excellence. *Asthma: diagnosis, monitoring and chronic asthma management*. NG80. November 2017. Available from: https://www.nice.org.uk/guidance/ng80. NICE guidance is prepared for the NHS in England and is subject to regular review and may be updated or withdrawn. NICE has not checked the use of its content in this article to confirm that it accurately reflects the NICE publication from which it is taken.

Declaration of interests
None to declare.

Steve Chaplin is a medical writer specialising in therapeutics.