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**PROGRAMME: MSC PUBLIC HEALTH
AND SOCIAL CARE IN PRACTICE**

**MODULE: COMMUNITY CARE AND
MANAGEMENT OF LONGER-TERM
CONDITIONS**

MODULE CODE: LCHS7003

**ASSIGNMENT TITLE: COMPONENT 1
INFORMATION BOOKLET OF LONG-
TERM CONDITION MANAGEMENT**

TOPIC-ASTHMA

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DEADLINE- 14 NOVEMBER, 2025 (2PM)

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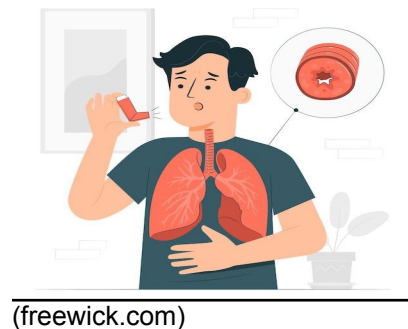
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1.INTRODUCTION

ASTHMA



Asthma is a condition that doesn't simply come and go; it lingers, often shadowing individuals for their entire lives. As a chronic illness, asthma is defined by the persistent inflammation and extreme sensitivity of the airways within the lungs. This underlying inflammation means that the airways are always on high alert, ready to react—sometimes with little provocation. When a trigger sets things in motion, the airways can swell, the muscles around them tighten, and excess mucus floods in, narrowing the passages and making each breath a conscious effort. For people living with asthma, this can mean a spectrum of

experiences: on some days, it's a nagging cough that refuses to subside, an occasional wheeze, or a sensation of tightness weighing down the chest. On other days, it can escalate quickly into a full-blown emergency, where the struggle for air becomes acute and frightening, requiring rapid medical intervention.

In the United Kingdom alone, asthma's reach is significant. Approximately 5.4 million people are currently receiving active treatment for the condition—a figure that includes one in every twelve adults and one in every eleven children, as noted by

Asthma + Lung UK in 2024. While advances in medical science have led to a broader array of treatment options ranging from inhalers and steroids to newer biologic therapies, these improvements have not translated into universal safety or wellness. Tragically, preventable deaths and unplanned hospitalizations still occur with alarming regularity. Much of this stems from a gap between what best practice guidelines recommend and what happens in everyday healthcare. Not everyone receives optimal or consistent care, which can be influenced by factors such as access to medical services, socioeconomic

status, and even awareness of the latest treatment protocols. According to the National Institute for Health and Care Excellence (NICE) in 2021, this disparity continues to cost lives and places a heavy burden on individuals and families dealing with asthma.

The long-term management of asthma needs continuous monitoring, self-management education and policy integration across the National Health Services (NHS). The economic burden is considerable: Direct costs exceed £1 billion annually and indirect losses reach £3

billion (NHS England, 2024). Addressing asthma hence supports both clinical outcomes and socioeconomic sustainability goals within the NHS Long Term Plan (2019).

2.DEFINITION,

EPIDEMIOLOGY AND

AETIOLOGY

2.1 DEFINITION

The British Thoracic Society and Scottish Intercollegiate Guidelines Network (BTS/SIGN 2019) define asthma as a

chronic inflammatory disease of the airways characterised by variable airflow limitation and bronchial hyper-responsiveness and underlying swelling.

Pathophysiologically, the airway narrowing results from smooth-muscle contraction, mucosal oedema and mucus overproduction, which causes recurrent wheeze, cough and breathlessness.

2.2 EPIDEMIOLOGY

Overall asthma prevalence continues to rise, particularly in urban environments with high pollution exposure (WHO, 2023).]

In the UK, hospital-admission rates are highest among children and deprived communities (GOV.UK, 2024). Four people die each day from asthma-related causes, and 160,000 individuals experience life-threatening attacks annually (Asthma + Lung UK, 2024). Ethnic disparities persist owing to housing and access inequalities (NICE, 2021). The prevalence is highest in children and young adults, but no age is exempt, and late-onset asthma is increasingly recognized, especially among women.

2.3 AETIOLOGY AND RISK FACTORS

Asthma is a multifactorial disease, where the origin combines genetic predisposition with environmental exposure. Early - life infections, allergen sensitisation, passive smoke, obesity and occupational irritants are key factors. Heritability estimates range from 35 to 95 percent, displaying strong genetic component (Harrington,2020). Environmental triggers such as viral infections, allergens, air pollution, smoke, and occupational irritants contribute to disease onset and exacerbation.

Recent evidence links vitamin-D deficiency, poor diet and obesity to increased incidence, while social determinants such as damp housing and fuel poverty exacerbate prevalence (My Health Devon, 2024). This complicated interaction emphasises the need for mixed prevention and management strategies that outrun pharmacological control.

3. IMPACT OF ASTHMA ON INDIVIDUALS AND FAMILIES

Asthma brings into play physical, psychological, social and economic effects that extend beyond symptom control. The physical ramifications of asthma are intimately connected to psychological well-being and family. Repeated bronchoconstriction limits exercise, disrupts sleep and causes daytime fatigue (NICE, 2021).

Psychologically, patients often report anxiety and panic attacks, particularly nocturnal episodes (Beat Asthma, 2024). Dependence on reliever medication and uncertainty about triggers reduce quality of life. Children with uncontrolled asthma miss school, affecting learning and socialisation (Asthma + Lung UK, 2024). Adults experience absenteeism and reduced productivity (My Health Devon, 2024). Carers face emotional strain and financial pressure (ProQuest Article, 2021). Socioeconomic disadvantage raises the impact, as poor housing and limited access

to green space correspond with worse outcomes (GOV.UK, 2024). At the population level, the cost of asthma in the UK healthcare is billions and lost productivity (NHS England, 2024). For that reason, operative asthma management must address clinical but also social and environmental determinants of health.

4. EVIDENCE BASED MANAGEMENT AND TREATMENT IN THE UK

4.1 PHARMACOLOGICAL MANAGEMENT

The management of asthma care within the NHS is followed by evidence-based guidelines such as NICE NG80 (2021) and BTS/SIGN (2019) to achieve control with the lowest effective dose. The comprehensive objective is to attain

symptom control, put a stop to exacerbations, and reduce adverse consequences using lowest effective medication dose.

Short-acting β_2 -agonists (SABAs) provide immediate relief but should not be over-used. Inhaled corticosteroids (ICS) remain the foundation of therapy, decreasing airway inflammation and hospital admissions (Asthma + Lung UK, 2024). For patients with persistent asthma, LABA/ICS combinations are prescribed to improve lung function and symptom stability. Leukotriene receptor antagonists

and theophylline may be used as addition therapies in particular cases (BTS/SIGN, 2019).

Patients with severe disease or treatment-resistant asthma, may receive biologic therapies such as omalizumab, mepolizumab or benralizumab targeting specific inflammatory pathways (NHS, 2023). The backbone of asthma management is inhaled corticosteroids, which reduce airway inflammation and the risk of exacerbations.

4.2 NON-PHARMACOLOGICAL MANAGEMENT

Non-pharmacological measures are equally vital. Non-Pharmacological Interventions advice includes avoidance of identified triggers. Environmental control, smoking cessation and vaccination remain vital. Avoidance of known triggers, smoking cessation, vaccination against influenza and COVID-19, and physical conditioning are core components of management.

Education about correct inhaler technique is vital, studies indicate that up to 70

percent of patients make inhaler errors that compromise drug delivery (NICE, 2021). Personalised Asthma Action Plans (AAPs), which involve guidance on symptom recognition and expansion, have been shown to lower emergency admissions by up to 40 percent (Asthma + Lung UK, 2024).

5. SELF-MANAGEMENT AND DIGITAL SUPPORT

Self-management empowers patients through observing and shared decision-making supported by digital tools (NHS England, 2019). The NHS Long Term Plan (2019) uplifts digital self-management tools and remote monitoring for patients with asthma. Mobile applications now permit real-time recording of symptoms and medication use, equipping clinicians to alter treatment proactively.

Digital innovation offers one mechanism to mitigate these disparities. The NHS Digital Transformation Directorate (2024) reports that over one-third of asthma patients now use mobile applications supported by community training and alternative access routes such as telephone triage or pharmacist-led reviews. Multidisciplinary collaboration is another cornerstone of effective asthma management. Research by Patel et al. (2022) demonstrates that integrated respiratory teams, investment in interoperable data platforms and protected inter-professional time is necessary to translate theoretical collaboration into

sustainable practice.

Online communities and teleconsultations strengthen self-efficacy and decrease isolation (ProQuest Article,2021). Combining asthma nurses and pharmacists into care pathways has also been shown to improve adherence and reduce emergency-department utilisation (Levy,2023). Partnership among general practitioners, respiratory specialists, and community pharmacists is therefore key to provide uninterrupted, patient-centred care. Overall, the purpose is to bring AI, digital health apps and integrated

respiratory teams tying into NHS ICS policy.

6. THEORETICAL

MODELS AND

FRAMEWORKS

The management of asthma as a long-term condition can be assessed through both national and international theoretical frameworks that highlight prevention, self-management, and system integration. The two primary models applicable to UK practice are the NHS Long Term Plan

(2019) and the WHO Chronic Care Model (CCM).

6.1 The NHS Long Term Plan (2019)

The NHS Long Term Plan constitutes the central framework for improving long-term-condition management, including asthma. It emphasises prevention, early diagnosis, and integrated respiratory care delivered through primary-care networks and Integrated Care Systems (ICS). By enlarging community respiratory teams and enhancing digital self-management

tools, the plan aims to prevent 80,000 hospital admissions for asthma and chronic obstructive pulmonary disease (COPD) over a decade.

It also emphasizes the significance of reducing health inequalities by targeting high-risk, socioeconomically impoverished populations. The plan's principles—personalised care, digital innovation, and workforce development—reflect a modern public-health approach that combines clinical and social care.

6.2 The WHO Chronic Care Model (2023)

The WHO Chronic Care Model (2023) provides an extensive international framework for chronic-disease management. It outlines six key elements: health-system organisation, self-management support, decision support, delivery-system design, clinical information systems, and community resources.

The model encourages proactive, patient-centred care that empowers individuals to manage their own conditions while

securing that healthcare systems are structured to support long-term engagement. Applied to asthma, this model encourages multidisciplinary collaboration, community education, and data-driven decision-making.

6.3 COMPARISON OF MODELS

Comparing national and international theoretical frameworks further illuminates system strengths and gaps. Comparatively, the NHS Long Term Plan interprets the theoretical elements of the WHO model into a practical, national execution strategy.

Both frameworks emphasise prevention, patient empowerment, and integrated services, though the WHO model offers a more universally adaptable structure. Combining these models allows the UK to achieve a whole-systems approach that links national health policy with local-level service delivery. Together, they uplift evidence-based interventions that address clinical, social, and environmental determinants of health.

7.NATIONAL AND LOCAL POLICY INFLUENCES

National and local policy frameworks play a pivotal role in shaping asthma services within the United Kingdom. It determines how asthma services are designed, funded and delivered in the United Kingdom.

At the national level, NICE NG80 (2021) regulates diagnosis, pharmacological management and review intervals to ensure consistency of practice across the

NHS. The NHS Long Term Plan (2019) reinforces these guidelines for early detection, digital innovation and community-based respiratory networks that aim to reduce hospital admissions. Environmental policy also intersects with asthma management.

The Clean Air Strategy (2019 – 2024) tackles environmental triggers by limiting industrial pollutions and upgrading active-travel initiatives (GOV.UK, 2024). These policies reflect a whole-government appeal linking public-health and environmental protection. Locally, Integrated Care Boards

(ICBs) commission respiratory services and coordinate community asthma teams, school-based education and smoking-cessation programmes (My Health Devon, 2024). Local authorities partnership with environmental-health and housing associations to improve indoor-air quality and reduce damp housing. Despite comprehensive frameworks, disparities persist in funding, labour force capacity and service accessibility between regions.

Urban centres may have specialist asthma nurses and outreach clinics, whereas rural areas depend heavily on primary care.

Successful execution therefore depends on targeted investment, monitoring and unbiased resource distribution.

8. CRITICAL EVALUATION AND POLICY REFLECTION

Despite clear advances in asthma care, translating evidence-based policy into consistent clinical outcomes remains challenging. Implementation studies reveal a persistent “policy–practice gap,” whereby national strategies such as the NHS Long

Term Plan (2019) are not fully operationalised at primary-care level (House of Commons Health and Social Care Committee, 2023). Local commissioners often struggle with competing priorities, workforce shortages and budgetary constraints, which limit their capacity to deliver sustained respiratory programmes. According to the King’s Fund (2024), uneven adoption of digital and community-based models has resulted in postcode variation in asthma outcomes. These discrepancies illustrate the importance of implementation science and continuous evaluation within health-policy

cycles.

Another limitation lies in the fragmented nature of public-health collaboration. While Integrated Care Systems were designed to bridge gaps between primary, secondary and social care, early evaluations suggest that data sharing and governance structures remain inconsistent (Patel et al., 2022). Strengthening these systems through unified digital platforms and standardised outcome metrics would facilitate real-time learning and quality improvement. Furthermore, a stronger interface between environmental policy

and healthcare commissioning is vital. Air-quality interventions—such as low-emission zones and housing-ventilation schemes—should be embedded as core components of respiratory-disease prevention (DEFRA, 2024).

Finally, future research should prioritise participatory approaches involving patients, carers and community organisations in service design. This aligns with the co-production ethos promoted by the NHS People Plan (2023), ensuring that reforms reflect lived experience and cultural diversity. By embedding

participatory governance, evidence-based evaluation and ecological accountability into future respiratory strategies, the NHS can move beyond policy aspiration toward measurable, equitable improvement in asthma outcomes across the United Kingdom.

9. HEALTH

INEQUALITIES AND

SOCIAL

DETERMINANTS OF

ASTHMA IN THE UK

Asthma management in the United Kingdom continues to exemplify both the strengths and weaknesses of chronic-disease governance within a high-income health system. While the NHS provides universal access and comprehensive clinical guidance, outcomes remain uneven across regions and population groups. ... Consequently, a critical approach to

asthma management must transcend biomedical optimisation to include social-policy reform and environmental justice.

A crucial dimension of this inequity is ethnicity. Recent evidence demonstrates that people of Black and South-Asian heritage experience poorer asthma control, later diagnosis, and lower participation in self-management programmes (Caballero et al., 2023), ensuring universal provision but with intensity proportional to need (Marmot Review, 2020).

10.RECOMMENDATION **FOR IMPROVEMENT**

Improving asthma consequences requires a person-centred, multi-sectoral plan of action that combines clinical excellence with social and environmental action. Yearly asthma rating and inhaler-technique checks should be compulsory constituents of primary-care quality frameworks (NICE, 2021). Education must be comprehensive and culturally applicable, delivered in multiple languages enabling patients to make informed decisions. Targeted

interventions are required to reduce inequalities that affect deprived and minority communities, low-income households, residents of high pollution areas (GOV.UK, 2024). Public health-promotion campaigns in schools, workplaces and community centres in multiple languages could raise awareness and engagement in high-risk groups. Professional development is equally vital.

Continuous training for clinicians, nurses, and pharmacists ensures that they remain up to date with new pharmacological and digital approaches (BTS, 2019). Nurses

and pharmacists should be empowered to deliver independent prescribing under protocol and remote reviews, expanding workforce capacity. Collaborative communication platforms linking patients, general practitioners and specialists will facilitate real-time data sharing and earlier intervention. Digital transformation presents further opportunities. At the community level, schools and workplaces should implement asthma-friendly policies such as access to emergency inhalers and staff awareness training (Gonzalez-Moral et al., 2025). Public-health bodies should expand telemedicine for remote

populations, reducing travel costs and improving continuity of care. Public-health campaigns focusing on air quality, smoking cessation and physical activity should be harmonised with national respiratory-disease strategies to ensure maximum impact.

Cross-sector collaboration is essential. Effective asthma management cannot be gained through healthcare services alone, it requires joint efforts from housing improvements, education, transport, urban green spaces and pollution reduction. This

can generate lasting improvements in asthma control.

11. ETHICAL

DIMENSION AND END

OF LIFE

CONSIDERATIONS

Person-centred care remains central to long-term-condition management. Shared decision-making fosters autonomy and adherence. Training clinicians in motivational interviewing and culturally

competent communication could therefore enhance outcomes while aligning practice with NHS quality-improvement objectives. Ethical considerations underpin these interactions. Respect for autonomy requires that patients receive understandable, balanced information, expanding outreach clinics could reduce such inequities.

Although asthma rarely necessitates end-of-life care, ethical reflection on anticipatory planning remains relevant. Recognising when to shift focus from escalation to

comfort reflects the maturity of a truly person-centred system.

12.FUTURE DIRECTIONS

Emerging advances in precision medicine and genomics will reshape asthma management over the coming decade, by identifying biomarkers that predict treatment response, enabling therapies tailored to individual inflammatory pathways (Agusti et al., 2021). For instance, patients with eosinophilic

inflammation respond better to anti-interleukin-5 biologics, while those with allergic phenotypes benefit from IgE-targeted treatment.

Genetic profiling can identify responders to biologics, enhancing effectiveness and cost-effectiveness. Artificial-intelligence systems are being combined into electronic health records to foresee exacerbation risk using real-time environmental, clinical and behavioural data (Drummond, 2024). These technologies line up with the NHS Long Term Plan's ambition for digitally enabled, preventive care.

Sustainability is a side by side priority. The NHS has committed to achieve net-zero carbon emissions by 2040, and asthma care must support this through greener inhaler options and reduced waste (Onasanya et al., 2025). Transitioning from pressurised-metered-dose inhalers to dry-powder devices could significantly cut emissions. Pharmaceutical companies are investing in greener production processes and recyclable materials and carbon-neutral manufacturing. Patient education regarding environmentally responsible inhaler disposal can further reduce impact.

Future care will also rely on stronger community partnerships. Charitable organisations such as Asthma + Lung UK are expected to play a growing role in patient and peer support, advocacy and public-awareness campaigns. Combining clinical innovation with social engagement will ensure that progress in technology translates into tangible improvements in population health.

Collaborative projects between the NHS and voluntary sector can improve access to self-management resources and provide peer mentorship for newly diagnosed

individuals. Integrating social prescribing into respiratory pathways could also help address the psychosocial determinants of asthma by linking patients to community activities, exercise programmes, and mental-health support.

In summary, this extended discussion reinforces that effective asthma management in the UK requires more than adherence to clinical guidelines. By uniting evidence-based medicine with equity-driven policy, the UK can continue progressing toward a sustainable, person-

centred respiratory-care system that improves both health and social wellbeing.

13. CONCLUSION

Asthma remains as a leading public-health and socioeconomic challenge in the United Kingdom. Despite advances in treatment and guideline development have improved control for many patients, health inequalities and inconsistent application continue to limit progress. The condition imposes a multifaceted burden encircling physical symptoms, psychological distress and financial cost.

Evidence-based frameworks guided by NICE NG80 (2021) and BTS/SIGN (2019) provides a strong framework for clinical guidance, while national strategies like the NHS Long Term Plan (2019) embeds prevention, digital innovation and integrated care across the health system. nonetheless, inconsistent implementation and persistent health inequalities limit the realisation of these benefits. Sustained investment in education, workforce development and equitable service provision is essential to reduce preventable morbidity and mortality and environmental improvement. Future policy must continue

to integrate environmental and social determinants into asthma planning. Effective asthma management depends on coordination among clinicians, policymakers, patients, and communities. Addressing extensive factors such as air quality, housing, and socioeconomic status is critical to long-term success. Aligning UK strategy with national initiatives with international models such as the WHO Chronic Care Model will ensure consistency between local practice and worldwide quality. As health practices head

for sustainability and digital conversion, asthma care must develop accordingly.

Finally, promoting environmentally friendly healthcare will secure long-term viability for respiratory services. By combining evidence-based medicine, patient empowerment and interdisciplinary collaboration, the UK can achieve significant reductions in asthma morbidity, prevent avoidable deaths and improve quality of life for millions of citizens with this chronic conditions.

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