



# DIGITAL ASTHMA:

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RE-IMAGINING PRIMARY CARE

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We work to stop asthma attacks and, ultimately, cure asthma by funding world-leading research and scientists, campaigning for change and supporting people with asthma to reduce their risk of a potentially life-threatening asthma attack.

*“PCRS welcomes this report from Asthma UK which illustrates how we can use digital technologies and data in a more effective way to offer personalised, more targeted care to people with asthma. In recent times many of us will have had to move to more digital consultations. This report gives wider consideration to how clinicians and patients can take that further together into the future.”*

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## Foreword

This year, 2020, is shaping up to be a year like no other. We are currently living in unprecedented times with COVID-19 having a profound effect on the way the NHS is required to provide services to people with asthma.

The NHS has been on a quiet but clearly projected digital journey over the past 12-18 months. This is illustrated by the establishment of NHSX and the commitments made within the NHS Long-Term Plan. These laid out ambitions such as patients having the right to a digital-first offer when accessing primary care by March 2024. There is now a powerful spotlight on this activity, which is accelerating in response to COVID-19.

The need to find new digital solutions for people with asthma has never been as important than right now. Asthma UK, through reports like this, are seeking to examine the latest digital commitments made by the NHS, and actively bring together how these national commitments translate to the improvement in local asthma services within primary care. How well people with asthma can access these digital solutions throughout the COVID-19 crisis and beyond will be a litmus test for how well the NHS manages to design and roll out digital support across the board. We need to make the most of the current emphasis on digital services and how it can work towards reducing health inequality by providing people with asthma with more options when accessing NHS services.

Asthma is a condition with multiple triggers and varying symptoms, managed by a variety of different NHS providers. Just as there is no one 'type' of asthma, there is no one-size-fits-all pathway. Good management requires detailed understanding for both health care professionals and people with asthma about potential triggers, current environment, history of attacks and prescribed medications.

To offer a safe and effective digital service, all of this information needs to be accessible to the patient themselves and to anyone who needs it in order to provide appropriate care. Bringing all this information together to deliver great care isn't easy, particularly when systems are not properly integrated. Tragically, we have seen asthma deaths as a result. Tamara Mills was just 13 years old when she tragically died from an asthma attack. She had sought help for her asthma in the years leading up to her death 47 times. Despite her frequent attendance to both GP appointments and hospital, no one identified her as a high-risk patient. Her death was directly attributed to a lack of data sharing between healthcare services, resulting in potentially life-threatening warning signs not being identified and acted upon. It is cases like this that perfectly illustrate the need to transform how asthma is monitored and managed, particularly within primary care.

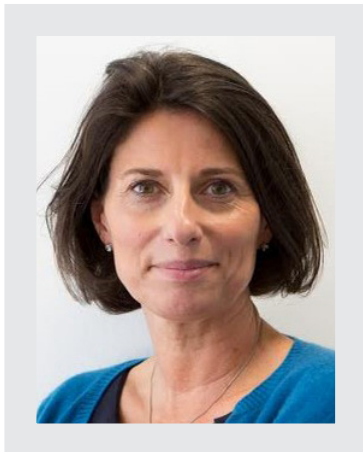
Asthma UK has produced a series of reports – *Connected Asthma*<sup>1</sup>, *Smart Asthma*<sup>2</sup>, and *Data sharing and Technology*<sup>3</sup> – exploring the potential for technology to address challenges facing asthma treatment today. The first report in 2015 highlighted how much basic infrastructure was still needed in the NHS to enable the greater use of digital. Since then, we have seen some digital transformation in the NHS, but leveraging this for asthma has been slow and patchy to date. Given the size and nature of the asthma population, the unmet need, and the strength of the evidence for asthma self-management, asthma is a compelling case for investment in technology-enabled asthma management.

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This report is designed to show what can be done right now in systems, highlighted by specific case studies and how they could be scaled across primary care throughout the UK. We know the majority of people with asthma are positive about digital technologies – we want to encourage the NHS to move swiftly, spurred on by the pressing current need for social distancing, to use digital technology to improve basic asthma care and stop asthma attacks.

**Kay Boycott**

Chief Executive, Asthma UK



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# Introduction

## Asthma unmet need

Asthma is a unique and highly prevalent condition with a significant call on NHS resources. This burden is largely felt in primary care where 85% of people with asthma are solely managed, and where most routine and acute care of asthma happens.<sup>4</sup>

Asthma is unique in that it can present in numerous ways, often with unpredictable triggers including viruses, poor air quality and allergies. Added to this are patient factors including a poor understanding of asthma and its management, and negative asthma-related health behaviours such as smoking and poor adherence to preventative medication, both of which are common throughout UK asthma populations.

Every year the Asthma UK annual survey provides a snapshot of asthma basic care across the UK. There are things to celebrate – notably an increase in the number of people with asthma action plans – but overall there has been little improvement since the 2014 National Review of Asthma Deaths (NRAD)<sup>5</sup>. This ground-breaking review shockingly revealed the inadequacy of basic care – concluding that two-thirds of asthma deaths could be prevented if basic care improved.

The UK has one of the worst asthma death rates in Europe, with deaths having increased by more than 33% in the last decade.<sup>6</sup> The winter months in the UK present the largest challenge for the NHS with 81% of people with asthma stating that their asthma is triggered by colds and flu.<sup>7</sup> The burden of asthma also goes beyond the immediate health effects of the individual, and the cost to the NHS, with the collective asthma population accruing approximately two million sick days off work and school because of their poorly controlled asthma or from having asthma attacks across a 12-month period.<sup>8</sup>

At the heart of basic asthma care is the annual asthma review. This review is seen as the cornerstone of effective asthma care, providing the necessary support for the patient to continue self-managing their condition throughout the year. However, the current ‘one size fits all’ approach is often based on an outdated asthma register that does not allow for any distinction on the basis of risk or disease control, or understand the patient motivation and behaviours that influence how they engage with their asthma. Care often revolves around the needs of the system and not the needs of the individual or the disease. This results in patients being invited to attend their review when their asthma is potentially well controlled, resulting in high non-attendance rates, poor outcomes and inefficient use of GP and nurse time.<sup>9</sup> It is clear that the current primary care model is not working effectively for all asthma populations. This is further highlighted with the current COVID-19 crisis, as poor data and lack of clarity around risk stratification has led to confusion when looking to shield certain asthma sub-populations.

The asthma population also has some unique characteristics. They are a younger cohort than most other long-term conditions. Work commissioned by Asthma UK highlighted that young people with lower socio-economic status and low educational attainment have poorer asthma-related health outcomes, and higher risk of asthma attacks.<sup>10</sup> Despite their lower health literacy levels, this group have higher digital literacy and are more likely to own a smartphone than other asthma sub-populations. This finding is further reinforced by a report produced in 2018 looking at the attitude of people with asthma to data sharing, with 93% of those surveyed willing to have their data collected through apps to highlight to their health care professional that their asthma needs to be reviewed.<sup>11</sup>

Greater use of digital care is likely to be an enabler for better engagement and support for hard-to-reach and high-risk groups such as

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these. Along with greater need for data sharing between patients and clinicians, is the need for highly personalised, supported self-care to enable people with asthma to manage such a variable condition. With the right education, treatment, monitoring and support, the NHS can help prevent asthma symptoms, asthma exacerbations and asthma deaths.

### **Changes in the Primary Care Landscape**

Primary care is undergoing monumental change, with commitments to digitise services being further accelerated by the current COVID-19 crisis. We know the current model needs to change as we see an increase in staff workloads, significant stresses on the NHS workforce and an ageing and more complex population to care for.<sup>12</sup> Timely access to healthcare, the quality of care, patient experience and the costs associated with healthcare delivery are all under severe pressure.

As part of the transition and modernisation of Primary Care there is a shift towards more self-care and responsibility for patients with long term conditions. We are also seeing greater roles for allied healthcare professionals and new roles being created within the workforce. Possibly the largest change is in the increasing importance of digital technologies to help the NHS to address issues of capacity and demand and to support better NHS care and improved patient self-care. In light of COVID-19, we have also seen how difficult it is to transition between different modes of care delivery within current care pathways.

Maximising the value of data and digital technologies currently sits firmly at the core of the NHS long-term agenda. It is seen as a central enabler to numerous initiatives contained within the NHS England Long Term Plan (LTP).<sup>13</sup> The recent creation of NHSX and the work of NHS Digital are both laying the system-wide foundations for secure, effective and useful technologies that can interact with each other. Dedicated resources are being directed towards Digital-First Primary Care to support practices to provide more digital

services.<sup>14</sup> Central to this agenda is the formation of Primary Care Networks (PCNs), with significant investment being provided to support PCN development and innovation across England.<sup>15</sup>

The five-year GP contract framework agreed in January 2019 was seen as the key vehicle to implementing commitments made by the NHS LTP. Recent extensions to that contract through the newly agreed Directed Enhanced Services (DES) between NHS England and the British Medical Association highlight how the government is serious about easing the pressure placed on primary care. Opportunities to leverage new funding through the GP contract and DES, put in place before the COVID-19 crisis to transform how a PCN delivers asthma care include:

1. Additional roles reimbursement scheme – This scheme looks to recruit an extra 20 000 staff by 2023/24 with NHS England reimbursing 100% of the new roles' salary costs. These new roles include physiotherapists, community paramedics, clinical pharmacists, social prescribing workers, dieticians and more. In real terms this means an additional 20 FTE staff for the average PCN by 2023/24.<sup>16</sup>
2. Online consultation funding – A GP online consultation fund was first launched in 2017, providing £15 million to CCGs to help support their plan to implement online consultations. In 2020/21 an additional £15 million per year has been allocated to Sustainable Transformation Partnerships (STP) to continue supporting NHS commitment to online consultations.<sup>17</sup> This funding along with additional funding for the Digital-First Primary care model is available via NHS England regional teams, with PCNs being encouraged to help decide how this funding can be best utilised.
3. NHS England has also established an NHS Digital Academy to develop new digital leaders to help drive the digital change required throughout the NHS.<sup>18</sup> This virtual academy offers a number

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of places for NHS staff to upskill their digital credentials. Placements are fully funded by NHS England and should be explored by PCN leadership teams to develop local staff capable of driving the digital agenda throughout the PCN. More information about the Digital Academy can be found **here**.

Within the devolved nations, Scotland, as part of the National Clinical Strategy for Scotland is putting the adoption of technological solutions at the heart of their primary care vision for the future.<sup>19</sup> Similarly, the new primary care model for Wales 'A Healthier Wales' is looking to explore digital solutions that benefit their local populations and embedding them within primary care.<sup>20</sup> There is great opportunity to think differently about how the NHS delivers care and supports patients using data and digital.

By digitising asthma services, the NHS can start to reap efficiencies for its workforce, make patient journeys faster and smoother and start to reduce the significant carbon footprint to which healthcare contributes. Reducing duplication and allowing patients to engage in healthcare-related activities remotely can make a big difference to reducing greenhouse gases. Transport is a big contributor to NHS emissions. The NHS accounts for almost 10bn road journeys each year – around 3.5% of all road travel.<sup>21</sup> If we can reduce the frequency of asthma patient visits to GP surgeries (2-3% all GP consultations) hospital appointments, we can not only cut down carbon emissions but can make life easier for many patients and the NHS staff who are supporting them.<sup>22</sup>

Novel approaches in digital technology have the potential to transform how care is delivered and received in the UK, and the opportunities it presents for people with asthma should not be ignored. With the adverse outcomes associated with asthma largely preventable through basic care provision within the primary care system, it should be seen as an exemplar condition to illustrate the value of digital tools and technologies in the NHS,

and their potential in transitioning the UK primary care system into the 21st century.

This report outlines how primary care can leverage the current enthusiasm and investment in digital technologies to transform how asthma is managed. Digital technology has the potential to improve outcomes, improve quality of care and lessen the environmental impact of asthma. It is important that primary care starts to embrace better use of data and digital and starts to put in place the infrastructure to support its growing presence throughout healthcare. Society will continue its march to becoming more digital and the NHS needs to keep pace.



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# Opportunities to leverage data and digital solutions to improve asthma care

## Increasing high-risk patient follow-up in primary care through improved data sharing across the NHS

While over 85% of people with asthma are solely managed in primary care, asthma attacks often require A&E or a general hospital admission.<sup>23</sup> This leads to the creation of two valuable data sets that often are not linked or shared across each setting. Lack of data sharing has been the catalyst for a number of high-profile asthma deaths, where asthma risk factors have not been identified and acted upon.<sup>24</sup> In situations where data is shared, it is often incomplete or delayed, reducing the value of the data to make more informed decision making.

The NICE Quality Statement for Asthma was updated in September 2018 and states, *'People who receive treatment in an emergency care setting for an asthma attack are followed up by their general practice within two working days of discharge'*.<sup>25</sup> This review is important as an opportunity to ensure not only that the patient is responding adequately to treatment but to also reinforce and optimise preventative treatments and behaviours at a *'teachable moment'*. But follow-up care is not provided to two thirds of all people with asthma discharged from hospital.<sup>26</sup> In many cases the primary care practice had not been informed in a timely manner or the responsibility for follow-up is left with the patient to arrange. While this is a significant issue, it forms part of a broader issue about the lack of data sharing between primary and secondary care.

While the NHS infrastructure is beginning to get the attention and funding it requires to allow for more progress to be made towards interoperable IT systems, more needs to be done.<sup>27</sup> Additionally, priority needs to be given to improving NHS culture, ensuring appropriate data security

### Tragic Case of Sophie Holman

Sophie Holman had sought help 48 times for her asthma in the years leading up to her death. She did not have an asthma action plan and, despite her frequent attendance to both GP appointments and hospital, no one identified her as a high-risk patient. Her death was directly attributed to a lack of data sharing between healthcare services, resulting in potentially life-threatening warning signs not being identified and acted upon.

measures are in place and NHS staff receiving the digital training required to enable better data sharing practices. Improved data sharing allows both clinicians within PCNs to better monitor their patient's risk factors within Integrated Care Systems (ICSs)/Sustainability Transformation Partnerships (STPs) to improve service planning through Population Health Management.<sup>28</sup>

A single electronic health record (EHR) can be the vehicle that captures all patient data across each care setting and should be readily accessible to both the person with asthma and clinician when required. Shared access to the EHR can facilitate effective sharing of information when the asthma patient is being seen in different settings from ambulance to acute care centre to hospital outpatient clinics.<sup>29</sup> It could flag the local GP when their patient is discharged from hospital ensuring a more efficient and streamlined follow-up process.

There is a lot of information within the EHR, including previous asthma reviews, missed appointments, medication history, number of preventer medications being prescribed, prescription of reliever inhalers and oral steroids/antibiotics. Written asthma action plans and results of tests including bloods, peak flow tests, spirometry and FeNO may be easily viewed

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where there is access to the EHRs.<sup>30</sup> These added pieces of information can make the experience of receiving care at other sites more efficient and enhance the decision-making process of clinicians. It reduces the need for patients to have to tell their story repeatedly. Access to an EHR, coupled with secure electronic messaging by NHS email or within clinical systems, can improve the timing and quality of communications, allowing more effective decision making and improved asthma outcomes.

Some local health economies are developing data-sharing agreements across their entire STPs/ICSs to develop condition-specific dashboards that collate all data held locally in one place.<sup>31</sup> While we still see a number of barriers impeding EHR integration across the NHS, we are beginning to see case studies where local health economies have overcome these barriers and are sharing their data more effectively to make improvements in asthma care.

### *Case study*

NW London STP have developed a platform called Asthma Radar which displays asthma risk factors on a single dashboard with data integrated from primary, community, secondary and social care sectors. This dashboard is then used by clinicians to easily identify which patients require the most urgent care and, over time, improve broader service planning for asthma. More information about the Asthma Radar can be found in Appendix 2.

### **Recommendations for increasing high-risk patient follow-up in primary care through improved data sharing across the NHS**

- Pre-conditions for digitally enabled asthma care:
  - Identify digital asthma champions across PCNs & ICSs and engage the Local Medical Council to help facilitate cross-organisation engagement and encourage early adopters to a new data-sharing model.
  - ICSs should develop a data-sharing agreement to facilitate cross-organisation data sharing. See example developed by NW London STP [here](#).
  - ICSs should develop standardised asthma templates to ensure patient data is consistently entered into their records across each PCN in their region.
  - PCNs, Clinical Commissioning Groups and ICSs should work together with the wider health and social care community to prioritise the use of a single digital record (both clinician and patient facing) that provides the most appropriate support and treatment based on a complete picture of the needs of a person with asthma.
- Build an internal flagging system into GP practice software for when a person with asthma is discharged from hospital so that a clinical review can be arranged in a timely manner.

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## Reforming the asthma review through risk stratification and population health management

A Population Health Management (PHM) approach to care enables the NHS to bring together data to identify specific populations whose needs are not currently being met.<sup>32</sup> Risk stratification of populations allows prioritisation of resources to help address groups with higher risk, enabling an anticipatory care model that prevents deterioration and reduces future hospital attendances and admissions. While a person with asthma may have an attack and present to primary care at any time, there are two clear peaks in asthma attendances in primary care: the winter season (driven by viruses including influenza) and spring/summer (driven by pollens).<sup>33</sup> There is also a significant peak in childhood asthma episodes during September related to a return to school.<sup>34</sup> These peaks should be looked at closely when conducting PHM on asthma populations.

At the heart of the current basic care model for asthma is the annual asthma review. This review is seen as the cornerstone to effective asthma care, providing the necessary support for the patient to continue self-managing their condition throughout the year. However, the current 'one size fits all' approach is often based on an outdated asthma register that does not allow for any distinction on the basis of risk or control, or understand the patient motivation and behaviours that influence how they engage with their asthma. High rates of non-attendance (approximately 30%) for appointments and the lack of value that some patients place in the annual review confirms the need for a change in the way asthma reviews are delivered for patients.<sup>35</sup>

A primary care practice will routinely run searches of its asthma patients to learn who hasn't yet had an annual review, so that further attempts can be made to invite them in for an appointment or to set up an exemption code stating that the patient is not engaging with the care being offered them.

### Case study

Portsmouth Group Practice activate a weekly search for asthma patients who have had either an acute episode (admission, visit to an acute care setting, or oral steroids from within the practice), exceeded a defined threshold of SABA inhalers or report poor asthma control on the RCP 3 Questions. These patients are prioritised by the respiratory team who contact them directly to arrange a detailed clinical review. See Appendix 3.

However, there is more that can be done to further understand this cohort:

- are there unifying features?
- are they well or poorly controlled?
- are they regular attenders at A&E?
- do they have mental health issues?
- are they from a particular community with a language or cultural barrier that needs addressing?
- do their personal circumstances, including working hours, make it difficult to attend appointments?

There will also be a wider cohort of patients suffering symptoms of asthma, including breathlessness, that have not been diagnosed. Primary care must evolve its use of data to better understand the needs of the population that it serves, helping clinicians identify which patients have a read code for a particular asthma trigger or have presented to their GP surgery, Out of Hours clinic, A&E or any other acute care settings during these peak times. Data can also be used to stratify patients according to need or risk.

### Case study

Wessex AHSN are working with local GP practices and Queen Alexandra Hospital, Portsmouth to identify high-risk asthma patients from GP registers. They then conduct Rapid Access Asthma Clinics (RAAC) and Severe Asthma Assessment Clinics (SAAC). The outcomes to date suggest that proactively identifying high-risk asthma patients and reducing the length of time before uncontrolled asthma is recognised reduces health costs and improves patient experiences. See Appendix 4.

Proactive support can be given to help prevent a loss of asthma control to at-risk patients ahead of these periods. This may be in the form of their annual review or sending a reminder to the patient to put in place preventative behaviours including taking preventer inhalers, carrying reliever inhalers, flu jabs or starting antihistamines as appropriate.<sup>36</sup>

While risk stratification at a basic level can be conducted now, further funding through the new GP Contract will allow for the development of robust risk assessment tools including algorithms to predict risk, based on machine learning.<sup>37</sup> These tools, when underpinned by greater data sharing between the NHS and patients, will further enhance the ability for primary care practitioners to identify high-risk patients in a timely manner. Proactive responses by clinicians could result in a reduction in asthma attacks and a more effective allocation of NHS resources. Timely action will also highlight to clinicians and patients a greater urgency in dealing with poor asthma control and can help to address the widespread complacency that is associated with asthma.

### Understanding the needs of the local asthma population<sup>38</sup>

Asthma subgroup	Understand their needs
<ul style="list-style-type: none"><li>• Patients with poor asthma control (reliever use)</li><li>• Patients with poor asthma control (Oral Corticosteroids use)</li><li>• Patients with asthma and high use of urgent care (A&amp;E, Out of hours)</li><li>• Patients with suspected severe asthma</li><li>• Patients with seasonal triggers (hayfever, winter, back to school)</li><li>• Patients who do not engage with annual review</li><li>• Patients who are poorly adherent with preventative medication</li><li>• Patients who do not have a Personal Asthma Action Plan on record</li></ul>	<ul style="list-style-type: none"><li>• Do each of these groups have cohorts based in certain postcodes, or of a certain age group, ethnic group? Do they have specific literacy needs?</li><li>• Are there cohorts that are school age, working age?</li><li>• Do you understand why they may not be engaging, or how you can engage them better? For example, are there language issues, cultural issues, literacy issues, healthcare preferences, digital preferences?</li></ul>

## Recommendations for reforming the asthma review through risk stratification and population health management

- PCNs should recognise the importance of asthma datasets and invest in procuring staff with skills in data informatics.
- Use asthma data to design a standardised approach to flagging inhaler usage within GP software.
- Clinicians and data experts should work together to interrogate local Quality and Outcome Framework data, clinical systems, and patient records to identify high-risk asthma patients to provide pro-active treatment and develop a broader population health management approach. See appendix I.
- ICS should prioritise spending towards digital training to staff across the region to ensure they feel comfortable using new asthma platforms and technologies.
- PCNs should each appoint a respiratory lead to drive improvements in services for people with asthma.
- Clinicians should continue to call for more funding and support to develop the infrastructure for anticipatory care for asthma populations as part of the future PCN contract.

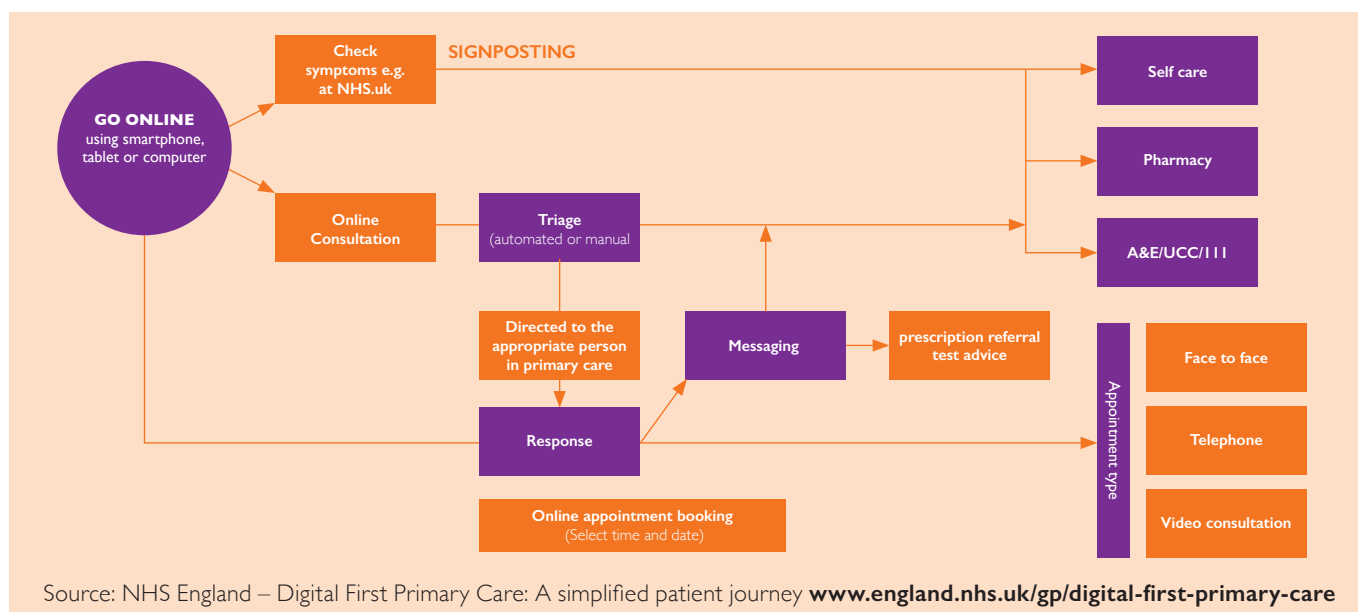
## Digital-first primary care

NHS England are actively pivoting towards a digital first approach within primary care. Using digital technology, patients and health professionals are being encouraged to explore how digital and online tools can better be utilised for advice, support and treatment.

This digital-first approach is evident in the commitments made within the LTP, including patients having a digital-first option when accessing primary care by 2023-24.<sup>39</sup> Contained within the GP Contract is the requirement that all patients have the right to online consultation and video consultation by April 2020 and 2021 respectively.<sup>40</sup> In order to meet these requirements NHS England have developed a programme of work to support practices and PCNs.

As part of the Digital-First Primary Care programme, NHSE have developed a simplified patient journey highlighting the types of digital opportunities that can impact how a patient transitions through primary care.

## The simplified digital patient journey



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Given the size and nature of the asthma population, the unmet need, and in particular, the strength of the evidence supporting the case for asthma self-management, there is a compelling argument to make asthma an initial exemplar for digital-first investment. Many of the opportunities highlighted above are discussed in the context of asthma below.

### **1. NHS App**

A recent innovation developed by the NHS is the new NHS App for patients.<sup>41</sup> This app is seen as the new digital 'front door' to accessing NHS services. With all practices connected to the NHS App, it is a great opportunity for people with asthma to access primary care services digitally. These services include access to records, repeat prescriptions and the ability to book and manage appointments. The NHS App should be integrated into the digital first primary care model as the digital 'front door' to a practice and the benefits and functionality promoted to people with asthma.<sup>42</sup>

### **2. Patient triage**

Triage has become commonplace in assisting the process of ensuring that patients see the right person, in the right place and at the right time. Triage has the potential to help ensure a smooth patient journey while allowing the practice to allocate resources more efficiently.

The first step for many patients in their interaction with healthcare professionals is telephone triage. This is now being supplemented by email and online consulting platforms and may provide a better experience for patients (especially those in full-time employment or education). In the case of acute asthma, the rapid assessment of symptoms may prevent unsafe delays in accessing care either in primary care or by rapid redirection to emergency services or A&E. With routine reviews, triage is a useful way of helping to risk-stratify, evaluate the patient's needs and provide an appointment when required. Appointment duration can be adjusted according to need. Some patients may only need a ten-minute appointment; other, more complex cases may require significantly longer. By having

flexibility in the length of appointments, the appointment length can be changed depending on the need of each patient.

### **3. Messaging**

Having the flexibility of using digital communications between patients and clinicians will enhance the continuity of care and support for people with asthma. Email channels, SMS messaging and WhatsApp can be useful ways for a practice asthma nurse to maintain a direct channel of communication with patients. This allows for real-time flagging of symptom deterioration or a channel to signpost patients to information in a timelier manner.

Digital communications can be an effective channel for communicating between appointments and for sharing data such as peak flow diaries, images and videos (e.g. of someone's inhaler technique). These can be useful to supplement traditional appointment types, especially where appointments are scarce or difficult for some patients to attend.

### **4. Online/remote consultations**

From April 2020, all patients have the right to online consultations. Online consultation platforms form an important part of the Digital-First Primary Care model and have the potential to transform how people with asthma receive care. NHS England have developed a practical toolkit that can assist GP practices and PCNs to implement online consultation platforms within their local jurisdictions.<sup>43</sup>

As outlined in the list below, asthma is the ideal condition for a Digital-First Primary Care model. Using the NHS App to book appointments, triage platforms to identify high-risk asthma patients, offer online consultations for patients who can't access face-to-face care, and provide instant messaging services like WhatsApp to signpost patients to additional asthma resources, we have a unique opportunity to transform how asthma care is delivered.

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### **Characteristics of asthma that make digital-first primary care models viable**

- Large proportion of people manage their asthma well so don't need regular face-to-face appointments in primary care
- Variable condition not always suited to face-to-face annual review on a fixed date
- High DNA rates for asthma reviews
- Basic self-management can be an effective treatment for most people with asthma
- Some predictable triggers e.g. viruses and pollen
- Routine data collection of symptoms, tests, medications and individual risk factors making it possible to identify patients who would benefit from urgent preventative interventions
- Economies of scale through PCNs allow for pooling of asthma resources to serve bigger population
- Insufficient number of trained respiratory workforce requiring new models of care
- When a large number of people with asthma, small changes to care yield large rewards

### **Recommendations for Digital-First Primary Care**

- PCNs to explore how the Digital-First Primary Care model could work for asthma within their own region.
- The NHS App should be integrated into your Digital-First Primary Care model as the digital 'front door' to your practice, with the benefits and functionality including electronic prescriptions and GP record access promoted to people with asthma.
- PCNs need to ensure that people with asthma are effectively triaged irrespective of whether they book their appointment online or via the telephone.
- Clinicians should look to utilise instant messaging services like WhatsApp to signpost patients to useful asthma resources, e.g. Asthma UK inhaler videos.
- PCNs should turn to the online consultation toolkit developed by NHS England when looking to develop a service to suit the varying needs of people with asthma. The online consultation toolkit can be found **here**.

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## Digital Asthma Action Plans

A key component to the annual asthma review and for the patient to effectively self-manage is the Personalised Asthma Action Plan (PAAP).

When used as part of a broader self-management portfolio,<sup>44</sup> PAAPs have been proven to allow people to better manage their symptoms, and so less likely to be admitted to hospital for their asthma. Worryingly, more than half of people with asthma in the UK (52%) – an estimated 2.8 million people – have not got one.<sup>45</sup> Asthma UK have been calling for PAAPs to be made digitally available to the patient since the release of our 2015 report titled *Connected Asthma*.<sup>46</sup> Digital PAAPs can be a key component to preventing acute asthma episodes and also facilitate improved information sharing between the clinician and the patient. A digital PAAP would be more convenient for patients as they won't need to carry around a paper form, hopefully leading to improved uptake and better engagement at future appointments.

While we have seen the digital asthma action plan available on the Asthma UK website downloaded an 150,000 times<sup>47</sup>, progress across the NHS to make the plan digitally available has been slow.

### How to digitise the asthma action plan

Recognising that the journey to a fully interactive and responsive digital PAAP, enabled by a fully interoperable patient health record, is still progressing, the following highlights options available now to achieve a digital PAAP.

**Stage One:** All people with asthma should have an asthma action plan in place to help manage their asthma. At a minimum, all asthma action plans should be available digitally as a static PDF document on a smartphone or as a document saved to a patient's email. This ensures that it can be referred to when required by either the patient or the clinician, or when either needs to share the plan to other groups including schools and carers.

**Stage Two:** To further drive uptake and ongoing engagement with digital PAAP, practices should be looking to integrate the digital PAAP with their local GP software and save it in the patient's care record. The patient should be able to access this record via the NHS App or through another digital gateway. GP software providers EMIS and System One now have asthma action plans available through their software platform. This functionality needs to be fully utilised by primary care staff to ensure each patient has a digital PAAP.

**Stage Three:** The ability for an asthma action plan to be updated in real time, based on the latest information contained within the patient's record, is key to future-proofing its survival as a primary self-management tool for people with asthma. A live document that responds to changes in medication, exacerbation protocols and emergency contacts ensures that both the clinicians and the patient are always looking at the latest information. This requires a live data feed between the patient record and the digital PAAP. This live feed can begin to encompass other data from wearable technologies, e.g. smart inhalers to further support self-management and clinical decision making. With the current movement towards shared standards and open APIs, we are not far away from making this vision a reality.

### Recommendations for digitising Asthma Action Plans

- Encourage all patients to have a PAAP. Use Asthma UK template [here](#).
- Ensure each person with asthma in your PCN has a digital PAAP through EMIS or System One or other applicable platform in the devolved nations. For information on how to develop a digital PAAP through the EMIS platform see [here](#).<sup>48</sup>



## Information provision for supported self-management

Patient self-management is key to reducing asthma attacks. Asthma resources are being distributed to people with asthma through an increasing number of digital mediums. The internet is increasingly being used to complement consultations with clinicians using images, videos and websites to help in health-related discussions and decision making. Teaching inhaler technique within consultations can benefit from the use of the Asthma UK's inhaler videos co-developed with a consortium of professional and patient organisations.

Signposting patients to websites most appropriate to their specific needs can be useful within appointments, as preparation ahead of appointments and as a follow on from consultations. Clinicians can share asthma resources with their patients through email, social media or messaging services like WhatsApp.

Asthma UK, having recognised the importance of a patient being able to self-manage their asthma, have a number of videos, platforms and online content that patients can be signposted to.

### Asthma UK patient resources

Asthma UK online health advice	The Asthma UK website contains up-to-date, clinically accurate health advice for people with asthma. This information is also available through the NHS.uk website. For more information or to signpost patients to the content see <a href="#">here</a> . <sup>49</sup>
Asthma UK social media platforms	Asthma UK has a number of social media feeds which are designed to take into account user experience (education levels, health literacy, digital preferences) and evidence-based health care. They provide bite-sized, relevant and engaging content designed to improve people's understanding of asthma.
Inhaler technique videos	Ensuring appropriate inhaler technique is a key component of the annual asthma review in primary care. Asthma UK have provided inhaler technique videos for many inhaler types to ensure patients have an easy reference guide when needed. The inhaler technique videos can be accessed <a href="#">here</a> . <sup>50</sup>
HealthUnlocked platform	HealthUnlocked is a platform which allows patients with specific conditions, such as asthma, to network and provide peer support. There are more than 13,000 people in the Asthma UK HealthUnlocked community. They can share their experiences and get answers to questions about their asthma from others in the community, and from Asthma UK's nurses if they want specialist advice. For more information see <a href="#">here</a> . <sup>51</sup>
Asthma UK helpline	Every year the Asthma UK Helpline takes over 7,300 calls from people with asthma who require support ranging from inhaler technique to having an asthma attack. However, younger people are not currently engaging with the service. They make up only about 4% of total callers to the helpline. In March 2018, Asthma UK launched a WhatsApp service to reach new audiences who were not engaging with the current helpline service. <sup>52</sup> Since the WhatsApp service was launched approximately 40% of users were under the age of 33. With younger people aged between 20-40 seen as a high-risk group for asthma attacks, it is important that Asthma UK develop tools like the WhatsApp service to reach these younger and non-engaged audiences to ensure they receive the support they need.

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Over the coming years, we will see an increasing number of apps, connected devices and wearables, each creating important data to support self-care, decision making and likely linking into the NHS App and NHS IT systems. Smart devices are already on the market, with our patients leading the way by purchasing smart peak flow meters, oximeters and air quality monitors. Smart inhalers are becoming an increasingly important aspect of asthma care in some care settings around the world. NHS England is committed to testing smart inhalers as part of the Long-Term Plan. In time smart devices and wearables will completely revolutionise healthcare, especially the interactions between self-care and medical support required for long term conditions such as asthma. For more information on the potential for connected devices like smart inhalers to revolutionise asthma care, please see the Asthma UK report titled Smart Asthma.<sup>53</sup>

***Recommendations for information provision for support self-management***

- Develop a list of asthma resources that should be distributed to people with asthma, after completing an asthma review, to help future self-management. These can be shared with individual patients according to need, or to cohorts of patients according to asthma triggers or time of year.

## Conclusion

Asthma is an exemplar condition for digitally-enabled care. The better utilisation of data and incorporation of new technologies into primary care for effective self-management holds significant promise for the delivery of an improved approach to asthma management. Currently, we have a reactive approach to asthma management, with many people with asthma only interacting with healthcare services and engaging with their asthma during and soon after an attack. The recommendations contained within this report have the potential to move us to a proactive approach where patient data is used to monitor and predict when someone is at risk of an asthma attack, or is required to make changes to their asthma management. To make this a reality, improved data sharing between healthcare services and the incorporation of technologies into NHS pathways is vital.

The breadth of the asthma population, the strong case for self-management and the variety of care settings mean that asthma should be considered by government, industry, policy makers and research funders as an exemplar disease area to invest in for health technology and data sharing initiatives. This report should serve as a blueprint for NHS staff to transform the management of asthma, ultimately leading to a reduction in asthma exacerbations and asthma deaths.

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# Recommendations

## Integrated Care System level:

1. Pre-conditions for digitally enabled asthma care:
  - 1.1. Identify your digital asthma champions across PCNs & ICSs and engage the Local Medical Committee to help facilitate cross-organisation engagement and encourage early adopters to a new data-sharing model.
  - 1.2. ICSs should develop a data-sharing agreement to facilitate cross-organisation data sharing. See example developed by NW London STP [here](#).
  - 1.3. ICSs should develop standardised asthma templates to ensure patient data is consistently entered into their records across each PCN in their region.
  - 1.4. PCNs, CCGs and ICSs should work together with the wider health and social care community to prioritise the use of a single digital record (both clinician and patient facing) that provides the most appropriate support and treatment based on a complete picture of the needs of a person with asthma.
2. ICSs should prioritise spending towards digital training to staff across the region to ensure they feel comfortable using new asthma platforms and technologies.
3. PCNs should each appoint a respiratory lead to drive improvements in services for people with asthma.
4. Clinicians should continue to call for more funding and support to develop the infrastructure to support anticipatory care as part of the future PCN contract.
5. PCNs should consult the online consultation toolkit developed by NHS England when looking to develop their own online service locally. The online consultation toolkit can be found [here](#).

## Primary Care Network level:

1. Build an internal flagging system into GP practice software for when a person with asthma is discharged from hospital or seen in another acute setting.
2. PCNs should recognise the importance of data and invest in procuring staff with skills in data informatics.
3. Use asthma data to design a standardised approach to flagging inhaler usage within GP software.
4. Clinicians and data experts should work together to interrogate local QOF data, clinical systems and patient records to identify high-risk asthma patients to provide pro-active treatment and develop a broader population health management approach. See Appendix 1.
5. PCNs should explore how the digital-first primary care model could work for asthma within their own region.
6. The NHS App should be integrated into the digital first primary care model as the digital 'front door' to your practice, with the benefits and functionality including electronic prescriptions and GP record access promoted to people with asthma.
7. PCNs need to ensure that people with asthma are effectively triaged irrespective of whether they book their appointment online or via the telephone.

## Clinician level:

1. Clinicians should look to utilise instant messaging services like WhatsApp to signpost patients to useful asthma resources, e.g. Asthma UK inhaler technique videos.
2. Encourage all patients to have a PAAP. Use Asthma UK template [here](#).
3. Ensure each person with asthma in your PCN has a digital PAAP through EMIS or System One or other applicable platform in the devolved nations. For information on how to develop a digital PAAP through the EMIS platform see [here](#).
4. Develop a list of asthma resources that should be distributed to people with asthma, after completing an asthma review, to help future self-management.

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## Appendix I:

### **Data codes to conduct risk stratification and patient case finding**

By 2021–22 PCN service specifications will require all PCNs to collaborate and offer more proactive care to high-risk patients who often have poorer health outcomes. PCNs and ICSs should start to think about how this will be adopted at scale for their local asthma populations.

Often the most challenging part to this process is identifying which data points are valuable in developing an effective risk-based model. Below is a set of asthma criteria designed to assist PCNs and ICSs in establishing such a process in asthma. Using asthma as the test case not only allows dramatic improvement to how care is provided for people with asthma, but also forces consideration of the underlying infrastructure and expertise required to successfully conduct this approach on other disease areas. Central to this is the need to procure inhouse data expertise. This skill set is crucial in not only designing the approach but also to continually improve and manage the process going forward. PCNs and ICSs should prioritise the hiring of such skills within their organisations and advocating for NHS England to fund or provide support in the future ‘anticipatory care’ PCN specification.

### **Example asthma data points considered:**

- Asthma diagnosis and newly registered in last seven days
- Asthma diagnosis in last seven days
- Asthma Register and four or more reliever inhalers in past 12 months (but not on COPD register)
- Asthma register and oral steroids in last 12 months (three or more issues)
- Asthma register and oral steroids in last seven days
- Asthma register and had admission in last seven days
- Asthma register and seen by A&E in last seven days
- Asthma register and seen by OOH in last seven days
- Asthma review done in last seven days

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## Appendix 2:

### Case study – NW London STP Asthma Radar Dashboard<sup>55</sup>

#### Overview

The 2014 NRAD report highlighted that over 60% of all asthma-related deaths had preventable risk factors. A lot of these risk factors were not recognised by clinicians for a number of reasons including, lack of patient data at the disposal of clinicians to identify these factors e.g. previous hospital admissions. In order to make it easier for clinicians to identify these risk factors NW London STP developed a risk stratification platform known as 'Asthma Radar'. The Asthma Radar platform places all asthma risk factors into a single dashboard with data integrated from primary, secondary and community sectors. This dashboard is then used by clinicians to easily identify which patients require the most urgent care and, over time, broader service planning for asthma.

#### Process

The Asthma Radar dashboard ranks all asthma patients according to their aggregate score of all asthma risk factors; number of hospital attendances, exacerbations, number of prescriptions, asthma care and their overall long-term asthma function. The dashboard works on a numbering and traffic light system.

For more information please see the NW London user guide<sup>56</sup> that walks the reader through the dashboard parameters in detail.

The formation of the Asthma Radar dashboard started five years ago when NW London STP wanted to use integrated care data to understand the needs of their local asthma population and develop more innovative ways to provide services.

#### The governance process was established encompassing:

- NW London Information Governance Group
  - This group created an information-sharing agreement that allowed providers to share data freely between each other.
- A clinical advisory group to oversee the creation and ongoing management of the Asthma Radar dashboard.

#### The Asthma Radar ecosystem consists of the following stakeholders:

- 8 CCGs
- 10 acute and specialist hospitals
- 373 GP practice's
- 4 mental health and community trusts

#### Data flows from GP Practices

- All GP practices in the NW London area use either EMIS or System One software.
- All practice data from EMIS or System One is accessed by a third-party company which extracts the data.
- This third-party will then purge the data of any patient who has elected to opt-out of the system, and any other sensitive data sets, before being sent back to the core data team at Asthma Radar.

#### Data flows from secondary care

- As part of routine reporting, secondary centres need to submit patient data to commissioners to receive financial reimbursement. Asthma Radar has signed an agreement with the relevant CCGs to access this patient data.

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## **Asthma Radar central data team**

- Asthma Radar data team collate all information for primary, secondary and community settings and integrate it all together into one patient integrated care record by using the patient NHS number.
- This data is then subject to a number of rules including QOF, electronic frailty index and admission data before being uploaded into the dashboard.
- Asthma Radar also allows data to be accessed by researchers in a de-identified format, however the process underpinning this data-sharing model is outside the scope of this report.

## **Benefits**

### ***Patient benefit***

- A patient's medical history can be reviewed by multiple healthcare professionals without them having to repeat it to each healthcare professional they interact with.
- Through the dashboards holistic approach to care, the patient is connected to the right professionals at the right time. For asthma, this can improve self-management and aid navigation in what can be a complex system.

### ***Clinician benefit***

- The dashboard supports the clinician by providing additional patient data to better inform decision making. This can be integrated within local clinical systems to identify patients not known to the practice and promotes proactive management.
- The Asthma Radar allows the clinician to risk stratify their asthma populations based on need so that they can conduct asthma reviews on the most high-risk patients. This leads to lower DNA rates and allows for greater opportunity to change patient behaviour, as patients are more engaged when their asthma is not under control.

## **Population health level**

- As NW London STP transition into an ICS and are required to conduct PHM, the Asthma Radar can be better used to understand the service needs of their population and undertake improved service planning.
- The platform can be used to actively case-find patients who are at high risk and provide the appropriate interventions.
- A view of patient activity can inform care planning and resource allocation.
- Real time management of patient demand means secondary care facilities can better manage bed allocation.

## **Barriers/considerations**

### ***Data sharing agreements***

GP practices were initially resistant to sharing data across NW London STP. The Asthma Radar team, having recognised this challenge engaged the Local Medical Committee to facilitate these discussions, ensuring GP practices felt comfortable with their legal obligations. Once a small number of GP practices signed up, other practices began hearing about the benefits of the dashboard and followed suite.

Secondary care was less resistant as they had already established processes to share their data with CCGs as part of their compulsory reporting requirements, so to take part in the system required no change in current practice.

### ***Adoption of Asthma Radar Dashboard***

The Asthma Radar dashboard creates a layer of transparency and accountability for clinicians that has never been there previously. This dashboard's accuracy and overall viability is dependent on clinicians embracing the dashboard and also coding their clinical notes correctly. In order to get clinicians on board with the dashboard, NW London STP worked with local PCNs to develop effective case studies that illustrate the effectiveness of the dashboard for clinical use.

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### **Engaging with stakeholders**

With over 400 organisations within NW London, stakeholder engagement was a huge challenge for the NW London STP. Recognising that not all sectors could be engaged at once, they focused on early primary care adopters as the exemplar before moving onto secondary care services and, finally, social care providers.

### **Conclusion**

The Asthma Radar platform is a great example in showcasing how, through the development of data sharing agreements, real-time patient data can be pulled from all health sectors within a STP/ICS and combined into a single dashboard to enhance patient case finding, risk stratification and allow for more informed decision making by health professionals. This process allows asthma risk factors to be identified a lot earlier, ensuring that people with asthma are directed to the most appropriate care setting in an efficient way. While initiatives like OneLondon are looking to scale this concept across all five London STPs, ICS systems across England and their equivalents in the devolved nations should be looking to replicate and adapt a similar model within their local populations.

For more information, please email [nwlccgs.wsic.dashboards@nhs.net](mailto:nwlccgs.wsic.dashboards@nhs.net)

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## Appendix 3:

### Case study – Reimagined Respiratory model of care, Portsdown PCN

#### Overview

Portsdown Group Practice is a group of six GP surgeries across the wider Portsmouth area, with a patient catchment size of 44 000, allowing it to be registered as its own PCN. With an increasing register of patients with respiratory disease and a shortage of appropriately skilled respiratory nurses, the practice team decided to develop an alternative approach to deliver care. The new system would use risk stratification in order to respond to patient need while enabling the practice to achieve its QOF targets.

The practice collated routinely collected patient data that can act as signals of poor asthma control. This included RCP 3 Questions, reliever inhaler prescriptions, oral steroid prescriptions and unscheduled care events. Using this data, the respiratory team stratified the results to identify those patients at highest risk of future asthma attacks. The team then contacted the patient by telephone and commenced a detailed assessment of the patient's asthma. This review was completed, where appropriate, in a face-to-face appointment at a time and venue that suited the patient. The clinical team were given the flexibility to allocate an appointment length according to the needs of the patient. Some appointments would only need to be ten minutes and others as long as 60 minutes.

This approach streamlines the use of team resources, allows personalisation of the clinical review according to need and makes every contact more relevant for people with asthma. By being more responsive to patients' needs and their pattern of disease, Portsdown hopes to improve the quality and safety of care above current QOF requirements.

#### Process

1. Patients on the Portsdown asthma registry are sent an SMS or email via third party software.
2. This text message invites them to complete an asthma questionnaire (RCP 3 Questions) in line with the requirements of QOF.
3. Results from this questionnaire are sent to a business intelligence team in the Portsdown practice which is responsible for managing practice data.
4. The business intelligence team codes the data from the questionnaire and inputs it directly into the patient record.
5. Patients are also encouraged to download an app that will invite them to complete the questionnaire, allowing for the results to be coded automatically into their record (so no need for the business intelligence team to manually enter the information).
6. The business intelligence team conducts a weekly search of patient records and stratifies according to the patients' asthma control before sending the data over to the respiratory team. Searches are also performed for patients on the asthma register who have had an unscheduled care episode or been prescribed oral steroids in the last week and for those that have been prescribed six or more SABA inhalers in the last 12 months.
7. The respiratory team have an allocated time to review the lists and to start contacting the highest risk patients, while also meeting to discuss difficult cases.
8. The respiratory nurses contact the patients by telephone to perform an initial assessment. A follow-up face-to-face or video consultation appointment is arranged (if necessary) at a time that the patient can attend. The nurses have flexibility to allocate an appointment length appropriate to the needs of the patient.



## Benefits

Risk stratifying asthma patients according to need every week ensures that the most at-risk patients are seen as a priority. Those patients who have well-controlled asthma can be managed via a lighter touch approach.

## Barriers/key considerations

1. Consider what data points to capture; The practice came together to map out what data was needed to best inform patient triage.
2. Clear communication with all clinical and non-clinical staff was required from the outset to ensure everyone felt part of the journey.
3. Staff training to ensure they understood the system and to make them comfortable working with data.
4. Build in an evaluation plan from the beginning and conduct evaluations throughout.
5. Contacting the patient for an appointment can be challenging – push for mobile numbers of all patients each time they visit the practice to ensure they are updated often.

## Outcomes

	2016	2019
Respiratory slot type DNA	508	8
Asthma QOF exception	82	43
Asthma prevalence	2534	2942
Asthma QOF points	45/45	45/45

Given the change in approach has been functioning for less than 12 months, a comprehensive evaluation of the service is yet to be completed. Despite this, initial results suggest an improvement in patient attendances, improved care to disengaged patients and improved revenue for the PCN through maximising QOF outputs.

Prior to the service being introduced, there were 508 DNAs for respiratory-only appointments, compared to just eight after the service was introduced; a reduction of DNAs of 98%. The previous figure of 508 wasted appointments (costing the practice approximately £18.5k), was demoralising for the respiratory team and led to patients not receiving the care that they needed to stay well. Since the introduction of the new service, asthma prevalence has increased by 14%, meaning more patients have been identified that had not typically been engaging with primary care system. While the process has been running, total revenue from QOF has been increasing for the practice.

## Conclusion

The change to asthma management within Portsdown has largely occurred without the need for upfront investment, a barrier commonly experienced for new digital projects in healthcare.

Asthma is a useful testbed for applying new digital processes because of the nature of the condition, the vast numbers of people with asthma and the younger demographic of the group. By taking a similar approach, patient care and resources can be streamlined using stratification to make sure that the higher risk patients get the right care, at the right time, and with the right person. Reimagining asthma care in this way can take advantage of the new economies of scale created by PCNs, allowing them to invest in additional roles like a data team.

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## Appendix 4:

### **Case study – Use of the GRASP tool for case finding as part of the MISSION Asthma study protocol**

#### **Overview**

Asthma care is a major burden to the healthcare system in Wessex. The high prevalence and under-diagnosis of asthma causes a large number of potentially avoidable hospitalisations, and overall clinical outcomes are worse than the national average. The MISSION programme is piloting a new model of asthma care across Wessex.

#### **Process**

1. The team at MISSION start by using a tool called GRASP. GRASP interrogates GP records across Wessex clinical commission groups based on a set of read codes created by the user. Such read codes include:

- a. Frequent exacerbations
- b. ED visits
- c. Hospital admissions
- d. 3> controller medications
- e. Use of frequent short-acting bronchodilators
- f. Quality of life data and asthma triggers

2. Patients were then assessed through MISSION Rapid Access Asthma Clinics (RAAC) and Severe Asthma Assessment Clinics (SAAC)

#### **Outcome**

- Prior to their session, 64% patients felt confident in managing their asthma, compared to 93% at end of session.
- 96% were satisfied with the booking process for the clinics.

#### **Conclusion**

Proactively identifying high-risk asthma patients and reducing the length of time before uncontrolled asthma is recognised reduces health costs and improves patient experience.

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