

# Innovating for Improvement

**Rapid Access to Pulmonary Investigation Days**  
– the **RAPID** Programme in Suspected Lung  
Cancer

**University Hospital of South Manchester NHS Foundation Trust**



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## About the project

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**Project title:** RAPID Access to Complex Pulmonary Investigation Days – the RAPID Programme in Suspected Lung Cancer

**Lead organisation:** University Hospital of South Manchester NHS Foundation Trust (UHSM)

**Project lead(s):** Dr Richard Booton PhD FRCP

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## Part 1: Abstract

Greater Manchester (GM) has some of the worst outcomes for lung disease in the United Kingdom, and lung cancer is one of the area's biggest killers. Greater Manchester Cancer is responsible for the management of approximately 2500 new cases each year, but the diagnostic challenges are not unique to GM. Diagnostic pathways are complex, typically involve multiple Trusts and offer a poor patient experience. Emerging international data suggests that pathway delay may also adversely affect survival, particularly in early stage disease. The RAPID Hub has evaluated over 1000 referrals since March 2016 & has the potential to providing an innovative solution to lung cancer diagnosis and management with a clear impact on nearly 40,000 patients per annum nationwide.

The RAPID programme was launched by the lung cancer team at UHSM to reduce the time taken to complete investigations in patients where there is any suspicion of lung cancer. The aim is to ensure all patients have a clear diagnosis, whether or not that is lung cancer, within seven days of referral. Any patient with suspected lung cancer was eligible for the programme. The core, underpinning aims of the programme are to:

1. Improve patient experience
2. Reduce variation & standardize diagnostic evaluation
3. Eliminate medically unjustifiable delay
4. Offer a supported & coordinated programme of multiple investigations on a single day, where possible.

Unique to Greater Manchester currently is the establishment of an NHS lung cancer screening programme to tackle the problem of late-stage presentation at diagnosis. Improved diagnostic pathways aligned to the screening programme are necessary for effective future implementation.

The programme has enabled and embedded

1. Next day access to CT scanning for GP 2-week wait referrals
2. Daily triage of referrals with 'hot-reported' CT scan
3. Same day confirmation of 'no cancer'
4. Integrated nursing & navigation support for patients requiring investigation from referral to treatment
5. Clear investigation plan on first clinic attendance with all appointments pre-booked
6. A RAPID hub, with dedicated patient & physician hotlines, and email addresses.

The key successes of the programme are:

1. We have eliminated two-week wait and 31-day breaches
2. We have increased the number of CT scans performed by day 7 by 3.5-fold to 92% of GP referrals
3. We have reduced the time from GP referral to outpatient clinic, with a fully reported CT scan, by 6 days, from an average of 10 days to 4
4. We have increased the number of MDT discussions by day 14 from GP referral by 5.25-fold (42%), and by day 21 by 4.5 fold (77%)
5. We have confirmed the absence of cancer on the day of CT scanning, compared with an average of 6 days previously
6. We have improved patient experience, patient satisfaction and provided care that mattered to patients, despite the increased speed of the pathway.

What were the main challenges and enablers to success that would be useful for others looking to adopt your intervention to know about?

### **Challenges**

- *Command & Control:*  
For optimal efficiency & communication, attaining control over multi-departmental appointments is ideal. Collaborative working overcame some of the issues but sustainability will require this to be addressed.
- *PET scanning:*  
No control over access and limited collaborative working hindered effective pathway planning & delivery. Hot-reporting was never achieved. No PET provision on-site prevented same-day planning for necessary tests.

### *Success:*

New way of working demonstrated clearly the advantages to staff & patients, and the concept was extended to additional elements of the service i.e. cancer services, surgical referrals, external diagnostics referrals. Additional recruitment, lack of office space or a bespoke outpatient area limited further service development.

- *Information Technology:*  
Lack of engagement to enable efficient assessment, monitoring and outcomes has made data management challenging, exacerbated by failure to recruit a data manager. Also limited the establishment of a fully functional virtual 'ward round' of patients under investigation.

### **Project Enablers:**

- *Champions* – the successful implementation of RAPID required programme champions across the disciplines to establish buy-in at all levels, quickly resolve problems and develop/ implement additional solutions to service challenges.
  - *Selling Belief/ Handling Change* – this was a key element to successful implementation within individual services, but taken together across the Trust allowed a significant culture change with minimal resistance.
  - *Money/ Pump-priming* – the vast majority of staff, whether medical, nursing or administrative, were not recruited specifically for this programme. Rearrangement of existing commitments within job plans and close team working was required for this. Where additional resource was identified, in administration and patient navigation, the monetary resource provided by the Health Foundation, MacMillan & UHSM Endowment Funds proved very helpful. However, the required investment was relatively small.
- Will the intervention be embedded into business as usual?

Yes. The immensely positive patient feedback and collegial team-working environment the programme has mandated embedding the model into core business. It is now considered a flag-ship programme for the wider Trust and its clear success has led to Greater Manchester Cancer requiring the wider Network to consider how it can be implemented across the Network.

## Part 2: Progress and outcomes

As a major cardiothoracic centre with significant resource, we were perplexed at the inability to eliminate 31 and 62-day breaches for patients with suspected lung cancer. Following a visit to the Mayo Clinic, it became clear that the evolved system we had, like many Trusts, had focused on government directed 'pathway' success and was unable to meet the true needs of patients using the service. We therefore instigated a process review for 2ww referrals to enable a revolution in cancer care. Core components to this were

1. Ensuring patient experience was as important as patient outcome
2. Adopting a same/ next day philosophy
3. Arranging multiple tests on a single day where possible by creating a diagnostic assessment unit
4. Creating an integrated care pathway for optimal communication, from referral to treatment across medicine, radiology and surgery
5. Aiming for completed investigations and MDT discussion within 7 calendar days.

The main adjustment to our original aim was the inclusion of all referrals with suspected lung cancer, to include internal hospital referrals and referrals from the NHS lung cancer screening pilot.

Ultimately, the ambition was to seamlessly link this RAPID assessment to an expedited surgical and non-surgical treatment, particularly for early stage radically treatable disease where delay appears deleterious, and hopefully contribute to an improvement in outcomes whilst maintaining or improving the patient experience.

Our baseline performance prior to the implementation of the RAPID programme (March 2015-March 2016) was provided by the UHSM Performance & Information (P&I) Team from the Somerset Cancer Registry (SCR).

1. 2ww referral date to CT scan
2. 2ww referral date and outpatient clinic date
3. 2ww referral date and MDT date

A MacMillan Cancer Improvement Programme audit of the UHSM diagnostic pathway between June 2015 and May 2016 provided additional information in relation to patient reported delay (diagnosis & treatment), CT performance and CNS availability.

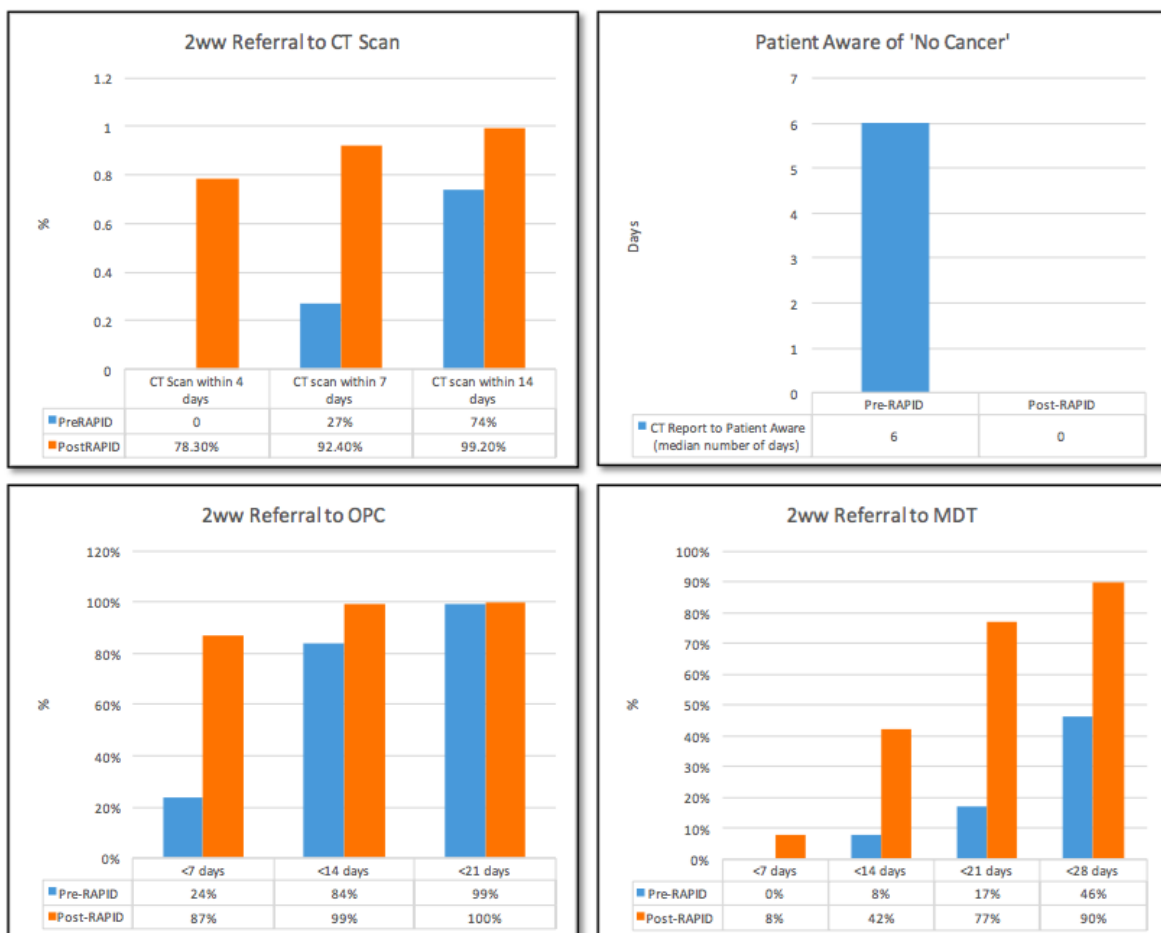
The RAPID programme went 'live' on 7<sup>th</sup> March 2016. A bespoke access database was used to capture all patients referred for assessment. Data fields permitted the prospective collection of the following:

1. Two-week wait referral to CT scan
2. CT Scan reporting time
3. CT scan to physician triage
4. Triage to outpatient cancer clinic
5. Cancer Clinic to MDT.

It is therefore also possible to calculate the time between 2ww referral and cancer clinic, and MDT. We analysed this database, and sought corroborative analysis from the P&I Team, including independently entered data from the SCR.

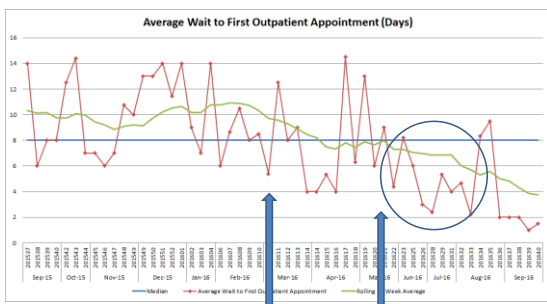
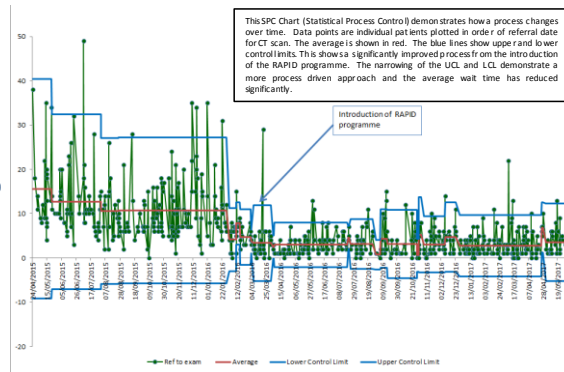
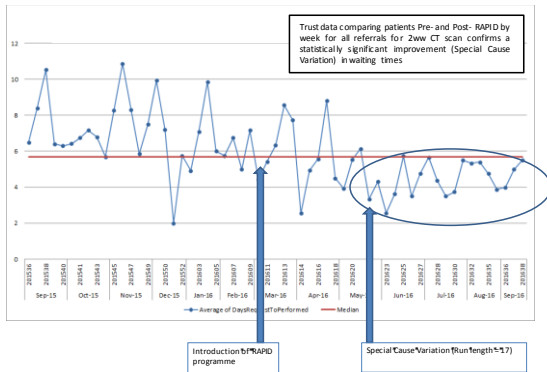
From a patient experience perspective, we used two methods of assessment. Firstly, a random sample of patients were asked to complete a 'postcard questionnaire' immediately following MDT clinic on completion of their investigations and explanation of the results and management plan. Second, we sent a detailed questionnaire to over 1000 patients in June 2016 to ask for their comments of the RAPID programme. Questions at both time points reflected the quality, speed and acceptability of the service, whether they were treated with respect & compassion, and whether communication was satisfactory.

The graphic below reflects the primary analysis of the prospective bespoke database & demonstrates the improvements made:

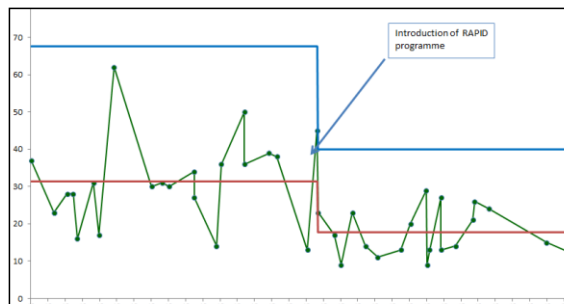


Data analysed by the Performance & Information Team from the bespoke database and with additional data from the SCR is presented here, with a focus on process analysis.

There is clear evidence of a statistically significant improvement in performance, with reduction in wait times to CT scan, outpatient clinic assessment and MDT discussion, from 2ww referral.



The high reduction in median waiting times in the 8 months following the introduction of the RAPID programme compared with the 8 months prior to it is statistically significant improvement. A 12 week rolling average is shown and confirms downward trend from March 2016 onwards. The 8 week period is relatively static wait times.



This graph uses data from the Somerset Cancer Registry to highlight days from referral to MDT. This shows significantly improved process from the introduction of the RAPID programme. The narrowing of the UCL and LCL demonstrates the average wait time has reduced. Data points are individual patients plotted in order of referral date. The average is shown in red. The blue lines show upper and lower control limits determined from historical data.

Patient feedback from approximately 30% of 1000 patients to whom a questionnaire was sent in June 2017 is summarised below.





When asked to highlight anything or anyone that was particularly good, 56% of respondents entered free text summarised in Figure 2. Consistent themes emerged on the excellence of the service, caring staff (across departments), the speed of service and good communication.

Typical examples include

- ‘A first class service all round’;
- ‘All the staff at Wythenshawe Hospital so caring, all went the extra mile’;
- ‘Consultants and everybody were excellent. Through a worrying time for me having lots of scans and surgery, I couldn’t have had better care’;
- ‘Fantastic from start to finish. I was so scared but the team were there for me. Lead nurse and the doctor who gave me the results’;
- ‘High praise for the whole unit, complete efficiency’;
- ‘My cancer was detected on May 4<sup>th</sup>, operated on 13 days later. Fantastic service by the most dedicated people I have ever met’;
- ‘I was extremely fortunate to have benefited from the RAPID programme which had only recently started at the time I was being diagnosed. Without exception, the staff were efficient, caring and sensitive. Even now I am stunned at how efficient the NHS was’;
- ‘Efficient. I’ve never enjoyed the NHS before, very very impressed’.

To successfully establish the RAPID service a number of service delivery changes were required that then led to further related initiatives that enhanced & expanded the current service whilst maintaining the same ethos of eliminating unnecessary medical delay.

<b>Pathway Improvement</b>	<b>Type of Change</b>	<b>Pre RAPID Service</b>	<b>Post RAPID Service</b>
Nurse-led triage clinic in collaboration with physician & thoracic radiologist 5 days a week	RAPID Delivery	No service	Assesses 40-50 2ww GP referrals per month, on a daily basis. Patients are informed of the CT scan result the same day.
Pathway Navigators	RAPID Delivery	No service	3 patient navigators, responsible for coordinating, communicating and sign-posting appointments
Virtual board round of all patients under investigation	RAPID Delivery	No service	15-30 patients on average discussed daily
Establishment of RAPID Hub, for co-location of critical staff	RAPID Delivery	No service	Now reviews over 100 referrals per month

Delivery and Coding of multiprofessional outpatient clinic consultations (* multiprofessional vs single professional OPC visits)	Enhanced Service	2 & 220 patients, respectively*	160 & 80 patients respectively*
Integrated External Diagnostics Hub	Enhanced Service	External referrals sent to individual Consultants, managed independently & results returned when available/seen	Single point of contact for bronchoscopy/ EBUS/ interventional thoracic radiology, next-day appointment scheduling and results management
Nurse-led MacMillan Lung Cancer Nurse Specialist telephone clinic	Enhanced Service	Ad-hoc service	Formal OPC established twice per week, (40 patients pcm)
Appropriate clinic slot utilisation	Enhanced Service	Unknown	100% slot utilisation for lung cancer and pleural services
Establishment of Nurse-Led Thoracic Surgical Hub	Enhanced Service	No service	Triage of thoracic surgical referrals, to ensure all required diagnostic, physiological & staging source documents, image transfer are available for same-day decision making when patient attends surgical OPA. Missing information is either obtained, or additional tests requested prior to OP visit to avoid delay in decision-making

Delivery of MCIP Lung Cancer Screening Pilot Referrals	Enhanced Service	No service	MCIP Pilot commenced in June 2016, and RAPID facilitated screen-detected cancer assessment, enabling quick access to radical treatment in >90% of referrals
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### Part 3: Cost impact

The RAPID hub was initially funded through the Health Foundation Grant (£53k to date), MacMillan (Band 5 Nurse for 2 years) and UHSM Endowment (Administrator Support and IT infrastructure). The external funding allowed for the set-up of the RAPID hub particularly around the pump priming of staff, such as the Navigators who are pivotal in ensuring that the patients get through the system efficiently. The funding also provided the back-fill support for Consultants time.

The main source of commissioning for the service comes through the NHS payment by results tariff for the outpatient and diagnostic work that the team perform through the RAPID hub pathway. As mentioned in pathway improvement the development of improved coding of outpatient clinics to reflect multi-disciplinary input and diagnostic procedures are supporting a financially sustainable service.

*Was there a financial evaluation of your project?*

Due to the infancy of the project there has been no health economics review to date, once the programme has matured it would be appropriate to commission the report.

The new pathway is an additional cost to the Trust due to the infrastructure needed in comparison to what existed previously. This cost has however been marginal due to the goodwill of staff and the existing structures the Trust has in place. The recurrent new infrastructure pay cost based on current activity levels is £161k excluding consultant time and minimal non-pay expenditure; this is offset by the increased outpatient and diagnosis activity and its associated income.

Due to the integrated nature of the programme, there has been an additional cost at different stages in the pathway with an increase in demand of thoracic radiologist capacity and cardiothoracic surgery against previous pathway plans. Due to the earlier detection of cancer through the lung cancer screening pilot and the rapidity of diagnosis the acuity of these patients is less than the previous case mix bringing in lower complexity tariff rates, which brings long term financial benefits to the local health economy.

*How did you calculate the existing and new costs (including implementation costs)?  
Are there any issues or limitations that need to be taken into account?*

To manage the governance of the funding it is recommended that a specific cost centre is established to record the costs associated with the RAPID programme. Along with regular interaction between the finance team and service, this allowed for the discreet recording of the income and expenditure of the project. A limitation in the data is the large amount of the work that was done in establishing the RAPID programme through the goodwill of staff in post which has not been quantified. The Trust is also in the development stage of implementing Patient Level Information Costing, once this has been fully implemented this will provide a rich resource of data which will include the true input of Clinical Support Services, which is currently not included in the profitability of the service.

## Part 4: Learning from your project

The core aim of the RAPID programme was to speed up access to diagnostics, eliminate unnecessary delay and improve the patient experience for patients with suspected lung cancer. We have shortened the diagnostic pathway such that 8%, 42%, and 77% of referrals are discussed at MDT with completed investigations by day 7, 14 and 21, respectively compared with 0%, 8% and 17% prior to the introduction of RAPID. As a result, 40% of patients received surgery within 14 days of MDT & we are now working to robustly establish appropriate working practices within thoracic surgery and medical oncology to improve this even further.

Prior to the programme, the received wisdom from GM Lung Cancer Pathway Board raised concerns in relation to speed & a poor patient experience. This was at odds with our personal experience of what patients with suspected lung cancer wished. We were therefore a little surprised by the ferocity & frequency of spontaneous day-to-day positive feedback, an immediate pointer of success. This acted as a positive spur, and converted the few sceptics we had. More formal feedback post MDT, and in June 2017, has provided a clear steer for subsequent service delivery, that speed is not bad for the patient experience but is indeed expected, & mandates the completion of investigations within a maximum of 2 weeks.

It was hugely rewarding to receive & read the powerful positive feedback given the efforts of all staff in implementing the programme in parallel to existing commitments. But we should note that the quality of the service acknowledged by patients is in the context of a well resourced, highly motivated thoracic multidisciplinary team. It does not necessarily follow that the same experience or results can be attained in less resourced or less specialist environments if an enthusiasm for same day working is not present.

PET scanning is the first diagnostic required following CT in approximately 60%. We do not provide this on-site currently and partnered with The Christie Hospital to deliver a next-day appointment with overnight-reporting. Unfortunately, in reality this level of service never transpired despite several meetings at The Christie to resolve. The current NHSE standard of performing PET within 5 days was only met in 37% of referrals, and next day reporting was never achieved. Unnecessary delay in obtaining a reported PET scan contributed to a significant elongation of the patient pathway that could be avoided with greater resource, better collaboration and furthermore an on-site scanner would improve the patient experience/ minimise unnecessary travel. Further discussions have identified a conflict between the specialist commissioning performance indicators for the PET contract and the requirements of the regional service users that we are currently trying to resolve (NHSE contract requires a reported scan within 7 days, whereas Manchester Cancer wishes a local target of 3 days). Lack of control of this aspect is a serious threat to the regional roll-out of the RAPID programme required by the Greater Manchester Lung Cancer Board, both in terms of patient outcome and experience.

Traditionally, staff are located based on budget source, consultant teams or managers rather than the needs of a service. Providing adequate space for co-location of staff proved a significant challenge, particularly during a planned refurbishment of our old bronchoscopy unit to create a dedicated environment for the RAPID hub, including outpatient rooms, RAPID hub office and radiologist reporting

room. Co-location was considered essential to improve communication amongst the medical, nursing, navigator and support staff, to aid business intelligence, and to provide a clear presence within the Trust for ease of referral. Co-location also reinforced that team integration was pivotal for coordinated day-to-day management, to ensure cross-cover/ staff efficiency and staff education.

Clearly the programme has evolved considerably since the outset, and in addition to coordinating the care of GP 2ww referrals, now manages all other hospital referrals with suspected lung cancer and additional services, such as the external referrals diagnostics hub, thoracic surgical triage and quality assurance/ performance monitoring. RAPID also ensured that patients referred from the first NHS pilot of lung cancer screening were investigated in an appropriately short timeframe, to maximise radical treatments and minimise patient harm. This unexpected evolution reflects the broad utility of the RAPID approach, but also the importance of integrated Trust-wide team working that enabled the best possible patient centred multidisciplinary experience regardless of the departments in which the patient visits at any one time. Additional ongoing work in the treating services (surgery/ oncology) will complete an integrated service transformation that brings lasting positive benefits for patients.

So it is fair to say that we have exceeded our expectations, and we have been surprised by the effusive & spontaneous positive patient feedback received. Improving efficiency and eliminating unnecessary delay has been possible by collaboration, coordination and communication utilising a single service hub model. A significantly enhanced patient experience was evident. We now look forward to ensuring sustainability & preserving the core principles as the Trust merges with two other hospitals, and delivery of an expanding NHS lung cancer screening service.

## Part 5: Sustainability and spread

*Will your intervention be sustained beyond the funding period?*

The RAPID programme is now an established service within UHSM. This will be consolidated by the commissioning of a new outpatient space, reporting room and Hub in September 2017.

The expansion of the NHS lung cancer screening programme in North Manchester relies on rapid assessment of referrals and will be a further driver, together with the merger of UHSM with two partner Trusts to sustainability and service expansion, a project now being led by the Chief Operating Officer at UHSM.

GM Cancer has encouraged other Trusts within the Network to consider how this model can be applied, and we are working with our partners in the South Sector to extend delivery to Mid & East Cheshire.

*What (external) interest and recognition have you had on your innovation?*

1. Regional & National media coverage, including the BBC
2. Oral presentation at the British Thoracic Oncology Conference 2017
3. Adoption of RAPID programme by Greater Manchester Cancer Lung Pathway Board
4. Positive feedback from a Trust visit by Professor Mike Morgan, National Clinical Director for Respiratory Disease at NHS England.
5. Acknowledgement from GM Steering Committee on Lung Cancer Screening that the RAPID programme is a necessary prerequisite for implementation of lung cancer screening in GM.

*What Do You Think is Replicable about the Project and What is Specific to Your Organisational Context?*

UHSM is a large thoracic centre with sub-specialty physicians, a fellowship programme and 5 cardiothoracic radiologists, with a lung cancer service that has two assessment clinics per week, two MDT's each week and access to EBUS Monday-Friday. Consequently, there is significantly more resource than that available in most acute Trusts. However, the majority of change was a reorganisation of existing work & optimising new workflows, and any new appointments were focused on administrative/ navigator roles & reallocation of nursing staff roles, that can be replicated in any setting. The implementation of next-day CT scanning, and hot-reporting should be replicable though not necessarily using dedicated thoracic radiologists. Breaking down artificial inter-departmental boundaries and refocusing on patient need is replicable assuming there is a desire to achieve it. A flexible workforce (with Champions) has been critical to the success of the programme, and the use of a single nursing team across the 'journey' has become an integral part of the RAPID philosophy.

*What additional resources will you need to support this activity beyond the funding period, and from whom?*

No further resource is required to continue the programme in its current form. As mentioned earlier, we have refurbished an unused clinical space to provide a bespoke environment for the service which will meet current demands & facilitate a transition to new patient clinic every morning. The most significant additional investment required is on-site PET scanning that will enable a significant reduction in waiting times, further reduce the time from referral to MDT and maintain an excellent patient experience. We are working with colleagues in GM to secure this investment.

However, other local & regional initiatives will require an expansion of the service and will be resourced through the usual business planning process.

*What are some of the upcoming milestones / activities beyond our funding?*

1. Business plan for a mobile PET scanner to be submitted in September 2017
2. Extend RAPID programme to South Sector (Mid-Cheshire and East Cheshire NHS Trusts) by March 2018
3. Secure contract for North Manchester Screening Programme – August 2017 (275 expected referrals)
4. Establishment of internal working groups to examine infrastructure required for sustainability from service expansion Sept 2017.



## Appendix 1: Resources and appendices

### MacMillan report - Manchester's Lung Health Check Pilot



lung-health-check-m  
anchester-report\_tcn

**Greater Manchester Cancer Plan** <http://www.gmhsc.org.uk/assets/06-GM-Cancer-Plan-Cover-Sheet-FINAL.pdf>

### Media coverage

BBC News report - <http://www.bbc.co.uk/news/uk-england-manchester-39272124>

ITV News report - <http://www.itv.com/news/granada/2016-02-04/lung-cancer-patients-in-manchester-first-in-uk-to-benefit-from-a-new-scheme-aimed-at-slashing-treatment-waiting-times/>

Manchester Evening News report - <http://www.manchestereveningnews.co.uk/news/greater-manchester-news/wythenshawe-hospital-lung-cancer-breakthrough-10832873>