Investigation Report

on a complaint made by

Mr Brown, County Mayo

against

the Health Service Executive

April 2010

Contents

1. Introduction

1.1 Background

The complainant's name and that of his late wife have been changed in this Report to protect their identities. The names of the staff of the HSE, and others, have also been changed.

The complainant's wife, the late Mrs Brown, was a 53-year-old woman who attended her GP, Dr Doyle, on 5 November 2004. She was being treated by Dr Doyle for Raynaud's disease (a vascular disorder which affects blood flow to the extremities, fingers, toes, nose and ears, when exposed to changes in temperature, causing pain and discomfort). On the occasion of this visit to Dr Doyle, she also complained of shortness of breath and rapid weight loss. Dr Doyle referred her to Mayo General Hospital, where as a public patient, she was ultimately placed under the care of Dr Smith, Consultant Physician and Gastroenterologist**.**

Mrs Brown was assessed in Mayo General Hospital in November 2004, by Dr McKeon, Registrar to locum Consultant, Dr Charles. At this assessment, further investigations were requested and subsequently they were scheduled.

Both tests were to be carried out at Merlin Park Hospital, Galway. Mrs Brown was sent home pending these investigations.

In December 2004, Mrs Brown's husband took her to Merlin Park Hospital, Galway to undergo her scheduled Lung Function Test. Following the test, her husband drove her home. Four days later, she became ill at home and died suddenly in the ambulance on her way to Mayo General Hospital. The official cause of death was Pulmonary Hypertension. (Pulmonary Hypertension is a rare blood vessel disorder of the lung in which the pressure in the pulmonary artery (the blood vessel that leads from the heart to the lungs) rises above normal levels and may become life threatening.)

Following Mrs Brown's death, her daughter, Miss Brown, rang Dr Smith in an effort to find out what had happened to her mother. Dr Smith spoke to her and said he would investigate matters. Some weeks later, Dr Smith's secretary rang Miss Brown to say that Dr Smith had not forgotten about her, but that he was going on leave for three weeks and would look into the case on his return.

In the middle of February 2005, Miss Brown rang the clinic again as she had not heard from Dr Smith. The secretary advised that Dr Smith was away, but said that she would let Dr Smith know that she had called.

In March 2005, an appointment letter issued from the Endoscopy Unit in Mayo General Hospital, addressed to the late Mrs Brown, advising her that Dr Smith had requested her attendance at the Day Services Unit in April 2005, for a Gastroscopy examination (a visual examination of the inside of the gullet, stomach and duodenum, using an endoscope).

On 5 April 2005, in the absence of any response from Dr Smith, the family wrote and complained to the Hospital Manager, in Mayo General Hospital, Mr Ryan, who later carried out an investigation. In an interim reply to Mr Brown, on 7 April 2005, Mayo General Hospital apologised for the distress caused by the issue of the appointment letter of 8 April 2005. It explained that, due to the existence of waiting lists for the endoscopy service, the death of a patient is not always known when notifications are issued. It made the point that this is particularly the case when a patient dies in another hospital or at home.

Mr Brown told my Office that it was never, at any stage, suggested to his wife or himself that his wife's condition was life threatening, or that she required hospital admission. He maintained that his wife's Lung Function Test (LFT) results transpired to be grossly abnormal. He was very unhappy that the results which were posted from the laboratory on the day of her test, were only seen by the Hospital consultant when his GP contacted the hospital, several days after his wife had died.

1.2 Complaint received by my Office

Mr Brown contacted my Office on 13 September 2005. He explained that he had been trying to get answers from Mayo General Hospital about his wife's death, for several months without success. He told me that he was not satisfied with the reason given to him for issuing the appointment card to his late wife to attend the Endoscopy Unit in April 2005, four months after her death. He made the point that it was his understanding that Dr Smith was investigating concerns about her death for the previous 4 months. He also confirmed that his wife did not die in another hospital as the Hospital had inferred, but in an ambulance on her way to Mayo General Hospital.

On receipt of the complaint in September 2005, my Office immediately sought a report on the matter from the Hospital.

1.3 Further HSE correspondence to Mrs Brown (RIP)

The HSE sent an "Application for Renewal of Medical Card" form to the late Mrs Brown, in November 2005. This "Renewal Application" was sent to the late Mrs Brown after Mr Brown had complained to the Consultant and to the Hospital, and after my Office had alerted the HSE to the complaint and sought a report on the issues presenting.

1.4 Response from Hospital to Mr Brown

On 23 December 2005, Mayo General Hospital wrote to Mr Brown. It informed him that the Pulmonary Function Laboratory at Merlin Park Hospital, Galway, issued its report on the day of the test and forwarded the results to Mayo General Hospital by ordinary post.

It explained that the test results were then placed in the "pigeonhole" for Dr Smith's team in the Medical Records' Department. Mr Ryan, the Hospital Manager, clarified that Dr Smith stated that he did not see the report until the following week, following enquiries from Dr Doyle, Mrs Brown's General Practitioner. Mayo General Hospital explained that the relevant administrative procedures for dealing with incoming test results were followed at the hospital.

The Hospital apologised that the system, in this instance, appeared to have let Mr Brown and his wife down, in that immediate follow up action was not taken, following receipt of the laboratory report. It said that its investigations indicated that the administrative procedures for dealing with test results were followed, both at the Pulmonary Function Laboratory in Galway and subsequently at Mayo General Hospital. Finally, it acknowledged that these procedures needed to be reviewed, to establish how it could ensure prompt follow up action, in all cases where results were abnormal.

2.0 Preliminary Examination

On receipt of the complaint, I sought a report, in September 2005, from the HSE - West. The HSE informed me on 30 December 2005 that Mrs Brown had presented to the Medical Assessment Unit in Mayo General Hospital in November 2004 with a history of shortness of breath and weight loss.

Dr Smith was on leave at the time and Mrs Brown was under the care of his Locum, Dr Charles and was seen by the Medical Registrar, Dr McKeon.

It was determined that, though unwell, Mrs Brown was stable on that date. She was referred for a Pulmonary Function Test (as an out-patient), which was performed at Merlin Park Hospital, Galway in December 2004. The HSE said that her test results were reported on the same day and posted to Dr Smith in Mayo General Hospital, Castlebar. The HSE stated that the date of receipt of the results in Mayo General Hospital was unknown, as they were not date stamped, but in its view, it was reasonable to assume that the test results were received in Castlebar the following day (a weekday).

The HSE said that Mrs Brown was referred as an out-patient for this test and was never referred to Merlin Park Hospital for admission or for respiratory consultation there.

The HSE explained that it appeared Dr Smith did not receive the report of the Lung Function Test until the following week, approximately one week after Mrs Brown's death. It also explained that the practice at Mayo General Hospital, is that reports are placed in the relevant Consultant's postal slot in the typing pool room for review and follow-up by the medical team concerned.

It said that, from a system review of this incident,

- the test was carried out
- the results were reported accurately and
- forwarded to the requesting consultant (placed in Consultant's postal slot).

The HSE acknowledged that, while the abnormal test result was highlighted in the report from the Laboratory, there was a system failure in that the results were not specifically brought to the attention of:-

- the Consultant,
- the GP or
- the patient

in a timely manner. It apologised for this oversight.

Finally, the Network Manager, on behalf of the HSE, explained that Mayo General Hospital would be asked to review its procedures in relation to better tracking systems and early warning systems, to ensure that critical information is relayed to the appropriate personnel, where reports indicate abnormal test results.

2.1 Hand-written Note on Test Result

A copy of the Lung Function Test Report was sent to me with the initial report from the HSE. Later, I sought a copy of Mayo General Hospital's patient file for Mrs Brown. This file contained a copy of the original Lung Function Test Report. When I compared the two Reports, I noted that the Test Report, on the hospital file, had a manuscript comment which was missing from the test report originally sent to me with the HSE's report.

The manuscript comment which was signed by Dr Murphy, Registrar in Merlin Park Hospital, Galway and missing from the original report sent to me stated:-*"Significant* decrease *in DLCO* consistent with restrictive lung disease. Compare with* Haemoglobin** and *patient's x ray chest."*
(*DLCO: Diffusion Lung Capacity Oxygen. This is a measure of how well gases (oxygen) move through the lung and into the bloodstream.
**Haemoglobin: This is the red pigment in blood cells that carries oxygen.)

I decided that the significance of the manuscript note and the significance of its omission from the record sent to the patient's GP required further attention, and although not included in the original complaint to me by Mr Brown, it was relevant for further examination by my Office.

3.0 Investigation

Given the serious issues which were presenting, I commenced an investigation into the complaint, under Section 4(2) of the Ombudsman Act 1980.

I wrote to the HSE on 6 July 2006 and set out the Statement of Complaint as follows:

- the results of a Lung Function Test, taken in December 2004, in Merlin Park Hospital, Galway were not conveyed immediately to the patient's Consultant, in Mayo General Hospital, even though the results showed gross abnormalities,
- when the results were received in Mayo General Hospital, they were not seen by the patient's Consultant, but simply placed in a designated "postal slot" for his attention, and
- the results were not brought to the Consultant's attention until after the patient's death.

The patient died 4 days later.

Subsequently,

- Mayo General Hospital sent an appointment letter to its former patient in April 2005, 4 months after she had passed away and
- even though an explanation and an apology was offered for the April 2005 incident, the Health Service Executive sent an "Application for Renewal of Medical Card" form to its former patient in October 2005, 10 months after she had died.

3.1 Response from Health Service Executive

On 22 August 2006 the HSE responded to the Statement of Complaint in the following terms:-

3.1.1 Handling of Diagnostic Reports

The HSE explained that the practice at Mayo General Hospital is that reports received are placed in the relevant Consultant's postal slot, in the typing pool room, for review and follow up by the medical team concerned. It clarified that clerical/secretarial staff are not expected to interpret the results, since clinical judgement is involved.

In this particular instance, the HSE advised me that it is not recorded or known when the Lung Function Test report was reviewed by Dr Smith or his medical team.

It pointed out that Dr Smith had stated that he did not personally receive the test result report until the week after the test was completed in December 2004, after Dr Doyle, Mrs Brown's GP, made enquiries.

The view of the Pulmonary Function Laboratory and Respiratory Physician, Dr Greene, in Merlin Park Hospital, was that, once the report was posted to the referring Consultant, their role was complete, since they do not "relate" the results of tests to patients.

With regard to the actions at Mayo General Hospital, the HSE pointed out that administrative procedures regarding incoming test results were followed, but their outcome depended critically on the consultant or medical team regularly reviewing the reports in their postal slots. The HSE told me that practice in this regard varied from Consultant to Consultant, team to team, and even, from time to time.

3.1.2 Action taken to Improve procedures

The HSE also explained that issues relating to the distribution, signing and filing of diagnostic test results have received considerable attention at Mayo General Hospital over recent years. In January 2006, it was agreed to carry out a one day audit of the documentation awaiting consultants' / teams' attention in the secretarial department / typing pool. The Medical Records Officer reported on the audit to the Hospital's Medical Records Users Committee, indicating that different pathways exist for the distribution of reports. Particular attention was given to problem areas as a result of this audit.

The HSE told me that the procedures for dealing with results from the Pulmonary Function Laboratory at Merlin Park Hospital had been strengthened. The reports are now clearly marked with the consultants name on a routine basis. They are opened at Mayo General Hospital by the relevant secretary and placed in the postal slot for the consultant's attention.

The HSE pointed out that in certain cases, the Pulmonary Function Laboratory also telephones the relevant secretary to flag that an urgent LFT result is being faxed to the consultant concerned. The secretary at Mayo General Hospital then contacts the consultant accordingly, to bring this to his/her attention.

The HSE said that the hospital procedures in Merlin Park Hospital, in relation to Lung Function Testing, have been reviewed by the relevant staff, including the Respiratory Consultant. A tracking system for test results is in place. In this particular case, the abnormal test results were brought to the attention of Dr Murphy who added the hand-written note. The results were issued immediately, rather than being batched and dispatched later, as would happen with results generally.

The HSE explained that the situation at Mayo General Hospital has improved significantly in practice, since the appointment of a consultant with an interest in respiratory medicine, from March 2004.

3.1.3 Follow up System for diagnostic results

The HSE further explained that measures were put in place on 1 September 2006 to implement a follow-up system for diagnostic results. This involves the Assistant Staff Officer in charge of the secretarial department, notifying the relevant consultant, when diagnostic results awaiting attention / signing are left for more than one working day in the postal slot. This is brought to the attention of the secretary to the consultant who contacts that consultant (or Registrar), accordingly. In the absence of a speedy response, the Medical Records Officer (MRO) is notified. The MRO pages/ phones the consultant involved to remind them of the situation. If this does not resolve the situation, the MRO informs the General Manager for appropriate follow up action.

The HSE told me that audits of the process will take place to establish whether the new measures are effective and to identify any problems that may exist in the system.

3.1.4 Notification of Hospital Appointments to Deceased Persons

In relation to the issue of hospital appointments being sent to deceased patients, the HSE said that deaths occurring in the hospital are recorded on the Hospital Information System. In the case of deaths occurring outside the Hospital, Mayo General Hospital generally depends on notification from the Public Health Nursing service. These notifications are entered on the Hospital Information System by an Assistant Staff Officer. Information is also received from relatives and entered on the system. To some degree, local knowledge is used, but this is on an *ad hoc* rather than on a structured basis.

The Hospital Information System flags the "RIP" status of the patient. Staff wishing to issue an appointment generally establish the patient's chart number from the Hospital Information System, based on details contained in the referral letter.

Where deaths are recorded on the Hospital Information System, the system tells staff that the patient is registered as an "RIP". In the event that they proceed to attempt to set up an appointment notification, staff are asked whether they wish to continue. In cases where hospital staff issue manually generated appointment letters, it is the expectation that they will check the system before doing so. The HSE admitted that this has not always happened, particularly in peripheral service areas and in situations where there is a lower level of clerical support.

The hospital mentioned that the whole issue of the management of waiting lists and appointments has been under review by a project team supported by an outside consultant.

3.1.5 Renewal of Medical Card.

The HSE says that Mayo Primary Community and Continuing Care Services are alerted to the death of Medical Card Holders in the following ways:

- Notifications from relatives.
- Notifications from field staff. e.g. Public Health Nurses & Community Welfare Officers.

- Notifications from hospital / Nursing homes.
- Notification from Deaths Births & Marriages Registration.
- Obituaries listings.
- Electronic data matching with Department of Social & Family Affairs.
- Notifications from relations when review forms are issued.
- Cancellations when review forms are not returned.

The HSE explained that, in this particular case, no notification or note of death was received until a review form for a medical card was issued in October 2005. It explained that the non-return of this review form resulted in the cancellation of the medical card in January 2006.

On a general point, the HSE pointed out that there are no complaints on record in its Community Services regarding the sending of correspondence to deceased medical card holders.

However, it accepted that, due to gaps in the reporting systems, difficulties in data matching and the dependence on regular staff with local knowledge, such events do occasionally occur. In this regard, the HSE advised me that there is a project underway to link the Medical Card number with the Personal Public Service Number (PPSN) to further improve the situation.

Given the serious, and apparently systemic, issues presenting, particularly

- the administrative procedures for handling the test results,
- the sending out of the appointment card after the death of Mrs Brown and
- the delay in responding to the initial letter of complaint,

my Office decided to interview the personnel directly involved in the case.

3.2 Interviews

As mentioned earlier, for the purposes of my Report,the complainant's name and that of his late wife have been changed to protect their identities. The names of the staff of the HSE, and others, have also been changed..

As part of the investigation, my staff interviewed the following individuals;

- Mr Brown, the complainant,
- Dr Greene, Consultant in Respiratory Medicine, Merlin Park Hospital, Galway,
- Dr Murphy, former Research Registrar, Merlin Park Hospital, Galway,
- Mrs Kelly, Senior Technician, Lung Function Test Unit, Merlin Park Hospital, Galway,
- Ms Byrne, Clerical Officer, Secretary to Dr Smith, Consultant Physician and Gastroenterologist, Mayo General Hospital, Castlebar
- Ms Butler, Clerical Officer, Secretary to Dr Mallen, Consultant, Mayo General Hospital, Castlebar,
- Dr Smith, Consultant Physician and Gastroenterologist, Mayo General Hospital, Castlebar.
- Dr Charles, Locum Consultant Physician, Mayo General Hospital, Castlebar
- Dr Doyle, Mrs Brown's General Practitioner.
- Mrs Moore, Personal Secretary to Dr Smith
- Mr Martin, Postman, Mayo General Hospital, Castlebar

3.2.1 Interview with Mr Brown

My investigator met with Mr Brown at his home. He explained that following the visit of he and his wife to Merlin Park Hospital, Galway in December 2004, he and his wife returned home. He said that his wife was in good spirits for a few days. She did her usual housework. She visited the town of Knock on Saturday to do some shopping. She bought some clothes and some holly for Christmas. She also took a bus to Swinford on her own. Neither had any idea about the serious state of her health. They simply carried on with their daily routine, as normal.

Mr Brown said that his wife went to bed early 4 nights later. It was about 8.15 pm - she had been doing this for the previous few weeks as she was tired. At about 8.50 pm she came running up the corridor and told her husband that she was feeling unwell. She said she needed oxygen. She was on her hands and knees and screaming.

Mr Brown rang Westdoc, which is the local out-of-hours GP service in the area. He was asked to bring her in, but he explained that he couldn't do this, as his wife was too distressed. The doctors came out to the house and put Mrs Brown on oxygen straight away. The ambulance came and the paramedics gave her an injection to calm her down. They carried her out on a stretcher to the ambulance.

At this stage Mr Brown still didn't think his wife was in any danger. He followed the ambulance out the road to Castlebar. However, after a while, the ambulance stopped in the middle of the road and he saw the paramedics performing Cardiopulmonary Resuscitation (CPR) on his wife. Mr Brown said that his wife passed away in the ambulance at about 11 pm. Her body was taken to Mayo General Hospital, where a post mortem was later carried out.

Mr Brown said that he and his daughters were totally misled about his wife's state of health. He said that neither he nor his wife were advised that she was seriously ill. He said that it seemed to him that the Clinic in Merlin Park Hospital, Galway, simply let her walk out of its offices on 1 December 2004 in the full knowledge that her medical

circumstances were very grave. He said that the seriousness of her condition was obvious from her physical state and the test results.

He said that he could not understand why nobody told them that his wife was seriously ill. He added that, when the test results were available, they were noted as abnormal, but they were simply put in the ordinary post and sent to Dr Smith, who never saw them, until it was too late.

Mr Brown felt there should have been some procedure or "red alert" way of notifying the doctors of his wife's condition, given the results of the Lung Function Test. He said that he was not advised when his Doctor would be told about the Lung Function Test results. However, given the results which were found, he said that he would have expected that the family Doctor would have been told immediately. He would have expected, based on his wife's abnormal test results, that the Hospital would have used a "Hot line" to alert the Doctors who were looking after her.

He felt that simply relying on the post is not the way to deal with a person's life. Mr Brown told me that he had trusted the medical people too much and he, his family and his wife, were let down.

3.2.2 Interview with Dr Greene, Consultant in Respiratory Medicine, Merlin Park Hospital, Galway

Dr Greene is the Consultant in Respiratory Medicine in Merlin Park Hospital, Galway with responsibility for the Pulmonary Function Laboratory. He did not see Mrs Brown. He explained that the late Mrs Brown visited the respiratory service in December 2004, some 4 days before her untimely death. He said that the locum Consultant's Registrar requested Pulmonary Function Testing in November 2004. The patient was given an appointment and duly attended. The tests were conducted by Mrs Kelly, Senior Respiratory Technician. He acknowledged that the test results were abnormal. Mrs Kelly had brought them to the attention of Dr Murphy, his Registrar. Dr Murphy wrote his comments on the Test Result report which Mrs Kelly dispatched by post to Dr Smith in Mayo General Hospital on the same day.

Dr Greene said that he was reluctant to comment on the "significance" of the abnormal results without possession of the other relevant clinical information, as his comments could be misconstrued or taken out of context. He pointed out that, as with all diagnostic testing, the more clinical background provided, the more appropriate and relevant is the subsequent interpretative report. Dr Greene explained that tests of lung function must be reviewed in the context of a

- patient's history,
- physical examination and
- other test results.

The Lung Function Test results are interpreted by Dr Greene or the Specialist Registrar in Respiratory Medicine and the final report then sent, by post, by the technical staff to the referring Consultant, as given on the request card.

Dr Greene explained that Lung Function Testing (see Appendix 1) assesses three main aspects of pulmonary function, namely:

- airway function,
- lung elasticity and
- gas exchange.

He said that the late Mrs Brown presented with a condition of breathlessness of un-stated duration. The request card mentioned

- a normal chest x-ray and
- a history of Raynaud's disease

He explained that the Lung Function Test results obtained in Mrs Brown's case, showed no evidence of an airway abnormality. The lung volumes were reduced. According to Dr Greene, the test results represented a restrictive defect, with severely impaired gas exchange. He said that he would expect a patient with such values to be breathless on exertion and there were indications of a primary lung abnormality being the cause of her breathlessness.

Dr Greene explained that Lung Function testing is an addition or complement to a diagnosis and treatment. The results must be correlated with the patient's history, clinical signs, radiology and other results.

He stressed that the referring clinician is best placed to offer an explanation to the patient on the test results. He pointed out that Lung Function Testing is not a "stand alone" entity and should not be viewed out of context (whether normal or abnormal values are obtained) and that the Lung Function Tests must be seen in the light of the clinical circumstances and other abnormal test results.

Dr Greene explained that the condition of patients with Mrs Brown's level of lung function would be very serious if it had developed over a short interval i.e. days rather than months. In Mrs Brown's case, the condition had evolved over the previous months. He clarified that, in lung disease, there is often a threshold effect i.e. the patient shows virtually no symptoms until 30-40% of the lung function has disappeared. He said that, while reflecting significant abnormality, he would not have predicted the subsequent outcome in Mrs Brown's case. He pointed out that her rate of decline certainly was unexpected.

In this regard, he emphasised that Mrs Brown walked in and walked out of the Pulmonary Function Laboratory and performed the tests without difficulty.

Internal Laboratory Procedures

Dr Greene reviewed the Laboratory's internal procedures in detail with his technical staff. He highlighted the following points:

- The present system evolved through ongoing reflection and review over the past 18 years while he has been there. Like other diagnostic laboratories in UCH and Merlin Park Hospital, the test result report is issued only to the referring clinician. No reports are given to the patient or sent to the GP.
- As with other diagnostic tests, the onus remains with the requester to have a robust system in place for the receipt and integration of normal and abnormal results.
- The Laboratory in Galway has a "tracking system" in place to monitor reports which are not received by the requesting party.
- The Laboratory in Galway, as part of its quality assurance programme, is now issuing reports on all test results.
- The Laboratory now stores a backup copy of the test graph numbers and the interpretative report.

In a report prepared by Dr Greene on the case and made available to my staff during his interview, he commented on a suggestion which had been made, that the Lung Function Test report should have been conveyed differently to Dr Smith. In this regard, he stated that

- It is unlikely that the abnormal lung function testing was the pivotal finding in this case.
- To relay abnormal reports, other than by paper, would impose a workload on the laboratory which would seriously hinder its capacity to deliver the present level of service.
- Currently the laboratory undertakes 5,500 procedures per year, of which at least 30% are abnormal.

- To the best of his knowledge, no equivalent laboratory in any of the Dublin teaching hospitals report except by paper - post.
- The laboratory will, of course, fax results if requested.

When probed whether Mayo General Hospital should have been alerted by phone or fax to bring these particular test results to the attention of Dr Smith or his team at an early date, particularly given the specific test results and Dr Murphy's manuscript note, Dr Greene clarified that test results are normally sent by post. He confirmed that they would be faxed back to the requester if the Laboratory was asked to do so. He pointed out that the results themselves do not determine the method of delivery to the requesting Consultant. However, he suggested that, given the issues presenting in this case, the HSE could do a Risk Assessment to determine how the Pulmonary Function Test Laboratory procedures are carried out and possibly come up with some improved procedures. In saying this, he said that Mrs Brown's Test Results did not fall into the emergency situation which would dictate urgent action.

3.2.3 Interview with Dr Murphy, former Research Registrar, Merlin Park Hospital, Galway (2003 to 2005).

Dr Murphy was the Research Registrar in Merlin Park Hospital, Galway, in the period 2003 to 2005.

Dr Murphy explained that the main task in the Pulmonary Function Test Unit was to conduct Lung Function tests, produce test results, and convey the results, with a commentary, to the patient's referring medical Consultant. He confirmed that the standard method of conveying results was by ordinary post.

He concurred with Dr Greene's view that, in Mrs Brown's case, the test results were significant in terms of her lung function. However, he clarified that he did not see the patient. In addition, he stated that one could not determine the patient's condition, simply by reference to the results of her Lung Function Test. He explained that there are different variables at play and any prognosis would be dependent on the patient's medical history and the nature of her illness. He pointed out that it is a matter for the patient's primary referring Consultant to determine the urgency of conducting the test and the urgency of receiving the test results.

Dr Murphy said that it is the normal practice to send test results by ordinary post . He explained that, if the patient was in good shape and stable enough when leaving the clinic after the test, which can be arduous enough, then sending the test results by post would be sufficient. However, he clarified that, if a patient deteriorated during the test, then the Laboratory would call ahead to the referring Consultant and alert him/her of the patient's condition.

He said that it was not the normal practice to ring ahead or fax the results to the referring Consultant, unless the Laboratory received a specific request from the referring Consultant, who, he said, would be best placed to know the patient's medical history.

3.2.4 Interview with Mrs Kelly, Senior Technician, Lung Function Test Unit, Merlin Park Hospital, Galway

Mrs Kelly has been a nurse in Galway for 30 years. She moved to Merlin Park, to a full time position in the Pulmonary Function Laboratory and has worked in this area for 18 years.

Mrs Kelly had no knowledge of the assessment which was carried out in Mayo General Hospital in November 2004, in the Medical Assessment Unit. Mrs Kelly explained that the referral form which she received, when the appointment was being requested, showed the consultant's name and the patient's name, date of birth, illnesses and symptoms.

Mrs Kelly carried out a Lung Function Test on Mrs Brown in December 2004, between 12.00 and 13.00. She recalls that the test probably took about 30 minutes. She said that Mrs Brown walked in to the Laboratory. She had been driven to Galway by her husband and he remained in the car park. Mrs Kelly

- took the patient's coat,
- asked her to remove her shoes and
- measured her weight and height.

She explained the details of the tests to the patient and advised her that, sometimes it might be necessary to take up to 10 tests to get the correct readings. She recalled that Mrs Brown was a petite woman, who was very quiet, but she did not appear to be breathless. She had Raynaud's Disease.

Mrs Kelly explained that her responsibility was mainly the patient's safety, to ensure the machines are calibrated correctly and that the results are correct. She said that once the test was carried out, the results were available immediately. The results were printed off for Dr Murphy's attention.

She noted that the results for the Spirometry were not too bad. However, she saw that the Diffusion test result was very poor. In fact, in her view, the Diffusion test results were grossly abnormal (See Appendix 1 for information on Spirometry and Diffusion).

She added however that it was very hard to tell exactly how abnormal the test results were. She explained that one would really have to have known the patient's history. One would need to know whether the patient was on a plateau, or whether she had deteriorated to this state rapidly. She explained that the worst situation would have been if there was a rapid deterioration. However, Mrs Kelly was not in a position to say how bad the patient's condition was, as she did not know Mrs Brown's medical history.

She showed the test results to Dr Murphy. He added a hand-written note to the results sheet and gave it back to her. She posted the document immediately to Dr Smith in Mayo General Hospital. The manuscript note stated as follows:

> *"Significant decrease in DLCO consistent with restrictive lung disease. Compare with Haemoglobin and patient's x ray chest."*

Mrs Kelly confirmed that the manuscript note was on the copy of the test results which were sent to Mayo General Hospital.

When asked whether, in her view, the test results were 'time sensitive' from the patient's perspective, Mrs Kelly agreed that she felt they were time sensitive and that this was the reason they were posted on to Dr Smith immediately.

Mrs Kelly said that she did not give any feedback to the patient. Mrs Brown did not ask any questions either. Furthermore, she did not give any instruction to Mrs Brown as to what she should do next. Mrs Brown would simply have been told that the Laboratory would send her test results to Dr Smith, her Consultant Physician in Mayo General Hospital.

Mrs Kelly pointed out that the Lung Function test results are only an adjunct to a diagnosis. She explained that one cannot make a diagnosis on the basis of Lung Function test results alone.

Having regard to the contents of the test results and the manuscript note, I enquired whether Mayo General Hospital should have been alerted by phone or fax that these results should be brought to the attention of Dr Smith, or his team, at an early date. In response, Mrs Kelly confirmed that the test results were not faxed, nor did she ring ahead advising Mayo General Hospital that she felt the test results were abnormal.

She explained that she has no clerical staff and that she was the only person in the office at the time. She said that, due to her workload, she simply had no time to go looking for a phone number or to try to find out who Dr Smith was, or where his offices were located. She pointed out that the Pulmonary Function Test Laboratory receives hundreds of requests for test results. However, if a fax number had been supplied, she confirmed that she would have replied by fax.

She also pointed out that, if she had been told that the results were needed urgently, she would have faxed or telephoned to let Mayo General Hospital know the test results were on the way. She stressed that she had not received such a request. She also confirmed that it was not her role to determine which test results are urgent or not.

When asked about the usual procedure for alerting a patient's consultant, in cases where the test results show abnormal readings, Mrs Kelly explained that

- tests are requested by the referring Consultant,
- tests are completed,
- the results are printed,
- the Respiratory Consultant sees the test results and usually
- writes a report on the Results sheet and
- these are then posted to Mayo General Hospital in Castlebar.

When asked about who is responsible for deciding on the form of transmission of test results to the patient's Consultant, e.g. by fax, email or phone alert, she explained that she presumed it was Dr Greene's responsibility, as Head of the Department, in urgent cases. She confirmed that, ordinarily, the technicians would post the test results to their destination.

Mrs Kelly repeated that she was responsible for posting the test results in this instance. They could have been faxed, but no fax number had been given to the Laboratory. In any event, she would not have the time to seek out a fax number for the Consultant involved. She had no clerical staff to do this and the Laboratory is extremely busy.

In conclusion, Mrs Kelly indicated that she would probably ring ahead if she was faced with a similar situation in the future, provided she had been given a contact number by the requester.

3.2.5 Interview with Ms Byrne, Clerical Officer, Secretary to Dr Smith, Consultant Physician and Gastroenterologist, Mayo General Hospital, Castlebar.

Ms Byrne started work at the Hospital in April 2002. She is a Clerical Officer and has been working in the Hospital's typing pool for 4.5 years. She trained in Filing Records before she was appointed as Secretary to Consultants O'Sullivan and Smith. She said that she does all the public work for Dr Smith.

Ms Byrne outlined the standard procedure in respect of the receipt of test results. She said that test results come in an envelope marked for the attention of a particular Consultant. They are placed in the Consultant's postal slot, which is located in the typing pool room on the ground floor, where they could be easily accessed. Each Consultant has a designated postal slot and, given the layout, it is visually obvious when post is backing up, or a large amount of post is awaiting the attention of a specific Consultant.

Ms Byrne said that it was not unusual for her to ring Dr Smith to tell him there was post waiting for him in his postal slot in the typing pool room. She said that she was pro-active in alerting him to the fact that post had been received for him.

I enquired as to whether the test results for public patients were processed in the same manner as those for private patients. In response, Ms Byrne explained that private patients are dealt with in Dr Smith's private clinic in Castlebar and all his post for his private patients goes to his private secretary and his private rooms.

I asked Ms Byrne if she had requested that the Pulmonary Function Laboratory in Galway alert her of the results in this case, immediately they came to hand. In reply, she explained that the Consultant is responsible for issuing all such instructions, including urgent cases. She confirmed that any urgent cases are referred back to the Hospital by fax. She also confirmed that, if the Consultant was not around, she would ring him to let him know that any predetermined urgent results had been received.

Ms Byrne confirmed that she would not be in a position to notice whether a test result was abnormal, or if a special note was added to it by a Consultant in Galway. She pointed out that it is not her place to study every report that comes in. In addition, as a Clerical Officer, she is not in a position to diagnose or interpret reports. Indeed she has no training in this regard and she would not have the authority to consider what was irregular or unusual.

When I enquired why Dr Smith only saw the test results some time after they were posted from the Laboratory, Ms Byrne advised me that this was explained by the fact that he didn't always come down to check his post and look for them. She explained that her practice was to ring consultants to advise them when post was in their postal slots awaiting their attention.

When asked whether Ms Byrne had a role in ensuring that test results do not linger in the Consultant's postal slot for any length of time, she explained that she can only ring a Consultant and advise him of the arrival of post.

Ms Byrne said that there was no way of establishing when Mrs Brown's test results were actually received in Mayo General Hospital, as they were not date-stamped on arrival. She confirmed that there is always a manuscript note on the test results which are received in Mayo General Hospital from the Pulmonary Function Laboratory in Galway. However, as she was on annual leave on the day the complainant's GP, Dr Doyle, rang making enquiries about Mrs Brown's Test Results, she did not actually see them on that day.

3.2.6 Interview with Ms Butler, Clerical Officer, Secretary to Dr Mallen, Consultant, Mayo General Hospital

Ms Butler was standing in for Ms Byrne as Dr Smith's Secretary in December 2004, the day Dr Doyle, Mrs Brown's GP, rang the Hospital seeking the test results for Mrs Brown. She is a Clerical Officer and Medical Secretary to Dr Mallen, Respiratory Consultant. She has held this position for 6 years.

She explained that a call came through from Dr Doyle. He told her that the patient had died four days earlier and he asked her about the LFT results. She found the Lung Function Test Results in the Typing Pool. She advised Dr Smith about the enquiry from Dr Doyle, Mrs Brown's death and showed him the LFT report. She advised Dr Smith that Dr Doyle had requested a copy of the LFT report and she asked Dr Smith if she could send it to Dr Doyle.

Ms Butler told me that Dr Smith told her to photocopy the report and to send it to Dr Doyle by fax, but not to include the manuscript note from Dr Murphy, which appeared at the bottom of the results sheet. On receiving this instruction, Ms Butler photocopied the report, with the manuscript part folded over, and then, once she got a copy of it, she faxed the copy, without the manuscript note, to Dr Doyle's Secretary.

3.2.7 Interview with Dr Smith, Consultant Physician and Gastroenterologist, Mayo General Hospital, Castlebar

Dr Smith said that he has worked in Castlebar General Hospital since 1993. He is a Consultant Physician and Gastroenterlogist. He has an average caseload of about 130 patients. He has about 30/40 in-patients and 50/60 out-patients. He discharges about 5 patients per day and admits 5 patients per day. About 10% to 12% of his patients are private patients, while the balance are public patients.

Dr Smith explained that he had never actually met Mrs Brown. He said that she was referred to the Medical Assessment Unit, in Mayo General Hospital. She was seen in November 2004, by Medical Registrar, Dr McKeon (he was the Registrar for Dr Smith's Locum Consultant, Dr Charles), who arranged an appointment for the Lung Function Test in Merlin Park Hospital, Galway. Dr McKeon also arranged for a Cardiac Test to be undertaken. The date scheduled for the Lung Function Test was arbitrary in the sense that it was a routine test and the date was set to tie in with the Merlin Park Hospital's schedule. The appointment made by the Cardiac Department was for December 2004. Dr McKeon scheduled a follow-up appointment in December 2004, four weeks after the first consultation, in the Medical Assessment Unit in Mayo General Hospital.

Dr Smith explained that there was no arrangement in place to date-stamp test results when they came in to the hospital. The only time they might be dated is when the Clinician

- reviews the results,
- acts upon them and
- signs off on them.

However, in July 2007, Dr Smith said that he directed his secretary to note the date of receipt on the envelope of all Lung Function Test results.

Dr Smith said that it was clear that Mrs Brown's particular test results came in to the typing pool room. He added that there could be hundreds of post items coming in every day in the general post.

He said that the test results may have been addressed to him, or they may have come in the general post. He explained that when a batch of posted items arrives, it is sorted by staff in the typing pool room and each item is put into the individual Consultant's postal slot in the designated area.

In commenting on an extract of the draft investigation report, Dr Smith said that it has always been his experience that there is a delay in the receipt of reports etc., particularly Lung Function Tests. He explained that there is often a time delay with this process. He mentioned that some blood test results from a weekly Medical Clinic, may not arrive in the relevant doctor's postal slot for two or three days after that Clinic. He drew my attention to his analysis of the exact time of arrival of Lung Function Tests since August 2007. This analysis indicates that test results arrive in his post 5 to 21 days after the tests have been carried out. He made the point that it has always been his impression that there are delays in the HSE internal post.

Dr Smith clarified that he would normally visit the typing pool to collect his post. However, the frequency of his visits would depend on how busy he was in his Clinic. He said that depending on circumstances, either he, or his Registrar, would call to the typing pool room two or three times per week. However, he acknowledged that on occasion it could be up to a week before he might review his post.

Dr Smith acknowledged that his secretary, in the typing pool, Ms Byrne would remind him if material for his attention was in his postal slot over an extended period. However, he admitted that he doesn't find the typing pool system very satisfactory and that he has brought this to the attention of management in the past. He explained that he has a private office in which he handles his private patients' work and some public patients' affairs, academic affairs and other office administrative duties. This private office is also used for interviews with staff and occasionally with patients.

In contrast, he explained that there are 12 secretaries serving 14 Consultants and about 46 Non Consultant Hospital Doctors (NCHDs) in the typing pool.

In commenting on an extract of the draft investigation report he described the typing pool as a confined space. He said that the only space available to the doctors in this room for doing paperwork is a nine-inch by twelve-foot ledge. He pointed out that there is no table for doctors and no central dictating facilities in this room. In addition, given its size, layout and number of occupants, he said there are continuous conversations going on in the room and accordingly there is no privacy. He said that, having regard to this, he finds it very difficult to concentrate and conduct business from the typing pool. Finally, he made the point that most consultants and their teams in the hospital do not use the typing pool for receipt of their post and administrative / secretarial activities. He explained that these activities are carried out in their offices or in a departmental office.

He said that he would become aware of abnormal test results in his postal slot simply by going through his post. He explained that in urgent cases, he would expect some type of flagging on the report when it arrives. In saying this, he stated that he was not convinced that the staff in the Pulmonary Function Laboratory in Galway could have known that Mrs Brown would die in 3/4 days.

Dr Smith confirmed that the first thing he knew about Mrs Brown's abnormal test results was when he got a call, via his Secretary, that Dr Doyle, Mrs Brown's GP, was making enquiries. He acknowledged that the test results might have gone unnoticed for a longer period, had he not received the phone call from Dr Doyle.

At a later stage in the investigation, when commenting on an extract of the draft investigation report, Dr Smith discussed with my Office how reports which are not specifically addressed to him would be sent to the typing pool, but reports and letters with his name on them would go to his personal office. This was relevant to the investigation, as he checks his post daily in his personal office, whereas he may not do so daily in the typing pool.

In light of these assertions, and in view of their conflict with evidence from other hospital sources, I again contacted the General Manager, Mayo General Hospital, and was told again that, at the time of the events in question, all post items, except those marked for Dr Smith's private office, were sent to the typing pool.

Given these different accounts, in an effort to seek further clarification on the matter, my staff interviewed Dr Smith's personal secretary and the hospital postman. An account of these interviews is provided later in this report. Notwithstanding these additional enquiries, I have been unable to date, to establish the definitive situation in relation to the issue of where test results addressed to Dr Smith are actually delivered and therefore reviewed.

Dr Smith described the test results as abnormal. However, he pointed out that there was no notion of the patient's immediate demise. He confirmed that there was no way his secretarial staff would have known that the test results, as reported, were abnormal. He accepted that only he himself or his Registrar would have known this.

In commenting on an extract of the draft investigation report, Dr Smith pointed out that approximately 15% of all results received are abnormal. He clarified that many laboratories use indicators on their reports, so that abnormalities are easily detected. He explained that, for instance, abnormalities may be printed in red or may have an asterisk beside the abnormal finding. He explained that, with this type of report, it is possible for non-clinical people to discriminate between reports.

Dr Smith accepted that he arranged for Mrs Brown's test results to be faxed to Dr Doyle, her GP, immediately, but with Dr Murphy's manuscript note deleted from the copy which was sent to Dr Doyle. He acknowledged that the manuscript note from Dr Murphy was an integral part of the overall report, but he was unable to recall why he had decided not to include the manuscript note from Dr Murphy, with the report. He said that he did not speak to Dr Doyle about the test results.

Dr Smith explained that, if he had seen the test results within a day or two of the test he would have checked out the patient's medical notes and would have noted that she was scheduled to have an appointment at the Out-Patients Department in two weeks time. In addition, he said that there was nothing in the report to suggest that the patient would have died within three days of the test.

He acknowledged that there was a fault in the system, and there was a delay in looking at the test results. However, he pointed out that he saw the test results two weeks after the LFT was carried out and that the patient was scheduled for an appointment in the Medical Assessment Unit in a few days later, i.e. four weeks from her earlier appointment in the Medical Assessment Unit. He said that the patient had been referred by her GP, to whom she had relatively easy access. Accordingly, he was reasonably satisfied that Mrs Brown was being monitored on a month by month basis which, in his view, was the appropriate timescale for monitoring a patient with Mrs Brown's medical history.

Dr Smith stressed that if someone sees a report on a person which might suggest that the patient might be dead in three days, then this should be acted upon immediately. However, in this particular instance, he repeated that these results were not such a report and did not suggest an imminent death. The receipt and analysis of the report, had it been assessed before the patient died, would not have changed the arrangements for a follow up appointment, which was scheduled for 4 weeks after her first attendance. Dr Smith felt that this was the back-up system in place in this instance.

He was concerned that Mrs Brown's family would think that her death resulted from the fact that the LFT report was not seen and acted upon, immediately the results became known. He did not share this view.

Dr Smith was asked why an appointment was sent to the late Mrs Brown for a Gastroscopy Test, after Mrs Brown's daughter had been in regular contact with him and his clinic following the death of her mother. The daughter had called during Christmas Week, on 8 January and in mid February 2005. Given the frequent contact with his Clinic, Dr Smith was asked to explain why an appointment letter was sent 4 months after Mrs Brown's death.

In reply, Dr Smith acknowledged that this was a very unfortunate occurrence and that it is the only instance where he can remember personally reviewing a deceased patient's notes and for this error to occur. He said that his office can be very busy and sometimes mistakes can happen. He admitted that his staff were preoccupied with other things and this got overlooked. He acknowledged that this type of error is unacceptable and he told my Office that he was sorry for his error in this instance. In saying this, he confirmed that it is a common enough happening for appointments to be sent to a deceased person.

3.2.8 Interview with Dr Charles, Locum Consultant, Mayo General Hospital.

Dr Charles explained that he did not actually see Mrs Brown when she called to Mayo General Hospital in November 2004, but that she was seen by the Medical Registrar, Dr McKeon.

However, Dr Charles examined the patient's file and confirmed that she had a number of tests carried out that day and, from an examination of the test results, he was satisfied that there was no significant indication that there was anything of significance showing up for the patient.

He pointed out that her Radiology report confirmed that the "Cardiac size and contour is normal" and that Mrs Brown's lungs were "over-inflated with increased markings in both bases, suggestive of COAD*". However, he stressed that the Radiology report stated that there was "no active lung disease identified."

* COAD: Chronic Obstructive Airway Disease.

3.2.9 Interview with Dr Doyle, Mrs Brown's General Practitioner

Dr Doyle said that Mrs Brown had been a patient of his for about 5 years. He explained that she suffered from a severe form of Raynaud's Disease and it affected her fingers and toes. Dr Doyle explained that Mrs Brown was in a lot of pain and her main reason for coming to his practice was to get some pain relief. He explained that she was on antibiotics and was also attending the Pain Clinic in Galway.

He pointed out that, in his letter of referral of 15 November 2004, to Mayo General Hospital, he sought Dr Smith's opinion on her condition. [*In commenting on an extract of the draft investigation report Dr Smith clarified that Dr Doyle referred Mrs Brown to the Medical Assessment Unit (MAU) with a letter to an unspecified doctor. He explained that this is usual procedure for general referrals to the MAU.]* Dr Doyle pointed out that Mrs Brown was complaining of dyspnoea* on exertion for the previous three weeks, with reduced exercise tolerance of approx. 200 yards. He mentioned that Mrs Brown also complained of weight loss of one stone over the previous four months. He clarified that there was a history of Raynaud's Disease affecting her fingers, causing her severe pain, for which she took very regular analgesia. Finally, he documented that her physical examination showed no obvious issues and her blood tests were normal.
*Dyspnoea: shortness of breath.

Dr Doyle said that the purpose of the referral to Mayo General Hospital in November 2004, was to try to get a diagnosis for her illness, which was provisionally thought by the Hospital to be Schleroderma** - Systemic sclerosis, and to allow him chart a plan of action for her future treatment. He confirmed that his referral was primarily based on her recent weight loss and her shortness of breath.

**Schleroderma: A systemic disorder of connective tissues with skin hardening and thickening, blood vessel abnormalities, and fibrotic degenerative changes in various body organs.

When my officials drew Dr Doyle's attention to the fact that Mrs Brown was due to be reviewed in Mayo General Hospital in December 2004, i.e. within one month of her initial examination, he confirmed that, in his experience, this would be normal practice. This, he explained, was on the basis that all test results would normally be back after a four-week period.

Dr Doyle explained that, a few days after Mrs Brown's death, he drove from his home in County Mayo to the Pulmonary Function Clinic in Galway, on his day off, to get a copy of the LFT Results from Dr Murphy and he discussed these with him. He said that the reason he drove to the Clinic in Galway was that, at the time, he felt there may have been a delay in getting the test results from Mayo General Hospital in Castlebar. In this regard, Dr Doyle pointed out that his medical practice has the facility to get test results electronically and he confirmed that he gets all his patients' blood test results electronically.

Finally, when asked why he had contacted Dr Smith's office in December, 10 days after the patient's death and requested Dr Smith's secretary to fax him the results, he said he could not recall this event.

3.2.10 Interview with Mrs Moore, Personal Secretary to Dr Smith, Consultant Physician and Gastroenterologist, Mayo General Hospital, Castlebar

Mrs Moore started work as Dr Smith's personal secretary on 22 January 2002. Prior to that she worked in England for 12 years. Her office is in Mayo General Hospital. Dr Smith has private rooms in the town, where he sees his private patients on Mondays. Mrs Moore works out of the private rooms on Mondays, when Dr Smith is seeing his private patients.

Her main job with Dr Smith is to look after his private patients. She also handles a lot of his correspondence in relation to other duties, for example, his academic work and organising presentations to other consultant teams. A lot of her time is spent on patient-related activities, as given Dr Smith's area of expertise, Gastroenterology, his patients need to be seen straight away. She deals with Dr Smith's private patients only. She does not deal with the private patients of any other consultant.

In relation to post items, Mrs Moore explained that any post for Dr Smith, with his name on the envelope, comes to her, whether marked private or not. She said that she opens all his post, except that marked as "private and confidential". She does not date-stamp the post when it arrives.

She explained that, originally, when she took up duty in January 2002, Dr Smith opened his own post. At that time, his post, along with the post for other consultants, went to the Consultants' Rest Room. Dr Smith's post was collected by him from the Consultants' Rest Room. After about 2 or 3 months i.e. March / April 2002, Mrs Moore started to open Dr Smith's post and an arrangement was introduced that Dr Smith's post i.e. those envelopes with Dr Smith's name on it, was directed straight to Mrs Moore. (The arrangement for delivering post to the Consultant's Rest Room was terminated shortly afterwards and the post was routed through the Typing Pool.)

When asked to explain how the Lung Function Test for Mrs Brown ended up in the postal slot in the typing pool, she said that she could not explain how that happened. She emphasised that nearly 100% of post with Dr Smith's name on it, would come to her.

When asked to clarify what items of post are placed in the postal slot in the typing pool. Mrs Moore explained that any charts that Dr Smith would ask for and any letters which his public secretary would type up for him, are placed there for later collection by Dr Smith or his Registrar.

She explained that all Lung Function Test reports would be sent to her office, as they are marked for Dr Smith's attention. This was the case for both private and public patients. She clarified that she would have no reason or cause to visit the typing pool at any stage. She pointed out that, when she goes on holidays, she asks the postman, Mr Martin, to drop Dr Smith's post directly in to Dr Smith.

When asked, Mrs Moore explained that, given her experience, she knows how to recognise bad or poor test results. She confirmed that she did not see the Lung Function Test results for Mrs Brown when they arrived in the hospital. She said that the particular results must have gone astray.

She said that, if she had opened the envelope with Mrs Brown's LFT results, she would have recognised that they were abnormal. She said that she would have telephoned Dr Smith and advised him of the contents of same and her concerns.

Mrs Moore was asked if anyone in the typing pool would ring her if they had concerns that post or other items were building up in Dr Smith's postal slot. In response, she confirmed that more recently Dr Smith's public secretary in the typing pool would ring advising that there were letters or items awaiting signature. She said that, in those cases, his public secretary would ring Dr Smith directly, as she has a direct reporting line to Dr Smith.

In relation to date stamping post items, Mrs Moore confirmed that she has a "date stamper" but that she doesn't use it. She said that, in future, she probably will use it.

Mrs Moore emphasised that there is no difference in the treatment of post items in respect of private and public patients. She said that, regardless of whether the correspondence was in respect of a public or a private patient, once Dr Smith's name is on the envelope, it would come straight to her. She again confirmed that this was the case from 2 or 3 months after she took up duty in January 2002.

In relation to the issue of pre-alerts, Mrs Moore explained that if Dr Smith was worried about a particular case, and if it involved a private patient, he would ask her to look out for the results. She said that she has a general overview of all Dr Smith's private patients, as she gets to meet all of them in his rooms in Castlebar every Monday.

3.2.11 Interview with Mr Martin, Postman, Mayo General Hospital, Castlebar

Mr Martin's main job is to deal with the hospital's post, a position he has held for over 11 years.

He explained that the volume of post received per day is substantial. Some post also arrives by courier. Inter-hospital post from Mayo General Hospital is sent in a taxi each day, (Monday to Friday) to Merlin Park Hospital, Galway and to University College Hospital, Galway. The taxi then returns from each of these two hospitals with post for Mayo General Hospital. The taxi arrives back in Mayo General Hospital between 3 and 3.30pm, each day

He said that any post which is specifically addressed to a doctor, goes straight to that doctor. He does not open letters or any post which has a doctor's name on it. He confirmed that this has always been the procedure. He said, however, that originally, all post went to the Consultants' Post room - Rest Room - but that this procedure was changed in 2003 . He now leaves the Consultants' post wherever the particular Consultants requests him to leave it.

He said that all post which is addressed to Dr Smith goes directly to Mrs Moore, Dr Smith's personal secretary,except for those letters which are marked "appointments", which go to the Medical Registrar.

Mr Martin stated that, originally, he would leave post in the typing pool for Dr Smith, but that, once Mrs Moore became Dr Smith's personal secretary, he was asked to give all post, which was marked for Dr Smith's attention, to Mrs Moore. He pointed out that there is a different arrangement for other Consultants. His general approach is to leave the post wherever he is asked to by the Consultant, in order to suit the particular Consultant's wishes and requirements.

He explained that he also leaves post in the postal slot in the typing pool. He stated that it is up to the particular consultants to take the post out of their own assigned postal slot.

When asked to explain what happens to post items which are for Dr Smith - but where this is not apparent from the envelope - Mr Martin explained that it would go to the Hospital Manager's secretary, for her to decide and for her to re-direct it to its intended destination.

Mr Martin stated that since 2004, no post with Dr Smith's name on it would have gone to the postal slot in the typing pool.

When asked if it was possible that any post items could have gone to Mrs Moore's office and then have been referred back to the typing pool where they might then have been put in the postal slot, Mr Martin said that this was not possible. He said that, if any post item was referred to Mrs Moore by him in error, she would re-direct it back to him for re-checking, if that was the case.

4.0 Analysis

This case has many elements which require attention, some of which are more significant than others, but they are all related in some way. Some elements relate, in the broadest sense, to the care of Mrs Brown, and others relate to non-care issues such as the handling of Mr Brown's complaint and the notification of appointments. Whilst the first elements are most significant in some ways, the latter ones are, nonetheless, relevant in the context of this complaint and thus I have afforded them significant attention also.

4.1 Clinical judgement and the clinical consequences of maladministration

As Ombudsman, I cannot examine actions taken by persons when acting on behalf of the HSE and which, in my opinion, are taken solely in the exercise of clinical judgement in connection with the diagnosis of illness or the care or treatment of a patient. I can and do however, look at administrative actions taken in the course of clinical work which do not involve clinical judgement.

As Ombudsman, my role is to determine whether maladministration causing adverse effect has occurred. In this case, it was clear that the family of Mrs Brown suffered significant distress arising from a number of incidents and events described in this report. What I was unable to determine, based on the evidence of those who were interviewed in this investigation, was whether any of these incidents or events could have contributed to the death of Mrs Brown. I therefore decided, having interviewed all relevant parties in this case and having had time to consider the evidence available, that it was necessary to seek independent, expert clinical advice on whether certain elements of the alleged maladministration, i.e. the failure to act on the results of medical tests, contributed to the death of Mrs Brown. In deciding to seek an independent assessment of this matter, I had two principal concerns in mind. First, from the perspective of the complainant and his family, it was important to satisfy their concerns about this matter. Second, from my perspective, I was concerned that my investigation should attempt to clarify the full extent of the adverse effect of the maladministration in this case. In doing so, I am not scrutinising the clinical judgement of any party to this investigation, rather, I am

formulating a view, based on expert opinion, on the clinical consequences of a series of administrative actions and inactions.

Expert, independent clinical advice made available to me by a Consultant in Respiratory Medicine has suggested that whilst a little more could perhaps be done in the future to speed up the diagnosis of Pulmonary Hypertension (Mrs Brown's ultimate cause of death), there would have been no reason to expect Mrs Brown's sudden, catastrophic and tragic death. Further testing, which would have been indicated following the receipt of the laboratory results, would most likely have been scheduled for a date beyond the date on which she had suddenly died. This clinical advice therefore suggests, that in this instance, the maladministration which occurred did not lead to Mrs Brown's death. However, I am clear that if the system failures highlighted in this report remain, they could in the future lead to significant adverse affect to patients and as such they need to be addressed.

4.2 Communication of test results

The request form (see Appendix 2) sent from Mayo General Hospital to the Laboratory in Merlin Park Galway, requesting it to undertake a Lung Function Test on Mrs Brown, contained the following details:

- Mrs Brown's Name,
- Her Address,
- Her Hospital Number,
- Age of patient,
- Consultant's Name,
- Date,
- Clinical Details of patient,
- Examinations Required.

It also indicated that the patient could walk and stand.

There was no telephone contact number or no fax contact number included on the request form. In addition, there was no indication on the request form as to whether the test results were urgent or whether they should be relayed back to the referring Consultant, other than in the routine manner, by post.

It was standard practice in the Pulmonary Function Laboratory to send test results by post. The Laboratory does not see itself as having an initiating role in alerting a referring doctor to a potential problem with a patient. It takes the view that the onus is on the referring doctor to advise the Laboratory where he/she considers that

- the proposed test is urgent and
- the test results should be relayed back to the referring doctor urgently.

In this particular case, even though the results had been noted as abnormal, the view was taken that, as the requesting physician did not request urgent delivery of the test results, there was no urgency attached to them and it was appropriate to send them in the ordinary post, rather than by fax or email, or to alert the requesting physician by phone. The Laboratory did, however, decide not to batch them with other post and potentially delay their transmission, but to post them separately to Dr Smith.

I fully accept that Mayo General Hospital did not consider that the Lung Function Test referral was anything other than a routine referral and that, accordingly, there was no need to include a request for an urgent response in respect of the results. Equally, I can understand that, in the absence of any instruction about the need for an urgent response, the process through which the results were returned to Mayo General Hospital, was in keeping with standard practice. In this case, the Senior Technician, Mrs Kelly, having consulted with the Registrar, acknowledged that the results were abnormal and decided to post them separately, rather than batching them. However, whilst I understand that the primary role of the Laboratory is to complete tests and report them back, I believe that inter-agency collaboration is required to agree a standard for the delivery and receipt / review or actioning of test results. The Laboratory should play a role in working with those agencies and Consultants that it provides a service to, to agree best practice in this

regard. This would assist in eliminating risks and preventing results from getting lost between reporting and referral sources.

I understand systems of critical reporting have been developed in many laboratories and hospitals, which involve highlighting the abnormal or critical test result and ensuring it is brought to the prompt attention of a doctor.

Such a system / protocol might have significant and timely benefits for many patients, although I accept that in this case the result by itself, while significant, was not critical.

The principle underlying all of the actions of healthcare providers is that the health and welfare of patients are of paramount importance and I am satisfied that this view is shared by all of the medical and administrative staff involved in this case. However, I am not so confident that the communications systems in place fully contribute to achieving the highest standard of patient care. The Laboratory in Galway told me that in the future they might fax through abnormal results. In this regard, I acknowledge that Dr Greene, Consultant in Respiratory Medicine, was of the view that, while the test results were abnormal, he would not have predicted the patient's imminent demise. This opinion was supported by my independent clinical advice, but I remain dissatisfied that a system existed which allowed important test results to remain unattended to for 10 days and potentially longer.

I appreciate that in the absence of the full particulars of a patient's medical history, it would be difficult to assess the circumstances in which it might be deemed that test results should be fast-tracked to the referring authority. However, I consider that at the very least, a fax number, telephone number, landline or mobile, and email address of the referring consultant and his/her secretary, should be included in the referral documentation. The test request form should indicate the perceived urgency for the test to be completed in the first place, but also any urgency regarding communication of the results. More particularly, the use of communications technology should be considered to ensure that test results are made available almost instantaneously to those directly involved in the provision of care and treatment to patients.

4.3 Receipt of test results in Mayo General Hospital

The Pulmonary Function Test Laboratory in Galway sent the test results by internal or inter-hospital post to Dr Smith in Mayo General Hospital within a 24 hour period of a date in December 2004. As no alert was raised by the laboratory before conveying the results to Mayo General Hospital, it is reasonable to assume that the administrative personnel receiving the results would have dealt with them according to standard procedure.

We know that the results somehow were placed in the Consultant's postal slot, but not acted upon.

In the course of the investigation of this complaint, the arrangements for delivery and opening / review of post by consultants, were discussed in detail with Hospital Management, Administration staff and Dr Smith. Dr Smith advised me that reports which are *not* specifically addressed to him, would be sent to the typing pool and that letters and reports specifically addressed to him, would be sent directly to his personal secretary. This contradicted what was said by Hospital Management. This is an important detail, as the investigation showed that post in Dr Smith's private office was opened daily, whereas post in the typing pool was opened less regularly.

The expert clinical advice made available to me has also raised the issue of whether there are any corporate governance issues, for example, issues of confidentiality, with regard to a staff member employed privately by a Hospital Consultant, dealing with information pertaining to public patients. While I have not explored this matter in the course of this Investigation, I believe that this is something that may require attention by Hospital management.

Given the different accounts of the system for receiving test results, my staff interviewed additional staff and sought further clarification from Hospital Management. Notwithstanding these additional enquiries, I have been unable, to date, to establish exactly what arrangements were in place for the delivery and opening of public post for Dr Smith. All I can say for certain, is that in this particular case, the results of Mrs

Brown's tests were ultimately found in the postal slot in the typing pool, where it is accepted that Dr Smith did not have arrangements in place for post to be opened daily.

In this specific instance, it has been established that neither Dr Smith, nor any member of his team, sought or received the results until 10 days after the patient's death in December 2004. In this regard, Dr Smith has accepted that the test results might have remained unattended in his postal slot in the typing pool for a longer period if Dr Doyle, the patient's GP, had not telephoned making enquiries about the test results.

This practice is simply not acceptable. While it is not absolutely clear in this case why test results were not seen for some time after they were posted from the laboratory, it is apparent that there was some significant failure in the system which had that effect. The conflicting description of how test results were delivered and received, further highlights weaknesses in a critically important hospital system.

Having reviewed the procedures then in place for dealing with incoming post, it strikes me that they were deficient, particularly in the context of dealing with test results which were described, at different times, as 'grossly abnormal', abnormal, significant and/or time-critical. I note that this view is shared by management at Mayo General Hospital. These important results were addressed to Dr Smith and delivered by regular post; despite confusion about where they should have been delivered, they ultimately arrived in the Dr Smith's postal slot; but no action was taken until the GP phoned 10 days after the patient had died to enquire about them.

It is clear that improvements need to be put in place, in the light of the experience in this instance, in order to ensure that abnormal results or time-critical information is

- efficiently relayed to the appropriate medical personnel
- reviewed
- acted upon appropriately.

It is not acceptable, in any circumstances, that abnormal results or time-sensitive, patient-specific information, should languish in a Consultant's postal slot for periods of up to two weeks and possibly more.

4.4 The missing manuscript note on the Lung Function Test report

The matter of the missing manuscript note did not form part of the original complaint, but was an action discovered in the course of my investigation which I was concerned with and which I believed required attention. No reasonable explanation has been offered to me as to why the full test result report was not sent to the patient's GP, when he originally requested a copy.

Dr Smith could not recall the reasons why he might have asked for Dr Murphy's manuscript note not to be included with the test results, which were sent to Dr Doyle, the patient's GP. The purpose of Dr Murphy's note was to provide specialist advice to relevant persons on the interpretation of the numerical results. Removing this note had the potential to make the results less meaningful to someone not specialising in respiratory medicine.

The test results, which form part of the patient's medical record, and which were made available from Dr Smith's Clinic to Mrs Brown's GP, were incomplete and, as such, it could be said that her GP and family were denied access to information, to which they were rightfully entitled. Dr Doyle was a key person in this case. He had referred Mrs Brown to the hospital in the first instance and it was he who had caused the test results, posted some 10 days earlier, to be brought to the attention of Dr Smith. As such, he had a right to seek and receive Mrs Brown's test results in full.

A complete and reliable medical record is one whose contents can be trusted as a full and accurate representation of the facts to which they attest. This record can be depended upon in the analysis and assessment of a patient's medical circumstances. In this particular instance, the test results which were sent to the patient's GP, could not be deemed to have met this standard.

My investigation identified that Dr Doyle perceived there was a delay in getting the Lung Function Test results from Dr Smith's Clinic in Castlebar and hence took it upon himself, on his day off shortly after Mrs Brown's death, to drive from his home in County

Mayo to Galway to get the results personally. He also discussed them with Dr Murphy. These test results contained the manuscript note from Dr Murphy indicating an abnormal result. It is unclear why, having already personally received a hard copy of the results from Galway, Dr Doyle's office, days later, also contacted Dr Smith's office, seeking a copy of the results. Despite enquiries I have been unable to clarify why this occurred.

4.5 Appointment letter for Endoscopy Unit

Dr Smith has acknowledged that the appointment letter for the Endoscopy Test should not have issued to the patient, four months after her death. He has suggested that this was an oversight by the clinic and that his staff were preoccupied with other issues at the time.

However, in this particular case, it is clear that the patient's family had been in regular contact with Dr Smith and his Clinic in the period December 2004 to mid February 2005.

They had always been assured that

- their mother's case was being examined,
- issues were being pursued and
- Dr Smith would be in contact with them in relation to their mother's case.

Therefore, the impression given was that the late Mrs Brown's case was to the forefront of the mind of certain people in Dr Smith's office. However, this impression was slowly and definitively undermined as time went by and the family did not get any meaningful responses from the office. This perceived sense of indifference and apathy was further compounded when the family received an appointment letter for their mother to attend the Endoscopy Unit, four months after her death. The general impression created by this action was that the Clinic was disinterested in the family's situation and that it did not comprehend or empathise with their ongoing grief.

4.6 Reminder Notification for Medical Card.

On 7 November 2005, Mrs Brown was sent a letter from the Health Service Executive,West, requesting that she renew her Medical Card. This was 11 months after she had died. This notification was clearly sent in error and the family was understandably upset by the incident.

When I raised the matter with the Health Service Executive, it explained how the error had occurred and it indicated that a project is currently underway to link the Medical Card number with the Personal Public Service Number (PPSN), to improve the situation. The HSE apologised again for the oversight.

This was a very unfortunate and indefensible occurrence. It is very difficult to understand how it could have happened, given that Mrs Brown had died while being transported to Mayo General Hospital in a HSE ambulance and was later brought to the Hospital for a post mortem. The HSE's contact with her on her tragic death should have ensured that her death would have been recorded in the Hospital Information System.

It is to be hoped that the HSE's proposals for tackling this issue, once implemented, will ensure that other families will not experience a similar situation.

The transfer of Mrs Brown's incomplete medical record to her GP after her death and the issuing of the appointment letter and medical card renewal notification, all served to exacerbate the Brown family's grief over the loss of a wife and mother who clearly was deeply loved.

These errors arose as a consequence of poor administration and require existing procedures to be reviewed so as to ensure that similar events cannot happen again. If looked at outside the context of this case, these administrative errors would be regrettable, but in the context of the hospital's commitment to examine a complaint about the sudden death of a 53-year-old woman, these errors highlight a serious deficiency in the examination of the Brown complaint.

5.0 Findings

The Lung Function Test

5.1 The results of a Lung Function Test completed in December, 2004, in Merlin Park Hospital, Galway, which were acknowledged, at various stages, to be either significant, abnormal or grossly abnormal were not seen by the patient's Consultant, in Mayo General Hospital, until 2 weeks later, 10 days after the patient had died. Even then, they were only seen due to a request from the patient's GP. This was an unacceptable delay. There was a serious deficiency in the administrative standards and procedures for reviewing incoming post in the typing pool.

5.2 The internal communication systems in Mayo General Hospital were inadequate in that the test results, although abnormal, were not seen by the Consultant, or the patient's General Practitioner, in a timely manner.

5.3 There is a conflict of evidence relating to the procedures in December 2004 for the receipt of incoming test results from the Pulmonary Function Laboratory in Merlin Park Hospital, Galway, to Dr Smith, Mayo General Hospital. On the one hand, the Hospital management and Dr Smith's public secretary have stated that incoming test results for Dr Smith's public patients were delivered to the typing pool where they were placed in his postal slot. On the other hand, Dr Smith, his personal secretary and the hospital postman have stated that any post addressed to Dr Smith was delivered to his private rooms, where it was checked daily. I have been unable to resolve this conflict of evidence. However, in the present case, it is established beyond doubt that the test results were, for whatever reason, deposited in the postal slot of Dr Smith in the typing pool.

The fact that such conflicting descriptions should present, about what should be a simple process of delivering and reviewing important patient related information, is totally unacceptable and highlights a system requiring urgent attention. In addition, in the interests of proper hospital governance, the matter of information relating to public patients being received by private staff of a hospital consultant, requires attention.

5.4 The policy of the Pulmonary Function Laboratory in Merlin Park Hospital, Galway, is to automatically send test results by ordinary post, unless the requesting physician stipulates an alternative method of delivery. This system needs to be reviewed in association with referring agencies to ensure best practice across the continuum of test completion, reporting, delivery and medical review.

5.5 The form which was used to request the Lung Function Test, (designed by University College Hospital, Galway) did not contain a provision for the inclusion of a telephone contact number or a fax contact number of the Doctor requesting the Test. This contributed to a further serious weakness in the general communication systems relating to test results in Mayo General Hospital.

Missing Manuscript Note

5.6 It was inappropriate for Dr Smith, following a request from the patient's GP for a copy of the test results, to omit an integral part of the results from the copy which was sent to the patient's GP. This note was an important part of the record; it was written to assist non-respiratory experts to understand the detailed numerical results. As such, its removal could reduce the meaning of the results for the patient's GP, a key person in Mrs Brown's care.

Implications for Health and Welfare of Patients

5.7 The system used for communicating results of tests employed in this instance, had serious risk implications for the health and welfare of patients.

In this particular case, independent, expert clinical advice made available to me has suggested that Mrs Brown's death was not caused by the administrative failings outlined elsewhere in this report. However, I consider that the administrative failings could create serious risk for other patients in the future and thus must be dealt with as a matter of urgency. In addition, the presence of such administrative failings caused a grieving family to question whether the sudden and traumatic death of their loved one could have been prevented if matters had been dealt with differently.

Hospital Information System

5.8 The patient died in an ambulance on her way to Mayo General Hospital. However, this death was not recorded on the Hospital's Information System at the time, or immediately afterwards. Subsequently, a post mortem was carried out in Mayo General Hospital, but again this was not recorded on the Hospital's Information System. This represents a serious weakness in the Hospital's records management systems. A formal complaint was also being examined about Mrs Brown's death by the hospital, and yet this did not prompt capture of Mrs Brown's death on the system either. This simple failure to record the patient's death, resulted in two insensitive letters issuing to the patient's family in the following 11 months, one with regard to an appointment for an endoscopy, the other with regard to renewal of a medical card.

Examination of the Brown family's complaint

5.9 There was an unacceptable delay by Dr Smith and the Hospital in dealing with the Brown family's concerns following the death of Mrs Brown. Mr Brown's daughter initially contacted Dr Smith's office in December 2004, and in the absence of a definitive response to this enquiry, Mr Brown wrote to Mayo General Hospital in April 2005. The Hospital issued a written response on 23 December 2005, more than one year after the family's initial complaint to Dr Smith and eight months after they had written to the Hospital.

6. Recommendations

I recommend that

6.1 Mayo General Hospital and the Respiratory Function Laboratory in Merlin Park Hospital, Galway, complete a comprehensive review of the system for requesting and reporting all respiratory tests (including Lung Function Tests). This should incorporate a risk assessment of current procedures with a view to establishing a process which would ensure that:-

6.1.1—Tests are requested in the most efficient manner possible; contact details of the referring doctor are included, to allow urgent contact by the laboratory to be made if required; and there is a facility for the referrer to indicate the priority / urgency of any given test.

6.1.2— All results are reported as efficiently as possible, and in particular, abnormal results are identified and communicated to the referring consultant and/ or medical team, in a manner that is appropriate to their significance.

6.1.3 The consultant and / or medical team demonstrate that they have received the results and acted on them as appropriate.

6.1.4—Test results (given the concerns I have expressed in paragraphs 4.4 and 5.6 of this report) which are requested and/ or appropriate for the GP's attention, are provided in their entirety to the GP, in a timely manner. Specialist clinical opinion attached to the results and provided to describe the test result, should always accompany the results themselves.

6.1.5 The feasibility of using communication technology is explored to achieve all of the above, but in particular, the instantaneous delivery of results to those directly involved in the care of the patient.

6.1.6 There is regular audit of the system for requesting and reporting tests.

6.2 Mayo General Hospital complete a comprehensive assessment and review of the arrangements by all clinical staff in relation to how post, which may contain patient related information, is actively managed.

6.2.1 Procedures should be in place to ensure that post, which may contain critical patient related information, is date stamped on receipt, opened daily and acted upon as appropriate.

6.2.2 In light of the conflicting presentations at paragraph 5.3 of this report about arrangements for the receipt on incoming patient-related post, Management at Mayo General Hospital should, in consultation with Dr Smith, immediately take appropriate measures to ensure that there is absolute clarity over the approved arrangements for receiving, disseminating and acting upon such post.

6.2.3 When duties and responsibilities of staff employed privately by consultants include the completion of work relating to public patients, these practices should be reviewed, to ensure clarity about the role of such staff across the hospital system and appropriate governance relating to confidentiality of public patient records etc.

6.3 Mayo General Hospital review its data capture techniques and procedures to ensure that all patient deaths are entered to the Hospital's Information System. These should include:- deaths which occur in the Hospital, deaths which occur in transit to the Hospital via ambulance and all remains which are presented to the Hospital.

6.4 In conjunction with 6.3 above, to avoid unnecessary distress to grieving family members, Mayo General Hospital should review its procedures and put measures in place to ensure that

- no appointments are scheduled and
- no appointment cards are issued

in respect of deceased patients.

6.5 In conjunction with 6.3 above, the HSE should continue to review its procedures and put measures in place for renewing Medical Cards, to ensure that no renewal notifications are issued in respect of deceased persons.

6.6 The HSE should

- review the current complaint handling procedures in Mayo General Hospital to ensure that they are consistent with the Health Act 2004 (Complaints) Regulations, 2006 (S.I. No. 652 of 2006), particularly Article 8 which

stipulates, among other issues, the timeframe within which a complaint should be investigated and completed.

- ensure that Mayo General Hospital makes freely available information on making a complaint and the complaint handling process. This should include publication of its complaint examination procedures on its website.

- monitor annually the compliance of Mayo General Hospital's complaint examination procedures with the governing regulations and the HSE's own complaint handling performance indicators.

I also recommend that

6.7 The findings of this investigation be drawn to the attention of all staff involved with the care of the late Mrs Brown at Mayo General Hospital and Merlin Park Hospital, Galway, in the period November to December 2004.

6.8 A member (or members) of the senior management team in Mayo General Hospital visit the Brown family to apologise, once again, for the shortcomings identified in this report and to explain what action is being taken on foot of the findings and recommendations contained in the report.

6.9 The HSE ensures that the National Director of Clinical Care and all public and voluntary hospitals be made aware of the clinical governance and corporate governance issues in this investigation and the recommendations for systemic improvements.

6.10 The HSE makes a "Time and Trouble" ex-gratia payment, on a without prejudice basis, in the sum of €5,000, to the Brown family, in recognition of the effort expended by them in the pursuit of their complaint and the unacceptable delay in the examination of their complaint.

Emily O'Reilly

Ombudsman

Appendix 1

Lung Function Test

Diagnosis

A doctor usually can tell whether a person has a lung or airway disorder based on the medical history and physical examination. Diagnostic procedures are used to confirm the diagnosis, determine the extent and severity of the disease, and help in planning treatment.

Medical History and Physical Examination

A doctor first asks the person about symptoms.

Next, the doctor asks the person about past infections; previous exposure to chemicals; use of drugs, alcohol, and tobacco; home and work environments; travels; and recreational activities. A doctor also asks the person about whether family members have had lung or airway disease and any other diseases that may affect the lungs or airways.

During the physical examination, a doctor notes the person's weight and overall appearance. The person's general mood and feeling of well-being, which also may be affected by lung or airway disease, are also noted. A doctor may ask a person to walk around or climb a flight of stairs to see if either activity causes shortness of breath.

Assessing skin colour is important because pallor or cyanosis may indicate anaemia or poor blood flow. These findings can indicate that the skin is receiving inadequate oxygen from the blood because of lung or airway disease. Fingers are examined for evidence of clubbing.

A doctor observes the chest to determine if the breathing rate and movements are normal. By tapping (percussing) the chest, a doctor can determine if the lungs are filled with air, which is normal, or if they contain fluid, which is abnormal. Using a stethoscope, a doctor also listens to the breath sounds to determine whether airflow is normal or obstructed and whether the lungs contain fluid as a result of respiratory failure or pneumonia.

In addition to examination of the chest, a complete physical examination may be needed, because many disorders not related to the lungs first present with evidence of lung problems.

Lung Function Tests

Lung function tests evaluate how well your lungs work. The tests determine how much air your lungs can hold, how quickly you can move air in and out of your lungs, and how well your lungs add oxygen and remove carbon dioxide from your blood. The tests can diagnose lung diseases and measure the severity of lung problems.

Spirometry is the first lung function test done. It measures how much and how quickly you can move air out of your lungs. For this test, you breathe into a mouthpiece attached to a recording device (spirometer). The information collected by the spirometer may be printed out on a chart called a spirogram.

Gas diffusion tests

Gas diffusion tests measure the amount of oxygen and other gases that cross the lungs' air sacs (alveoli) per minute. These tests evaluate how well gases are being absorbed into your blood from your lungs.

Gas diffusion tests include:

- Arterial blood gases, which determine the amount of oxygen and carbon dioxide in your bloodstream.
- Carbon monoxide diffusing capacity (also called transfer factor, or TF), which measures how well your lungs transfer a small amount of carbon monoxide (CO) into the blood.

Two different methods are used for this test. If the single-breath or breath-holding method is used, you will take a breath of air containing a very small amount of carbon monoxide from a container while measurements are taken.

In the steady-state method, you will breathe air containing a very small amount of carbon monoxide from a container.

The amount of carbon monoxide in your arterial blood is then measured. Diffusing capacity provides an estimate of how well a gas is able to move from your lungs into your blood.

Lung function results are measured directly in some tests and are calculated in others. No single test can determine all of the lung function values, so more than one type of test may be done. Some of the tests may be repeated after you inhale medication that enlarges your airways.

Lung function tests are done to:

- Determine the cause of breathing problems.
- Diagnose certain lung diseases, such as asthma or chronic obstructive pulmonary disease (COPD).
- Evaluate a person's lung function before surgery.
- Monitor the lung function of a person who is regularly exposed to substances such as asbestos or radon that can damage the lungs.
- Monitor the effectiveness of treatment for lung diseases.

How It Is Done

Lung function tests are usually done in special exam rooms that have all of the lung function measuring devices. The test is usually done by a specially trained respiratory therapist or technician. For most of the lung function tests, a patient will wear a nose clip to make sure that no air passes in or out of the nose during the test. The patient is then be asked to breathe into a mouthpiece connected to a recording device.

The accuracy of the tests depends on the patient's ability to follow all of the instructions. The therapist may strongly encourage the patient to breathe deeply during some of the tests to get the best results.

The testing may take from 5 to 30 minutes, depending upon how many tests are done.

Risks

Lung function tests present little or no risk to a healthy person.

Results

Lung function tests evaluate how well your lungs work. The normal value ranges for lung function tests will be adjusted for the patient's age, height, sex, and sometimes weight and race. Results are often expressed in terms of a percentage of the expected value.