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National E-Health Transition Authority

Environment Scan

The Pathology Industry

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Final

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Preface

Document purpose

The purpose of this document is to describe:

- the current and foreseeable future state of the Request-Test-Report cycle of the Australian pathology industry; and
- the various clinical business problems within the Request-Test-Report cycle which could be solved through utilisation of enhanced e-health standards and infrastructure nationally.

The document also provides a recommendation of the clinical business problems which should form part of NEHTA's e-Diagnostics program of work for July 2009 - Jun 2012.

Intended audience

The intended audience of this document includes:

- Pathology industry stakeholders (refer section 4.1);
- NEHTA management and staff involved in the consideration of the feasibility of individual deliverables of the e-Diagnostics program of work; and
- NEHTA business analysts wanting to become familiar with the problem scope of the program of work pertaining to the pathology industry.

Consultation

This document has been developed in consultation with a range of pathology industry stakeholders and through input provided at pathology industry agenda-setting events. It has been validated via a review by selected stakeholders prior to being published.

Definitions, acronyms and abbreviations

The document author has endeavoured to keep acronyms and professional terminology (medical, legal, IT or otherwise) at a level which ensures the document can be understood by a broad audience, whilst maintaining a readable flow.

Details of definitions, acronyms and abbreviations used within this document are contained within the Definitions section at the end of the document, on page 29.

Referenced documents

This document references a number of artefacts which are of relevance to the current and foreseeable future environment of the pathology industry. These artefacts may include published reports and papers, website material, meeting minutes, responses to questionnaires, notes from interviews and conversations with stakeholders which have been produced by NEHTA or external organisations and individuals. Some of these artefacts may not be freely available in the public domain.

Details of the documents referenced within this document are contained within the References section of this document, on page 30.

1 Executive Overview

Pathology provider organisations, both public and private, have well established business and system processes for the electronic storage and communication of pathology information. Despite the high utilisation of electronic solutions and related standards, there is still considerable variability in file structures and terminology code sets – not just between providers, but between the various laboratories operated by a single provider. While there is considerable advantage to be gained by the entire health care industry in further increasing the utilisation of standardised code sets, messaging structures and protocols, the associated costs are considerable. Pathology providers have demonstrated a keen interest in furthering the secure exchange of reliable pathology information between health care providers; the challenge now is to get requesters on board, too, finding incentives for them to embrace electronic Requesting as standard business practice.

A number of opportunities for better patient outcomes and improvements in quality and safety were identified during the execution of this environment scan. It is recommended that assessments of the opportunities associated with the development of e-health solutions for a number of problem areas, as follows, should be performed:

- Electronic pathology Requests;
- Alerting a requester that an abnormal/clinically significant Result has been reported which requires their action, including an escalation process for such alerts which have not been acknowledged;
- The automated reconciliation of Result Reports with Requests within clinical systems;
- Tracking of the status of individual tests within a Request by the requester as they move through the Request-Test-Report cycle; and
- Decision Support tools for requesters of pathology testing.

While numerous clinical business problems relating to the notification of pathology information to clinical registries have been identified, it is acknowledged that this environment scan afforded only a one-sided view of these problems. It is clear that further consultation with various clinical registries and other stakeholders is required in order to develop a more complete understanding of the current problems within the end-to-end business process. It is, therefore, recommended that the notification of pathology information to clinical registries should be the focus of a separate environment scan.

The final recommendation of this environment scan is that NEHTA work with the Department of Health and Ageing (DoHA) and other stakeholders to facilitate the delivery of adoption incentives and support mechanisms to assist pathology providers and requesters with their e-Pathology journeys.

This environment scan document will be presented to the Diagnostic Services Reference Group for endorsement of the recommended actions as input to the e-Diagnostics program of work for the period to June 2012.

2 Introduction

2.1 Background

“Pathology is the branch of medicine which is involved in understanding the cause and processes of disease. It does this by looking at changes in the tissues of the body and in blood and other body fluids. Some of these changes show the causes, while others reflect the severity of the disease and are used to follow the effects of treatment.” [RCPA2009]. “It is the diagnostic skills of pathologists and their laboratory-based scientific colleagues that allow patients to know if they are pregnant, anaemic, diabetic, at risk of heart disease or if their lump is cancerous.” [MLA2008]

Pathology covers a range of specialities and sub-specialities which change over time. Currently, the Royal College of Pathologists of Australasia describes nine major areas of activity, as follows:

- *Anatomical Pathology*, which deals with the tissue diagnosis of disease;
- *Chemical Pathology*, which encompasses the detection of changes in substances (such as electrolytes, enzymes and proteins) in blood and body fluids and the detection and measurement of tumour (cancer) markers, hormones, poisons, drugs, etc;
- *Clinical Pathology*, which covers the major aspects of the clinical branches of laboratory medicine (i.e. chemical pathology, microbiology, haematology and blood banking, but does not cover anatomical pathology);
- *Forensic Pathology*, which involves identifying the cause of death and reconstructing the circumstances by which the death occurred;
- *Genetics*, which involves the microscopic analysis of chromosomal abnormalities (clinical cytogenetics) and uses the tools of DNA technology to analyse mutations in genes (molecular genetics);
- *Haematology*, which deals with aspects of diseases that affect the blood (such as anaemia, leukaemia, lymphoma, and clotting or bleeding disorders) and blood transfusion services;
- *Immunopathology*, which is concerned with the immune system;

- *Microbiology*, which deals with diseases caused by infectious agents such as bacteria, viruses, fungi and parasites; and
- *General Pathology*, which spans the major aspects of all branches. A general pathologist would consult with more specialised colleagues for problems demanding specific expertise [RCPA2009].

Pathology testing activities may be performed in centralised laboratories, specialised units, or in clinical “near patient” facilities.

In 2006/07 Medicare provided a total of \$11.7 billion in benefits, of which \$1,742 million, or 14.8 per cent, was paid for 87.5 million pathology services (including 26 million items associated with the collection of specimens) [AIHW2008b, MED12007]. It is estimated that in 2008/09 pathology providers will derive revenue from Medicare of \$2,155 million for the provision of 101.5 million pathology services [IBIS2009]. Note that Medicare is only one of the funding and delivery mechanisms for pathology services by governments and others in Australia. Therefore, it provides only a partial picture of the sectors nature, size and activities.

Other mechanisms are Australian Health Care Agreements which are cost shared by Australian and state/territory governments, workers’ compensation and accident schemes as well as those paid by individuals, businesses etc. Patients may move across these schemes. There is no reliable data on the overall size of the sector with Medicare data giving only an indicator. Moreover, Medicare activity on number of services and transactions will understate actual activity given the various episode coning and other rules that affect payment under the Pathology Services Table (PST) [NCOP2009].

The major referral-base for pathology providers is medical practices, which account for an estimated 70 per cent of revenue. In 2007/08 Medicare rebates accounted for 92.7 per cent of revenue from Medicare services, with the remaining 7.3 per cent of revenue funded from patient co-contributions. Growth markets that are not funded by government (e.g. through Medicare) include occupational tests, sports drug tests and clinical trial tests [IBIS2009].

IBISWorld estimates that pathology provider revenue has grown at an average annualised real rate of 3 per cent in the five years to 2008/09, coming mainly from an increase in the number of pathology services provided (averaging 6.6 per cent per year).

Currently, Medicare benefits are only payable to the provider which is nominated by the requester when a Request is issued; if a patient wishes to utilise a particular provider they must negotiate this with their clinician beforehand. However, as part of the 09/10 budget it was announced that changes to legislation will be introduced from 11/12 which allow patients to choose any provider for their pathology testing, irrespective of the provider which is nominated by their clinician on a pathology Request form.

The distribution of pathology testing across specialities is indicated in Table 1.

Activity Area	Medicare Benefits (\$ Million)	Medicare Benefits (% of Total)	Percentage Growth in Y/E 07/08	No. of Services (million)	No. of Services (% of total)
Chemical	700.2	37.3	10.8	33.4	34.8
Patient Episode initiation*	329.2	17.5	7.2	29.8	31.1
Microbiology	255.3	13.6	6.2	9.6	10.0
Haematology	235.1	12.5	4.1	14.6	15.3
Tissue Pathology	198.1	10.6	5.5	2.3	2.4
Immunology	75.3	4.0	8.6	2.4	2.5
Cytopathology	42.2	2.2	1.6	2.0	2.0
Cytogenetics	20.5	1.1	11.2	0.1	0.1
Infertility and Pregnancy Tests	9.6	0.5	3.8	0.5	0.5
Simple Basic tests	4.6	0.2	-5.4	0.6	0.7
Specimen Referred	3.8	0.2	13.6	0.4	0.4
Management of bulk billed services	1.9	0.1	1.2	0.0	0.0
Total	1875.8	100.0	7.7	95.8	100.0

Table 1: Value of Medicare Benefits Paid and No. of Medicare Services Processed for Pathology Groups in 2007/08 (current prices). Source: [IBIS2009]

** Patient Episode initiation is a Medicare item covering pathology providers' overheads.*

The population catchment required for a sustainable pathology practice is 50,000, although a small laboratory providing limited on-site services could be sustained for a population of ten thousand [AMWA2003]. In 2005 there were 1.3 pathologists per 100,000 population in outer regional areas compared with 5.6 per 100,000 population in major cities [AIHW2008c]. This undersupply of pathologists for rural areas is likely to be further exacerbated by growing workforce shortages.

The supply of pathology services by State and Territory is consistent with the geographic and age distributions of the Australian population. In 2007/08, 35.3 per cent of total pathology services were provided in New South Wales, 24.3 per cent in Victoria, and 19.5 per cent in Queensland [IBIS2009].

Typical information flows in pathology are illustrated in diagram 1.

2.2 Scope

The scope of this environment scan is restricted to the Request Test Report cycle for pathology Requests from registered healthcare providers (either individuals or organisations) for tests to be performed by any accredited public or private pathology laboratory in Australia. This includes inter laboratory referrals of one or more of the tests within a Request.

Note that the following are specifically excluded from the scope of this environment scan:

- Billing and payment of pathology tests; and
- Non-human pathology testing.

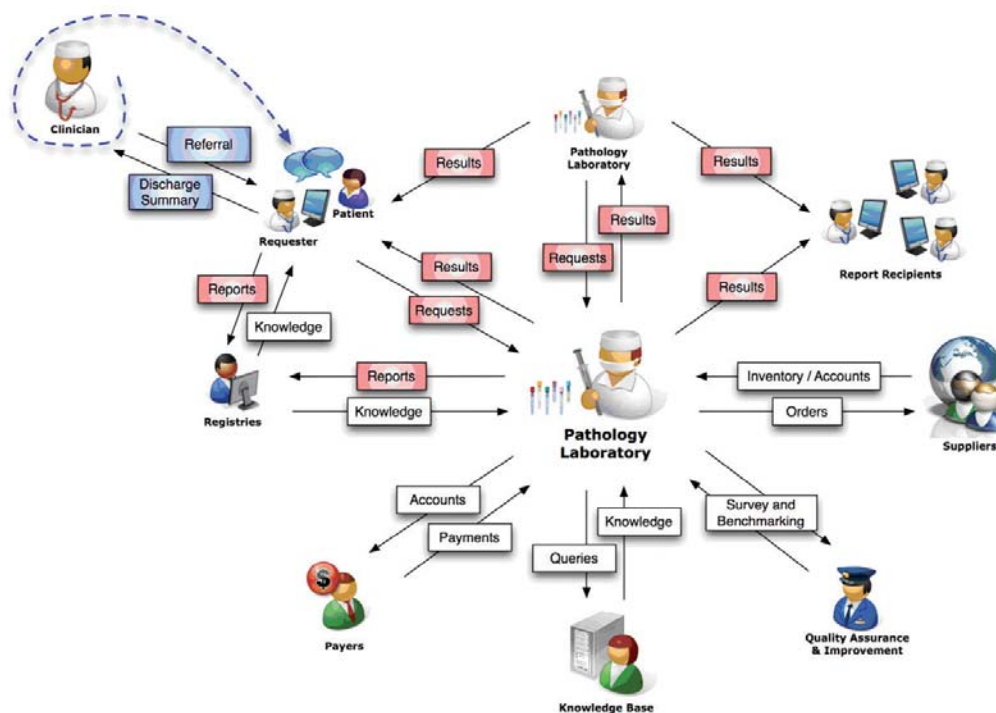


Diagram 1 – Pathology information flows

The main flows are between primary pathology laboratories and requesters. The information flows shaded pink form part of NEHTA's e-Diagnostics program of work. The information flows shaded blue from part of NEHTA's Continuity of Care program of work.

2.3 Approach

This environment scan was undertaken using an adaptation of the PEST analysis methodology to consider the **P**olitical (governance), **E**conomic (revenue and transaction volumes), **S**ociological (influences of demand) and **T**echnological (information exchange) factors which define and influence the Australian pathology industry today and in the foreseeable future. Factors associated with accreditation of pathology laboratories were also considered.

This environment scan considers data arising from a variety of sources, including research of papers and other artefacts which are already in the public domain and meetings with individual stakeholders.

Additionally, NEHTA convened three workshops with pathology industry stakeholders to discuss the pathology Request Test Report cycle and the current and potential barriers to uptake of e Pathology from the perspectives of:

1. Requesters of pathology testing;
2. Providers of pathology testing; and
3. Pathology industry informatics community and software vendors.

Consultation with patients and carers was achieved via a series of consumer focus groups, which were convened in late 2008 by a market research company on behalf of NEHTA, and by direct engagement with the Consumers Health Forum.

3 The Pathology Industry

3.1 Current state

Australia is recognised internationally for the quality of its pathology services [NPAA2007] and our laboratories are among the most efficient in the world [MLA2007]. However, there are concerns that these high standards may not be sustained due to the workforce shortage in pathology, particularly for pathologists, laboratory scientists and technicians and health informaticians, which is being experienced internationally.

A 2007 workshop convened by the Pathology Section in the Diagnostics and Technology Branch of the Department of Health and Ageing, in conjunction with The Quality Use of Pathology Committee, the National Pathology Accreditation Advisory Council and the Royal College of Pathologists of Australasia, to discuss patient safety and quality in Australian pathology identified the following key issues, in order of priority:

1. *Workforce* (incorporating pathologists; scientists; informaticians; education; support services; and substitution);
2. *Smart Requesting* (incorporating pathologist discretion; opportunistic testing; reflex testing; electronic Requests; decision support; variation in pathology utilisation; further identification of sources of variation; standardisation; and terminology);
3. *Positive Identification* (incorporating identification of a patient, requester, report recipient, pathology provider and sample);
4. *Testing outside the current Quality Framework* (incorporating point-of-care testing within a hospital, shop, General Practice or pharmacy; esoteric and specialised testing; alternate testing; and self-testing); and
5. *Smart Reporting* (incorporating agreed protocols for urgent Results; closure of the report-receipt loop; terminology; integrated advice/guidelines; to all relevant report recipients; public health; shared Electronic Health Record – nationwide access to pathology Results). [MLA2007]

3.2 Potential future state

3.2.1 Vision

The aim of NEHTA's e-Diagnostics Program is to work with the pathology and diagnostic imaging sectors of the Australian healthcare environment to develop and implement the standards, specifications and supporting material required to achieve relevant outcomes outlined in the National E-Health Strategy and in NEHTA's mission. In addition to this, the program aims to address barriers to the uptake of e-health standards, specifications and supporting material as a matter of priority.

Through NEHTA's consultation with stakeholders it is evident that all pathology professionals and industry stakeholders have an interest in advancing the secure exchange of reliable and meaningful pathology Request and Result information between healthcare providers. However, an understanding of and appreciation for the opportunities for quality, safety and improved patient outcomes which are enabled by the secure exchange of reliable and meaningful pathology information is less clear.

Whilst the e-Pathology vision must be "owned" by pathology professionals and the industry, it is recommended that NEHTA works with stakeholders to facilitate articulation of the e-Pathology vision for the next two-to-five years and five-to-ten years, which is endorsed by key stakeholders, as a matter of priority. An endorsed e-Pathology vision will facilitate development of high level business requirements which provide direct input to NEHTA's program of work.

3.2.2 Roadmap

Rather than communicate their own roadmaps for development of processes and systems with NEHTA, pathology stakeholders have made it clear that they want NEHTA to communicate the roadmap of e-health deliverables, from which they will develop their own roadmaps. The specific areas stakeholders require the roadmap to incorporate include:

- The specific items being delivered, including commentary about what each item is, how it is used and what it will enable;
- A specific and guaranteed delivery date for each deliverable;
- Adoption drivers and incentives;
- Support tools and mechanisms, including how they are used or accessed;
- Details of the roles and responsibilities of NEHTA and external parties in the development and implementation of each deliverable;
- Terminology; and
- A pathway for adoption of e-Pathology deliverables.

In March 2009 the Australian Association of Pathology Practices Inc (AAPP), the National Coalition of Public Pathology (NCOPP), the Royal College of Pathologists of Australasia (RCPA) and NEHTA signed a national consensus statement, agreeing to work together to design and develop a roadmap for the adoption of national e-health standards and specifications and to cooperate on the implementation of e-health standards and specifications.

The roadmap of e-health deliverables will be developed collaboratively with stakeholders during the period Jul - Dec 2009 and will be endorsed by the Diagnostic Services Reference Group prior to publication.

4 Analysis

4.1 Stakeholders

The pathology Request-Test-Report cycle refers to:

- the initiation of a request (most commonly by a Physician or General Practitioner for the purpose of patient diagnosis or management);
- the informed cooperation of the patient (at a minimum, for the collection of the specimen being tested);
- the performance of the requested pathology services by a pathologist and/or pathology provider; and
- the reporting of the test results and/or professional opinion(s) back to the Requester or their nominated delegate (refer diagram 2).

A single Request-Test-Report cycle for a patient may involve a number of medical and non-medical health professionals, health institutions and commercial organisations [RCPA2007].

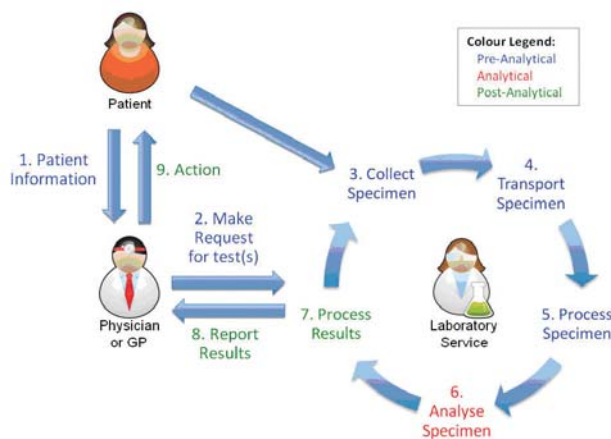


Diagram 2 – The Pathology Request-Test-Report Cycle

Stakeholders of the pathology industry are described below.

4.1.1 Patients and carers

It is widely accepted that the majority of decisions affecting diagnosis or treatment involve a pathology investigation, with 17.4 per cent of all patient encounters with a GP resulting in a Request for at least one pathology test [AIHW2008d].

Currently, Medicare benefits are only payable to the provider which is nominated by the requester when a Request is issued; if a patient wishes to utilise a particular provider they must negotiate this with their clinician beforehand. However, as part of the 09/10 budget it was announced that changes to legislation will be introduced from 11/12 which allow patients to choose any provider for their pathology testing, irrespective of the provider which is nominated by their clinician on a pathology Request form. Note that Medicare benefits are not payable for pathology tests which were not initiated by a registered healthcare provider.

Patients are directly involved at the beginning and end of the Request-Test-Report cycle (refer diagram 2). From the patient's perspective, the current process is working well, however, some concerns have been articulated [UMR2008]:

- The out-of-pocket costs associated with a request for pathology testing can be an important factor for the informed decision of a patient to follow a clinician's recommendation to have the test(s), however these costs are usually unknown until after a test has been completed;
- It can be disconcerting that collection centre staff sometimes need to refer to a manual in front of the patient in order to determine the appropriate method for collection of a specimen [UMR2008].

Other concerns articulated by the Consumers Health Forum include:

- Patients are not always notified that the Result of some tests, along with some of their personal information, will be reported to a clinical registry, with options and processes for opting-in and/or -out of individual clinical registries are sometimes unclear; and
- Patient-friendly information regarding the nature of the pathology test(s) being performed, including pre-test requirements (e.g. fasting), is not always made available to the patient.

4.1.2 Requesters of pathology testing

The requesters of pathology tests are general practitioners, medical specialists resident medical officers, locums and nursing staff in hospitals, nurse practitioners out of hospitals (including midwives), infection control practitioners, dentists, medical officers in insurance companies, occupational health and environmental scientists.

The rate of pathology test ordering by General Practitioners (GPs) has increased by 44 per cent between 2000/01 and 2007/08, from 30 tests per 100 encounters to 43.2 [AIHW2008a, AIHW2008d]. Approximately 40 per cent of pathology testing in the Australian primary care setting is used for diagnostic purposes, 40 per cent for monitoring and 20 per cent for preventative purposes [NCOP2008].

Factors influencing the demand for pathology testing services include:

- Advances in science and technology, which can increase the range of available diagnostic services. There is growing demand for genetically-based tests;
- The 'out-of-pocket' expense for the patient;
- Demographic factors – for example, people over the age of 65 use, on average, more medical services than younger people, with an accompanying higher rate of pathology testing; demand for various kinds of pre-natal tests is determined largely by the childbirth rate;

- Increases in the number of tests ordered by doctors. GPs are ordering more precautionary tests, in part due to the increasing threat of litigation and an increase in the types of tests available;
- The emergence of new health problems (e.g. new sexually transmitted diseases); the prevalence of epidemics of particular diseases; and growth in the public's understanding of health problems; and
- Alternative technologies. New diagnostic products can allow testing by doctors and/or patients without the need for a pathology laboratory [IBIS2009].

There are no accurate figures for the number of pathology Requests which are never completed because the patient does not turn up for specimen collection, however it is believed to be between 10 and 20 per cent of all pathology Requests issued.. During a review of the Standards for general practices (2nd Edition), the Royal Australian College of General Practitioners (RACGP) commissioned a legal opinion on the issue of the follow-up of tests and results. While practices are not expected to follow up every test ordered, there is some uncertainty regarding medico-legal liabilities if a patient for whom a pathology Request has been issued does not present for collection of the relevant specimen(s), the clinician has not followed this up with the patient or their carer and the patient subsequently experiences an adverse event which is relevant to the unprocessed pathology Request [RACG2007].

Closure of the Request-Test-Report cycle is therefore very important from the requester's perspective, however this process is complicated by a number of issues including:

- Lack of common unique identifiers for patients;
- A requester has no visibility of whether a patient has presented for specimen collection;
- A requester has no visibility of the progress of one or more of the tests within a Request within a provider's testing process;
- A Result Report does not reference a unique identifier(s) for the request(s) to which it relates;

- Result statuses are not defined or used consistently across pathology providers, resulting in uncertainty about when a result is ‘final’; and
- It can be difficult to identify when results have been received for all of the tests within a Request as the tests referenced in the corresponding Result Report(s) may not resemble those on the Request due to:
 - Multiple providers might be involved with the reporting of results associated with a single Request (i.e. where the nominated provider has referred one or more of the tests within a Request to another provider);
 - Cancellation and/or replacement of one or more tests by the provider; and
 - The use of different names for tests and sets of tests by providers and requesters [NEHT2009].
- There is no consistency in the way abnormal Results are reported by providers, with some using colour-coding (e.g. abnormal Results displayed in red) and other using ‘+’, ‘++’ etc. As a result, clinicians who are familiar with the report format/layout of one provider may inadvertently overlook key information when presented with another provider’s report;
- There is some uncertainty about the meaning of normal/abnormal ranges and how they should be used to interpret a result;
- It is not always clear who has responsibility for notification of communicable diseases to the relevant authority (i.e. the requester or the provider) and when the notification should be issued (i.e. on suspicion of disease, or confirmation of Result, or both);
- Identifying the individual who has responsibility for determining the appropriate course of action with regard to patient follow-up in relation to a Result Report, and identifying whether this responsibility has been fulfilled; and
- It is difficult to change the priority of a Request once it has entered a provider’s testing process [NEHT2009].

Other issues of concern for requesters include:

- There is no generic mechanism for sending Requests or receiving Result Reports electronically – currently clinicians are required to use different software for each provider;
- Clinical notes are often condensed or omitted during data entry of a Request in a provider’s system;
- It is not possible for a requester to flag that the Result of a test needs to be reviewed by a pathologist with a particular speciality prior to reporting the Result (for example, a patient with a myelodysplastic syndrome would need to have their blood film manually examined, as the automated machine processes may indicate the film is normal);
- It is not possible to include in a Request any additional (separate) clinical notes which are for the information of one or more of the ‘copy to’ recipients;
- At times a requester may be uncertain about the most effective test(s) for confirming a particular diagnosis or for monitoring a particular disease and access to such information is not always readily available;

4.1.3 Providers of pathology testing services

Providers of pathology testing services include the public and private organisations which provide pathology testing services within Australia and the specialist pathologists, medical scientists, health informaticians, medical technicians, laboratory assistants, collectors and nurses, pathology couriers and the clerical, operational and IT staff who they employ.

Hospital-based and large private laboratories operate 24 hours per day and are supported by a network of specimen collection centres and a sophisticated logistics network for transport of specimens between healthcare facilities (including general practice), collection centres and laboratories.

Some industry players maintain that increasing competition from public hospital laboratories will pose a challenge to private operators and issues of competitive neutrality will need to be addressed in relation to this competition [IBIS2008]. Similarly, public providers are nervous of the ambition of private providers to be able to compete for public pathology contracts, with a number of the public providers with whom NEHTA has consulted and collaborated advising that they are unwilling to have any information regarding their revenue or throughput published as part of this environment scan.

In consultation with industry it has been estimated that upward of 70 per cent of pathology Result Reports are transmitted electronically, with providers keen to bring that number closer to 100 per cent to maximise financial and customer service efficiencies. In contrast, most pathology Requests are manual (paper based), although some providers have indicated that up to ten per cent of Requests are now received electronically.

There is no agreed minimum data set for a pathology Request, therefore key information, including medication details, gender and date of birth, are often omitted from the 'completed' Request form [NEHT2009]. An investigation into the reasons for incorrect or incomplete pathology Request forms at a major teaching hospital in Sydney found that the average error rate was 30 per cent, with clinical and medication details and the requester's ID and contact details accounting for 31.7 per cent and 25.8 per cent of these errors respectively, and only six per cent of Request forms were fully completed [RNSH2008]. Note that it was determined that the findings of this study were likely to be applicable to other hospitals, but not necessarily directly applicable to the private pathology sector, although many of the problems and their causes do occur in this area.

Pathology providers have articulated the following issues regarding Requests for pathology testing:

- Handwritten Requests are sometimes illegible;
- The burden of data entry of manual Requests lies with the provider;
- A Request may use the patient's preferred name rather than that recorded by the provider or Medicare, and their address and contact number may be missing or incorrect; and
- Preferences by requesters for one provider's user interface over another can result in the production of electronic Requests which will never be completed. For example, a requester will use provider A's interface to produce a Request which they then print on provider B's form – the Request is processed by provider B following presentation of the paper Request form at one of their collection centres, leaving provider A with an electronic Request that will never be processed [NEHT2009].

Other points of concern for pathology providers regarding the Request-Test-Report process include:

- Only limited identity checks are performed at specimen collection centres and there's no way of ensuring that the person from whom a specimen was collected is actually the patient to whom the Request relates;
- Where a specimen was not collected at a collection centre, the time at which the specimen was collected may not be written on the pathology Request, so this information is missed during data entry of the Request to the Laboratory Information System.;
- There is some uncertainty about the acceptance of electronically signed Requests by Medicare in processing of rebates for pathology tests performed by providers;
- The reason for which a particular test is requested may have an impact on billing, however this information is often not included in a Request;
- There is no common set of codes for tests and results and the lack of standardisation causes problems for pathology providers; and

- There is no defined and agreed process for a provider to notify a requester of an urgent/ abnormal Result [NEHT2009].

Points of concern regarding the notification of pathology Results to clinical registries (including notifiable conditions) include:

- Separate code is required for notifications to each registry, as requirements regarding the information to be included with a notification and the format in which it should be sent differ between registries; and
- In some areas of the sector notifications are supplied to state-based registries according to where the test was performed rather than where the patient resides, resulting in fragmented and incomplete registry records. For example, if a patient resides in New South Wales their pap test Result should be sent to the Pap Test Register which is maintained by the Cancer Institute of NSW; however, if the test was performed in Queensland the Result would be sent to the Pap Smear Register which is maintained by Queensland Health [NEHT2009].

Lastly, it is noted that currently tests on foetal specimens are Requested and Reported in the mother's name, raising potential concerns regarding the identification of Requests and Results for foetal tests.

4.1.3.1 Public pathology providers

It is estimated that public pathology laboratories account for approximately 40 per cent of the Australian pathology market, with approximately 16-17 per cent of their revenue coming from federal Medicare pathology funds (however, this share varies greatly by jurisdiction). [NCOP2009]

Public pathology has some different emphases from the private sector. Like other parts of health care, public pathology deals with the management of more complex medical conditions reflecting both the patient casemix and the emergency and intensive care needs of public hospitals.

- **ACT Health** operates a single state-wide pathology service, ACT Pathology, as a business unit of the Canberra Hospital.

- **NSW Health** operates four pathology 'clusters' which cover different areas and regions of the state, as follows:
 - Sydney South West Pathology Service, which is operated by the Sydney South West Area Health Service;
 - South Eastern Area laboratory Services, which is operated by the South Eastern Sydney Illawarra Area Health Service;
 - Western Pathology Cluster, which includes the Institute of Clinical Pathology and Medical Research (ICPMR) at Westmead Hospital, is operated by the Sydney West Area Health Service; and
 - Northern Pathology Cluster, which includes the Pacific Laboratory Medicine Service (PaLMS), provides pathology services from North Sydney to the Qld border.

The Children's Hospital Institute of Pathology at Westmead continues to run a separate specialist pathology service;

- **NT Department of Health and Families** operates the Northern Territory Government Pathology Service as single state-wide service;
- **Qld Health** operates Pathology Queensland as a single state-wide service;
- **SA Health** operates SA Pathology as a single state-wide service;
- **Department of Health and Human Services Tasmania** operates two pathology providers based around two hospitals:
 - Royal Hobart Hospital Service; and
 - Launceston General Hospital Pathology Department
- **Department of Human Services, Victoria** operates pathology providers based around hospitals and health services plus some in regional areas and a couple of specialised services:
 - The Alfred – Bayside Health;
 - Austin Health;
 - Eastern Health Pathology;
 - Melbourne Health;

- Monash Medical Centre – Southern Health;
- Royal Women’s and Children’s – Parkville;
- Peter MacCallum Cancer Centre;
- Victorian Cytology Service (VCS);
- Victorian Infectious Diseases Reference Laboratory (VIDRL);
- Goulburn Valley Health Pathology Service; and
- Swan Hill Hospital – Department of Pathology;
- **WA Health** operates PathWest as a single state-wide service.

4.1.3.2 Private pathology providers

The private pathology industry is well advanced in transition from a large number of “small player”, partnership-based professional practices to a few larger corporate pathology services firms. The industry is expected to become further concentrated, until incumbents are prevented from further acquisitions by the Australian Consumer and Competition Commission [IBIS2009]. IBISWorld estimates that the top four players account for approximately 90 per cent of industry revenue:

- **Sonic Healthcare Limited** – 38.2 per cent market share, operating more than 60 laboratories to service approximately 700 collection centres across 13 separate pathology companies nationally.

Brands include Sullivan Nicholaides Pathology, Douglas Hanley Moir Pathology, Barratt & Smith Pathology, Southern. IML Pathology, Capital Pathology, Melbourne Pathology, Launceston Pathology, Hobart Pathology, North West Pathology, Clinpath Laboratories, Bunbury Pathology and Clinpath Pathology.

For 2007/08 Sonic’s Australian pathology businesses generated a combined revenue of approximately \$800 million (approximately 34 per cent of Sonic’s total \$2.38 billion revenue);

- **Primary Health Care Limited (PHC)** – 36.6 per cent market share. PHC acquired Symbion Health in April 2008; the merged pathology business operates 95 laboratories and 795 collection centres nationally.

Brands include SDS Pathology, Dorevitch Pathology, Gippsland Pathology Service, Symbion Lavery Pathology, QML Pathology and Western Diagnostic Pathology.

For 2007/08 the combined pathology businesses generated revenue of approximately \$310.3 million (approximately 48 per cent of PHC’s total \$649.6 million revenue);

- **Healthscope Limited** – 10.7 per cent market share. During 2007/08 the company’s human pathology business in Australia, which includes brands Gribbles Pathology Group and Davies Campbell de Lambert, generated revenue of \$222.7 million (approximately 15 per cent of Healthscope’s total \$1.49 billion revenue); and
- **St John of God Health Care Inc** – 4.6 per cent market share. The pathology business of this not-for-profit Catholic health care provider operates 24 laboratories and 93 collection centres in regional Victoria and Western Australia, and accounted for \$97 million (approximately 12.7 per cent) of the group’s total \$759.4 million revenue for 2007/08.

4.1.4 Industry and professional bodies

The peak industry and professional bodies of the pathology industry include the Australian Association of Pathology Practices Inc., the National Coalition of Public Pathology, the Royal College of Pathologists of Australasia, the Australian Medical Association and the Royal Australian College of General Practitioners.

4.1.4.1 Australian Association of Pathology Practices (AAPP)

The Australian Association of Pathology Practices is an industry organisation representing most private pathology practices in Australia. The AAPP is an active participant in the setting of standards and guidelines including those from NPAAC, Standards Australia and NEHTA. They also develop their own industry standards such as the AAPP Code of Conduct.

The AAPP worked closely with NEHTA in 2006 to define the business requirements for the electronic transfer of pathology Requests and Result Reports between pathology providers, requesters and copy-to recipients. Those business requirements were used in development of the Pathology Result Reporting Package (v1.0 Draft) [NEHT2008] and will form part of future deliverables of the e-Diagnostics Program.

4.1.4.2 National Coalition of Public Pathology (NCOPP)

The National Coalition of Public Pathology (NCOPP) is an organisation that represents the interests of Public Pathology services. NCOPP members are the major publicly owned and operated pathology services (i.e. not individual pathologists) in each State and Territory.

They provide the majority of pathology services in Australia's public hospitals, in a number of private hospitals and operate community collection services for community based doctors and their patients. Members provide routine and complex testing, health protection services, teaching at both under graduate and post graduate levels, research and leading roles in many aspects of the governance of pathology practice and public health services.

NCOPP has been actively engaged in NEHTA activities. It does not issue codes of conduct etc. as its members are governed by those of public health organisations at state or territory and national levels, as well as those that apply to all providers regardless of ownership.

4.1.4.3 Royal College of Pathologists of Australasia (RCPA)

The RCPA is the professional College that provides training and qualifications for specialist pathologists and in so doing establishes professional standards. RCPA policies and guidelines relevant to the Request-Test-Report cycle include:

- Chain of Information Custody for the Pathology Request-Test-Report Cycle in Australia (Guidelines for Pathology Requesters and Pathology Providers) [RCPA2007];
- Test results from referral laboratories [RCPA2006]; and

- Nurse Practitioners and other Non-Medically Registered Practitioners and Pathology Patient Referral and Pathology Test Requesting in Australia [RCPA2005].

4.1.4.4 Australian Medical Association (AMA)

The AMA is an independent organisation which represents more than 27,000 doctors, whether salaried or in private practice and whether general practitioners, specialists, teachers and researchers, or doctors in training.

The AMA plays an active role in providing guidance to its members through its policies and position statements. Of particular relevance to the pathology Request-Test-Report cycle are those in regards to unique healthcare identifiers [AMA2008], privacy and patient follow-up and tracking [AMA2002].

4.1.4.5 Royal Australian College of General Practitioners (RACGP)

The RACGP is the peak body for general practitioners in Australia. It is also the largest clinical college. It plays an important role as the national leader in setting and maintaining the standards for quality, education, training and research for GPs in Australia.

The College is recognised as the arbiter of standards for General Practice by other clinical colleges, the AMA and Australian government. RACGP publishes the "RACGP Standards for General Practices (3rd Edition)" [RACG2007] as a guideline for General Practices to implement services that promote quality and safety in health care.

In relation to the pathology Request-Test-Report cycle, the RACGP has called on software vendors to focus on the development of reliable systems for the follow up of Requests and Results as a high priority [RACG2007].

4.1.5 Accreditation, standards setting and assessing bodies

Accreditation processes are strong in the field of pathology. The National Pathology Accreditation Advisory Committee (NPAAC) is responsible for the development and maintenance of standards and guidelines for pathology laboratories and these form the basis for audits by the National Association of Testing Authorities (NATA), which assess the conformity of laboratories with those standards and guidelines, and the Royal College of Pathologists of Australasia (RCPA), which undertakes professional certification. NATA audit assessment reports are considered by Medicare Australia in determining access to the Medicare Benefits Scheme.

4.1.5.1 Accreditation bodies

National Pathology Accreditation Advisory Council (NPAAC) – NPAAC advises the Commonwealth, State and Territory Health Ministers on matters relating to the accreditation of pathology laboratories. NPAAC plays a key role in ensuring the quality of Australian pathology services and is responsible for developing policy for accreditation, introducing and maintaining uniform standards of practice, adopting coordinated legislation and administrative action in pathology services and initiating, promoting and coordinating educational programs about pathology laboratory practice.

NPAAC has issued a number of guidelines in relation to laboratories, covering staff; consultation; facilities; health and safety; specimens; equipment and instrumentation; methods; quality management; reporting; records; and data communications.

NPAAC has published “Requirements for Information Communication – 2007 Edition” [NPAA2008] which defines good laboratory practice in relation to the transfer of pathology data, including electronic transfer.

Royal Australian College of General Practitioners (RACGP) – The RACGP is the arbiter of standards for General Practice, publishing the “RACGP Standards for General Practices (3rd Edition)” [RACG2007] as a guideline for General Practices to implement services that promote quality and safety in health care. Refer to Industry and Professional Bodies (section 4.1.4) for further details of the RACGP.

4.1.5.2 Standards setting bodies

Standards Australia is Australia’s peak non-government Standards organisation. It is charged by the Commonwealth Government to meet Australia’s need for contemporary, internationally aligned Standards and related services. Publications relevant to the pathology industry include:

- HB 262-2008 – Guidelines for Pathology messaging between Pathology providers and Health service providers;
- AS 4700.2-2007 – Implementation of HL7 Version 2.4, Part 2: Pathology and medical imaging (Diagnostics);
- AS 4700.2-1998 – Implementation of HL7 Version 2.3, Part 2: Pathology orders and results;
- AS 4700.2-2004 – Implementation of HL7 Version 2.3.1, Part 2: Pathology orders and results;
- AS 4700.2-2004/Amdt 1-2006 – Amendment 1 to AS 4700.2-2004 Implementation of HL7 Version 2.3.1, Part 2: Pathology orders and results; and
- HB 262-2002 – Pathology electronic messaging – Guidelines for pathology messaging between pathology providers and health service providers – Implementation guide.

4.1.5.3 Assessing bodies

National Association of Testing Authorities (NATA) – Whilst NPAAC is responsible for the identification, development and maintenance of standards and guidelines for pathology laboratories, audits against these standards and guidelines are conducted by NATA and the RCPA.

Note that these accreditation arrangements rely on the use of volunteer professional peers conducting assessments of laboratories, led by NATA staff officers who coordinate the activities of the assessment team, assist with interpretation of Standards and encourage consistency and objectivity of approach.

RCPA Quality Assurance Programs Pty Ltd (RCPA QAP) – Established by the RCPA in 1989 to provide external quality assurance systems across all disciplines of pathology to support the scientific and medical communities in Australia initially, and now in many other countries.

4.1.6 Governance bodies

There are a variety of governance bodies relevant to the pathology industry, comprising government bodies, such as the Department of Health and Ageing, Medicare and state and territory health departments, and industry consultative bodies, such as the Pathology Services Table Committee and the Quality Use of Pathology Committee.

Key federal legislation relevant to the pathology Request-Test-Report cycle includes, but is not limited to:

- The Commonwealth Privacy Act 1988 [PRIV2001]; and
- The Health Insurance Act (1973), and subsequent amendments, specifies Health Insurance Regulations and Health Insurance Pathology Service Regulations in relation to the Request for and Confirmation of Requests for Pathology Services [ATTO1973].

4.1.6.1 Department of Health and Ageing (DOHA)

The Australian Government (via DOHA) funds pathology services through two processes:

- A fee for service arrangement established via the Medicare Benefits Scheme (MBS) for pathology services provided to “private” patients either in a public or private hospital or in the community; and
- Joint funding with State Governments of the State public hospital system under the Australian Health Care Agreements. Diagnostic tests for public patients receiving care in a public hospital are provided free of charge to the patient.

4.1.6.2 Medicare Australia

Medicare Australia is the Australian Government statutory authority that delivers Medicare, the Pharmaceutical Benefits Scheme, the Australian Childhood Immunisation Register and the Australian Organ Donor Register.

Pathology tests are paid for through Medicare. In 2006/07, a total of \$1,742 million was paid in Medicare benefits for 88 million pathology items [AIHW2008b.]

Medicare Australia applies rules and standards in relation to electronic communications for referrals/ requests and claims. Medicare Australia follows the guidelines of the Electronic Transactions Act [ATTO1999] and subsequent amendments.

4.1.6.3 State and territory health departments

Most of the state and territory governments have their own policies regarding the capture and retention of data, notifications to clinical registries, transport mechanisms, privacy etc, some of which modify the associated commonwealth policy. NEHTA has planned a detailed analysis of the policies and legislation applicable to the pathology Request-Test-Report cycle which is in place at commonwealth and/ or state/territory levels as part of the e Diagnostics program of work for July - Dec 2009.

The purpose of this analysis is to identify gaps and inconsistencies associated with the various policies and legislation in order to fully understand the impacts to the pathology Request-Test-Report cycle, with particular regard to testing which is performed for patients who are located in a different state or jurisdiction to that in which the pathology test is performed. As a result, this analysis did not form part of this environment scan.

4.1.6.4 Pathology Services Table Committee (PSTC)

The Pathology Services Table (PST) of the Medicare Benefits Schedule lists the pathology tests for which Medicare benefits are available, their Schedule fees and conditions for use. The Government is advised on the composition of the PST by the PSTC which includes experts in pathology from private industry and public hospital practices. The Committee keeps the Table under review to ensure that the services, fees and conditions of use are appropriate, and consults with professional and other expert groups on these issues.

4.1.6.5 Quality Use of Pathology Committee (QUPC)

Improving the quality use of pathology in patient care is an important element of the second Pathology Quality and Outlay Agreement between the Australian Government and the pathology profession.

The Quality Use of Pathology Program (QUPP) aims to maximise the health and economic outcomes of pathology use, particularly through the pursuit of best practice by requestors and providers of pathology services.

The specific objectives of the program are:

- To consolidate and enhance QUPP outputs to date through strategies to:
 - implement and promote implementation of what has been learnt to providers, referrers and consumers; and
 - involve other stakeholders through ongoing dialogue or through the program structure, including referrers such as general practitioners, specialists and medical students.
- To promote, facilitate and support education of referrers, providers and consumers through information and education strategies including:
 - appropriate education and training in pathology at undergraduate level;
 - ongoing education of referrers and providers commencing at entry to workforce and continuing;

- development of case-based learning modules to support evidence-based, best practice requesting and in particular to inform the request-test-report-prescribing sequences for complex, low volume and/or specific disease states and conditions; and
- provision of online consumer and referrer information.
- To progress the development and full operation of a desktop-based electronic decision support system that has high useability and provides online consumer and referrer information; and
- To develop and sustain a comprehensive national communication strategy, in conjunction with consumer health information and advocacy organisations, to promote high awareness of the Program throughout the pathology industry and profession, throughout all referrer professional organisations and media and in health and public policy environments.

4.1.7 Informatics community

4.1.7.1 Pathology standards developers and profilers

There are a range of standards developers relevant to the communication of pathology Requests and Result Reports, including:

- Standards Australia, which develops and maintains the implementation guides for HL7 V2 based messaging formats and also maintains the AustPath pathology test codeset;
- HL7 (Health Level Seven), which develops and maintains standards for interoperability in healthcare; and
- International Health Terminology Standards Development Organisation (IHTSDO), which develops, maintains and promotes SNOMED CT, a comprehensive healthcare terminology.

Additionally, and apart from NEHTA, there are a number of bodies, which whilst not standards developers, are responsible for developing and maintaining artefacts relevant to the communication of pathology Requests and Result Reports, including:

- The U.S. based Regenstrief Institute, Inc maintains the LOINC database of identifiers for laboratory and other clinical observations; and
- IHE (Integrating the Healthcare Enterprise), which develops and maintains “profiles” of healthcare interoperability standards. Profiles are precise definitions of how standards can be implemented to meet specific clinical needs (such as electronic pathology Requests). One of the strengths of IHE’s approach is that it brings vendors together to prove that their systems can indeed communicate using the prescribed protocols. This tends to build a common understanding and interpretation of the use of standards.

4.1.7.2 Software vendors

The software vendors relevant to the pathology Request-Test-Report cycle are those that supply laboratory/pathology information management systems and those that supply medical and other health practice management systems. Some software development and support is also undertaken in-house. Health IT vendor associations are also relevant stakeholders.

Clinical information systems – there are many different practice management systems available in Australia, although HCN’s Medical Director (MD) is the market leader. Other substantial systems include BestPractice, Genie, Locum, MedTech, PractiX, Profile, TotalCare and ZedMed.

Laboratory information systems – vendors active in Australia currently include Cerner, GE Healthcare, IBA/iSoft, Intersystems (supporting pathology vendors), Kestral, MacCauley Software, Medical Objects (histology) and PJACC. Note that this is not a comprehensive list.

International vendors and “in-house” systems service most of the large private and public laboratories and these tend to deploy international standards rather than local standards. Local developers tend to service the small to medium sized laboratories.

4.1.7.3 Secure messaging providers

The bulk of electronic pathology messages are sent by pathology providers using their own proprietary systems. Secure messaging providers such as Argus, HealthLink, Medical Objects and others shield pathology providers from the variability in messages to and from the various practice management systems by undertaking message transformations. The secure messaging provider uses hardware and software which they own and/or control to link networks of health service providers by installing their proprietary software on requester desktops (typically free-of-charge) and then channel pathology and other messages to the GPs and others who form their network. The message senders (primarily pathology providers but also some specialists) pay.

4.1.7.4 Vendor Associations

The Medical Software Industry Association (MSIA) represents the interests of the Australian commercial software industry that develops, supplies and services information management products and services for health care practitioners, health care service providers and health care organisations.

The Australian Information Industry Association (AIIA) is the national organisation representing the broader information technology and telecommunications industry in Australia. AIIA sets the strategic direction of the ICT industry, negotiates public policy, engages industry stakeholders and provides member companies with business productivity tools, advisory services and market intelligence designed to accelerate their business growth. However, AIIA appears to have little operational relationship with pathology laboratory information system or practice management system providers.

4.2 Existing prevailing specifications

There are a range of Australian and international guidelines, specifications and standards applicable to the Request-Test-Report cycle of the Australian pathology industry, covering areas including, but not limited to, secure messaging and message formats, terminology codesets and interoperability. A detailed review of these guidelines, specifications and standards has been planned as part of the e Diagnostics program of work for July - Dec 2009 in order to identify any areas which need to be addressed via the development of new, or modification of existing, guidelines, specifications and standards. As a result, this analysis did not form part of this environment scan.

4.3 Regulation and policy

Medicare benefits are payable for pathology services if the specimens are collected through an Approved Collection Centre, the tests are undertaken by an Approved Pathology Practitioner in an Accredited Pathology Laboratory and the laboratory is operated by an Approved Pathology Authority.

Approval usually involves, among other things, the pathology authority holding accreditation through the joint scheme conducted by NATA and the RCPA for the category of services.

Medicare outlays (and hence a major part of industry revenues) are capped via 'episode coning' for out-of-hospital patients, via which only the three most expensive tests for any single testing episode are eligible for a Medicare rebate (i.e. for Requests which are bulk billed, the provider does not receive payment for any tests which have been 'coned out'). Industry sources suggest that approximately ten per cent of private testing performed by public pathology providers are 'coned out' for Medicare rebates.

Changes to the scheduled fees for patient episode initiation and the introduction of bulk billing incentives from 1 Nov 2009 as part of the budget for 2009/10 are expected to realise a net saving of \$415.8 million in Medicare benefits over four years. Pathology providers will be paid on the basis of how many specimens they collect rather than the number of tests which are performed.

The Australian Government collects comprehensive data about pathology services that are funded by Medicare, however data collection is impacted by policies associated with the Medicare item for patient episode initiation and 'coning' rules, resulting in some data not being captured. There is no comprehensive data collection for services which are not funded by Medicare, making it difficult to accurately estimate the size of the non-Medicare pathology market.

Note that a detailed analysis of the policies and legislation applicable to the pathology Request-Test-Report cycle which is in place at commonwealth and/or state/territory levels has been planned as part of the e Diagnostics program of work for July - Dec 2009. Refer to section 4.1.6.3 of this document for further details of this piece of work.

5 Summary and Recommendations

5.1 Key business drivers and issues

Pathology provider organisations, both public and private, have well established business and system processes for the electronic storage and communication of pathology information. However there is considerable variability in file structures and terminology code sets – not just between providers, but between the various laboratories operated by a single provider. While there is considerable advantage to be gained by the entire health care system in standardising code sets and messaging structures and protocols, the associated costs are considerable. Pathology providers have demonstrated a keen interest in furthering the secure exchange of reliable and meaningful pathology information between health care providers, however there is little incentive for them to progress their e-Pathology journeys unless requesters get on board, too.

“There is emerging evidence that, as the quality of the laboratory testing continues to improve, the relative risk of patient harm or adverse outcome is now far greater in the processes leading to delivery of the pathology specimen to the laboratory, or in the process by which the pathology result is communicated to the treating clinician.” [NPAA2007]

With Australian pathology laboratories already amongst the most efficient in the world, it's not the pathology providers who have sole responsibility for enabling some of the key opportunities for better patient outcomes as a result of e-Pathology. For example, the automated reconciliation of Requests with Result Reports would enable timely and efficient follow-up and closure of the pathology Request-Test-Report cycle. However, this will be impossible to achieve unless electronic Requesting is embraced as standard business practice by General Practitioners, Physicians and other requesters – in both public and private facilities – across Australia.

During execution of this environment scan a number of standards and legislative policies were identified which require further examination leading up to the adoption of e-Pathology at a national level. A detailed examination of the standards and legislation which are applicable to the pathology industry will form part of NEHTA's program of work for the period July - December 2009. This will be undertaken in order to identify any ambiguities, gaps or inconsistencies which may need to be addressed.

A key step to obtaining stakeholder buy-in for e-Pathology is to obtain broad agreement about the e-Pathology vision – i.e. what will e-Pathology look like over the next two-to-five years and five-to-ten years? Clear articulation of the e Pathology vision will allow NEHTA and pathology stakeholders to agree the extent of what needs to be done, who is responsible, what are the dependencies, the appropriate timeframes and key success factors and criteria. Only then will stakeholders be able to develop roadmaps for their own national e Pathology journeys.

5.2 Opportunities

The following opportunities to address key clinical business problems were identified during the execution of this environment scan.

Opportunity	Benefits	Recommended Action(s)
Development of a process and mechanism by which a requester is alerted that an abnormal/clinically significant Result has been reported which requires their action. This would include escalation of the alert to the requester's nominated delegate(s) until such time as the alert has been acknowledged by the requester or their nominated delegate(s).	<ul style="list-style-type: none"> Facilitates better patient outcomes due to increased likelihood that clinically significant Results will be actioned promptly by the patient's clinician. 	NEHTA to conduct an opportunity assessment.
Development of specifications for electronic pathology Requests.	<ul style="list-style-type: none"> Lays foundation for the automated reconciliation of Requests with Result Reports; and Improved information flow through the Request-Test-Report cycle. 	NEHTA to conduct an opportunity assessment.
Development of a model for the automated reconciliation of Result Reports with Requests within clinical systems. This should include proactive and on-demand reporting of Requests for which one or more Results are outstanding.	<ul style="list-style-type: none"> Improved quality, safety and efficiency through automation of a cumbersome and error-prone task. 	NEHTA to conduct an opportunity assessment.
Delivery of incentives for the adoption of NEHTA's specifications for pathology messaging within clinical systems.		NEHTA to investigate in conjunction with DOHA.

5.2 Opportunities (continued)

Opportunity	Benefits	Recommended Action(s)
Development of guidelines for detailed (patient centric) information regarding a Request provided to a Patient at time of Request.	<ul style="list-style-type: none"> Improved patient experiences through: <ul style="list-style-type: none"> Decrease in the number of instances patients need to re-present for specimen collection due to not meeting pre-testing requirements; Information provided regarding possible out-of-pocket expenses known before tests are requested improving likelihood of patients presenting for specimen collection. 	NEHTA to investigate in conjunction with DOHA.
Development of specifications for the electronic notification of pathology Results to clinical registries	<ul style="list-style-type: none"> Improved reporting efficiencies through a reduction in effort required to code each registry separately; Improved registry information. 	NEHTA to conduct an environment scan of notifications of pathology (and diagnostic imaging) Results to clinical registries.
Development of specifications for tracking the status of individual tests within a Request as they move through the Request-Test-Report cycle.	<ul style="list-style-type: none"> Improved visibility of the Request-Test-Report cycle. 	NEHTA to conduct an opportunity assessment.
Delivery of unique identifiers for patients and healthcare providers (individuals and organisations).		None - this work is in progress.
Development of specifications for Decision Support tools for requesters of pathology testing.	<ul style="list-style-type: none"> Better patient outcomes through more appropriate requesting / testing. 	NEHTA to conduct an opportunity assessment.
Development of terminology sets for specimen collection and transport protocols.		NEHTA to conduct an opportunity assessment.

5.3 Next steps

This environment scan document will be presented to the Diagnostic Services Reference Group for endorsement of the recommended actions.

Subsequently, the high level business requirements for, and the dependencies between, the opportunities described in this document will be balanced with the priorities which have been articulated by stakeholders [NEHT2009] in order to develop the e-Diagnostics program of work for the period to June 2012.

It is expected that the e-Diagnostics program of work for the period July-December 2009 will be published in early July 2009, with a detailed roadmap (as described in section 3.2.2 of this document) covering the period to June 2012 to be published by December 2009.

Definitions

This section explains the specialised terminology used in this document.

Shortened terms

This table lists abbreviations and acronyms in alphabetical order.

Term	Description
LOINC	Logical Observation Identifiers Names and Codes
SNOMED CT	Systematized Nomenclature of Medicine - Clinical Terms

Glossary

This table lists specialised terminology in alphabetical order.

Term	Description
Communicable Disease	Diseases which can be 'caught', for example diseases which are transmitted from human to human (e.g. measles), via insects (e.g. malaria and dengue fever), via animals (e.g. bat lyssavirus and toxoplasmosis), or via the environment (e.g. water borne disease such as legionella; food borne disease such as salmonellosis; etc).
e-Diagnostics Program	The purpose of NEHTA's e-Diagnostics Program is to utilise a national e health approach to deliver solutions to specific clinical business problems of the pathology and diagnostic imaging industries.
Episode cone	The episode cone is an arrangement, described in Rule 18 of the Pathology Services Table, which effectively places an upper limit on the amount of Medicare benefits payable in a patient episode. The episode cone only applies to services requested by general practitioners for their non-hospitalised patients.
LOINC	A database and universal standard for identifying medical laboratory observations which was developed and is maintained by the Regenstrief Institute, Inc in 1994. LOINC applied universal code names and identifiers to medical terminology in order to assist in the electronic exchange and gathering of clinical information (including laboratory tests, clinical observations, outcomes management and research).
PEST	A framework for the analysis of a macro environment by considering the P olitical, E conomic, S ociological and T echnological factors which define the environment.

References

This section lists documents and other artefacts that have been referenced within this document. Some of these artefacts may not be freely available in the public domain.

At the time of publication, the document versions indicated are valid. However, as all documents listed below are subject to revision, readers are encouraged to use the most recent versions of these documents.

[REF]	Document Name	Publisher	Link
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Appendix A: Collaborators

A.1 Clinical leaders

Clinical Leaders are a select group of practicing clinicians with diverse clinical backgrounds led by Melbourne GP and former Australian Medical Association President, Mukesh Haikerwal. The Clinical Leaders team has been assigned to various areas of the NEHTA work program to provide an important sounding board for the development of our work in real world contexts and to advise on likely issues and appropriate mechanisms for engaging with clinical stakeholders.

The Clinical Leaders assigned to the e-Diagnostics Program are as follows:

- Dr Ben Connell;
- Dr Peter Del Fante;
- Dr Rob Hosking;
- Dr Henry Konopnicki;
- Dr Trevor Lord; and
- Dr Chris Wagner.

A.2 Diagnostic Services Reference Group

The Diagnostic Services Reference Group (DSRG) has been established to provide advice to the Stakeholder Reference Forum (SRF), NEHTA Board and CEO. Membership of the DSRG consists of those who are responsible for both implementing and using the deliverables of the e-Diagnostics Program and includes representation from jurisdictions, clinicians, consumers, industry, private health and NEHTA.

Current Members of the DSRG are as follows:

Member	Representing
Alan Lloyd	Sonic Healthcare; Australian Association of Pathology Practices
Dean Meston	NEHTA (e-Diagnostics Program Lead)
Dougall McBurnie	Healthscope Limited
Geraldine Robertson	Consumers Health Forum (Diagnostic Imaging rep.)
Hugh Greville	NEHTA Clinical Leaders Network
Janine Bevan	Department of Health and Aging / eHealth Branch
Janney Wale	Consumers Health Forum (Pathology representative)
Julia Potter	ACT Pathology; National Pathology Accreditation Advisory Council
Lawrie Bott	The Royal College of Pathologists of Australasia
Neville Board	Australian Commission on Safety and Quality in Health Care
Nick Ferris	The Royal Australian and New Zealand College of Radiologists
Owen Smalley(Co-Chair)	ACT Health; National Health Chief Information Officers Forum
Paul Carroll	Queensland Health
Paul Williams	NEHTA (Head of Solution Development)
Peter Garcia-Webb(Co-Chair)	The Australian Medical Association; NEHTA Stakeholders Reference Forum
Philip Dubois	Australian Diagnostic Imaging Association
Roger Wilson	NSW Health; The National Coalition of Public Pathology