NGS testing for blood cancers in Australia

- MBS subsidy and beyond

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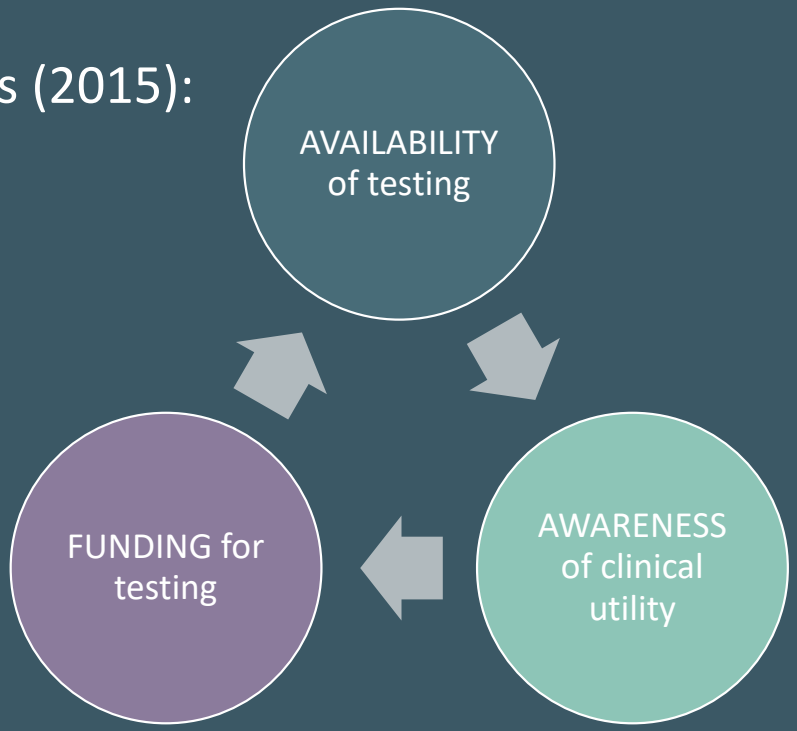
PPA National Forum, Innovations Plenary
South Australia 2024

THE PROBLEM

Lack of access to genomic testing for patients with blood cancer in Australia

Barriers (2015):



THE SOLUTION

- **AVAILABILITY** | Develop and offer accredited genomic testing
- **AWARENESS** | Provide testing, education, clinician support
- **FUNDING** | Advocate for sustainable funding (i.e. MBS)

MBS funding – laying the groundwork

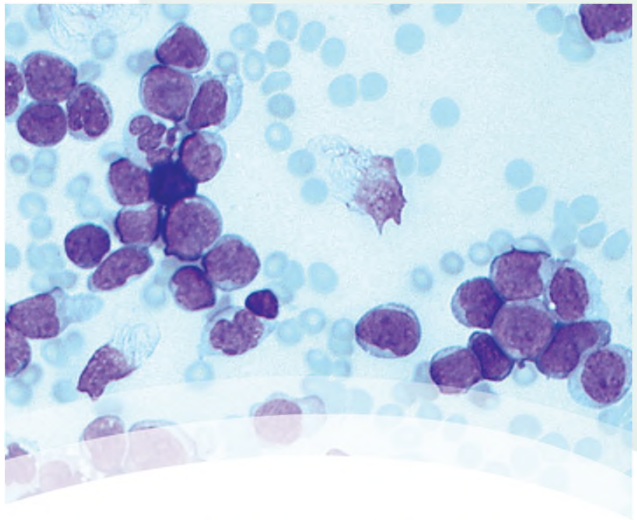
2015

- Accredited NGS test offered by Peter Mac

  Note: Critical importance of hospital and departmental support, philanthropic funding
  - Patient care
  - Education re clinical utility (passive and active)
  - Creating awareness/demand
  - Building workforce

2020

- National Strategic Action Plan for Blood Cancer
  - Blood Cancer Taskforce / Leukaemia Foundation, commissioned by Federal Government



National Strategic Action Plan for Blood Cancer

JUNE 2020

Action 2.3

Make precision medicine the standard of care

Linked actions for implementation

2.2

3.1

4.3

Rationale

Blood cancer has been at the forefront of precision medicine, and as research has advanced, the understanding of the genomic complexity of blood cancers has increased markedly.

Genomic profiling is required for accurate subtype diagnosis and the subsequent treatment of blood cancer patients. Through genomic profiling clinicians can more precisely match patients to targeted therapies. These efforts are critical to the expansion of precision medicine and the realisation of curative therapies.

In Australia today, however, access to genomic diagnostics is limited and privately funded, creating barriers to equitable access and slowing the development of data to inform research efforts.

To support improvements in clinical practice and blood cancer research efforts, precision medicine (with genomic testing as required) should be made the standard of care.

Implementation

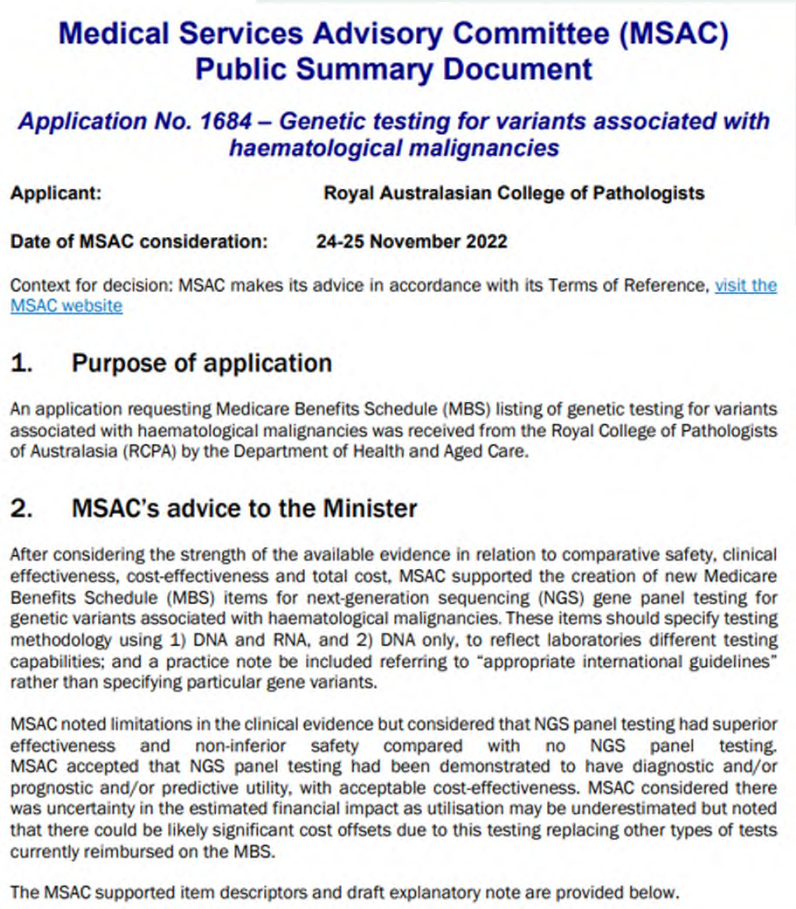
2.3.1 The implementation of precision medicine as a standard of care could be developed and funded as part of the Blood Cancer Research Program and supported by a working party focussed on the harmonisation of research efforts and evidence development for regulatory approval across Australia.

Benefits

- Reduced mortality.
- Improved quality of life.
- Sustainability in health services.

MBS funding – the application process

- Request to RCPA steering committee to consider MSAC application for NGS testing in blood cancer Jun2021
- Working group formed (RNSH, RPA, Pathology Queensland, PathWest, PMCC)
- MSAC application (standard pathway) 14Sep2021
  - Health Technology Assessment (HSA)
  - Public Consultation
  - PICO* Advisory Sub-committee (PASC) 1-10Dec2021
  - Evaluation Subcommittee (ESC) 6-7Oct2022
  - Medical Services Advisory Committee (MSAC) 24-25Nov2022
  - Approval Informal 30Jan2023
- Implementation 1Nov2023



Medical Services Advisory Committee (MSAC)
Public Summary Document

Application No. 1684 – Genetic testing for variants associated with haematological malignancies

Applicant: **Royal Australasian College of Pathologists**

Date of MSAC consideration: **24-25 November 2022**

Context for decision: MSAC makes its advice in accordance with its Terms of Reference, visit the MSAC website

1. Purpose of application

An application requesting Medicare Benefits Schedule (MBS) listing of genetic testing for variants associated with haematological malignancies was received from the Royal College of Pathologists of Australasia (RCPA) by the Department of Health and Aged Care.

2. MSAC's advice to the Minister

After considering the strength of the available evidence in relation to comparative safety, clinical effectiveness, cost-effectiveness and total cost, MSAC supported the creation of new Medicare Benefits Schedule (MBS) items for next-generation sequencing (NGS) gene panel testing for genetic variants associated with haematological malignancies. These items should specify testing methodology using 1) DNA and RNA, and 2) DNA only, to reflect laboratories different testing capabilities; and a practice note be included referring to "appropriate international guidelines" rather than specifying particular gene variants.

MSAC noted limitations in the clinical evidence but considered that NGS panel testing had superior effectiveness and non-inferior safety compared with no NGS panel testing. MSAC accepted that NGS panel testing had been demonstrated to have diagnostic and/or prognostic and/or predictive utility, with acceptable cost-effectiveness. MSAC considered there was uncertainty in the estimated financial impact as utilisation may be underestimated but noted that there could be likely significant cost offsets due to this testing replacing other types of tests currently reimbursed on the MBS.

The MSAC supported item descriptors and draft explanatory note are provided below.

* population, intervention, comparator, and outcomes

New MBS item numbers – 1st November 2023

Gene panels	Any suspected blood cancer (myeloid or lymphoid origin)	DNA and RNA	**Item 73445:** Characterisation of a variant or variants in a panel of at least 25 genes using DNA and RNA, requested by a specialist or consultant physician, to determine the diagnosis, prognosis and/or management of a patient presenting with a clinically suspected haematological malignancy of myeloid origin. Applicable once per diagnostic episode, at diagnosis, disease progression or relapse. Full fee $1,100
			Item 73446: Characterisation of a variant or variants in a panel of at least 25 genes using DNA and RNA, requested by a specialist or consultant physician, to determine the diagnosis, prognosis and/or management of a patient presenting with a clinically suspected haematological malignancy of lymphoid origin. Applicable once per diagnostic episode, at diagnosis, disease progression or relapse. Full fee $1,100
		DNA only	**Item 73447:** Characterisation of a variant or variants in a panel of at least 25 genes using DNA, requested by a specialist or consultant physician, to determine the diagnosis, prognosis and/or management of a patient presenting with a clinically suspected haematological malignancy of myeloid origin. Applicable once per diagnostic episode, at diagnosis, disease progression or relapse. Full fee $927.90
			Item 73448: Characterisation of a variant or variants in a panel of at least 25 genes using DNA, requested by a specialist or consultant physician, to determine the diagnosis, prognosis and/or management of a patient presenting with a clinically suspected haematological malignancy of lymphoid origin. Applicable once per diagnostic episode, at diagnosis, disease progression or relapse. Full fee $927.90
NGS-based MRD	Acute lymph. leuk.	Not specified	**Item 73310:** Measurable residual disease (MRD) testing by next-generation sequencing, performed on bone marrow (or a peripheral blood sample if bone marrow cannot be collected) from a patient diagnosed with acute lymphoblastic leukaemia, for the purpose of determining baseline MRD, or facilitating the determination of MRD following combination chemotherapy or after salvage therapy, requested by a specialist or consultant physician practising as a haematologist or oncologist. Full fee $1,550.00

MBS funding – service preparedness

- 8-month preparation window 30-Jan-2023 to 1-Nov-2023
- Goals (for our service):
  - Prepare for 2x to 3x increase in clinical requests
    - Business case supported by hospital
    - Change of technology for increased throughput
      - Incidental: update of gene content from 57 to 80 genes
    - Improved analysis and reporting workflows
    - Additional staff (senior genomic data scientist, genetic counsellor, medical scientist, laboratory technician, consultant haematologist)
  - Develop and validate RNA fusion panel

MBS funding – short term impact

- Our service
  - Near immediate doubling of NGS test requests (~200/week)
    - 16% internal (84% external)
    - 47% from Victoria (53% interstate)
    - 84% medicare
  - Improved TATs
  - Implementation of RNA fusion panel
    - Cold case diagnoses
- More widely
  - Incentive for more labs to offering testing
    - Service continuity
    - Service variability

MBS funding – long term opportunities

1. Improve standard of blood cancer genomic testing offered diagnostically in Australia
2. Improve access/reach

Development of a comprehensive blood cancer panel and pipeline

- Maximise value of MBS funding
- Opportunities to improve and potentially harmonise testing
- Upgrade current 80 gene panel to a more comprehensive offering
  - WGS not yet feasible for detection of low-level variants without matched normal
  - Variants, CNV, targeted SVs, IGH rearrangements, mutation signatures, MRD reporter variant identification
- Develop processes that can be accessed/utilised by other Australian laboratories
  - Library preparation – product number for ordering
  - Pipeline – collaboration with Hartwig Medical Foundation Australia to provide a cloud-based companion pipeline
  - Database – common platform provides powerful opportunity for collating data for assist with analysis

Technology Standardisation

Develop a comprehensive panel for blood cancer, available for shared use

Analysis Pipeline

Develop a cloud-based companion pipeline, accessible for shared use

Clinical Reporting

With colleagues work toward a standardised approach to clinical reporting.
Develop a cloud-based companion tertiary analysis platform for shared use

Blood Cancer Database

Develop a publicly available data repository storing demographic, clinical and genomic data from consenting patients who have accessed the genomic testing available through this framework

Improve reach

Education and Outreach

- Monthly national forums for case discussion of blood cancer and bone marrow failure
- National symposia on blood cancer genomics
- Molecular haematology fellows (RCPA accredited), PhD students, master students, visiting haematologists

Clinical Service

- Genetic Haematology Service (sub stream of MDS/AML in Clinical Haematology)
- Incidental findings from genomic reports, follow up of germline findings from diagnostic reports, diagnostic uncertainty, inherited bone marrow failure syndromes.

Genomic Advocacy

- Contribute to guidelines/position statements on use of genomics in blood cancer
- Recent establishment of RCPA Molecular Haematology User Group (Clare Gould, Piers Blombery)

NGS testing for blood cancers in Australia – MBS subsidy and beyond

Public Pathology AUSTRALIA

Problem: Lack of access to genomic testing for patients with blood cancer in Australia, with barriers including availability of testing, awareness of clinical utility, sustainable funding for testing

Solution:

AVAILABILITY > develop and offer accredited genomic testing

AWARENESS > provide testing, education, clinician support

FUNDING > advocate for sustainable funding (i.e. MBS)

Results:

~2x increase in test requests

Improved in service provision (complexity, delivery) locally and nationally

Opportunities to continue to improve standard of genomics testing, inter-laboratory harmonisation, research applications