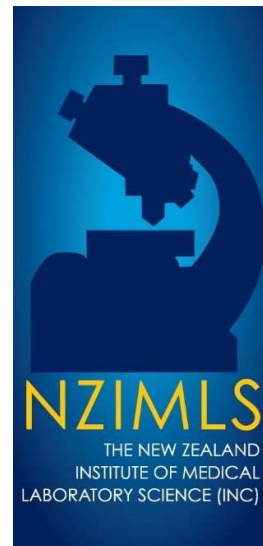


QUALIFIED MEDICAL  
LABORATORY TECHNICIAN

## **TRANSFUSION SCIENCE**

2022 CURRICULUM



### **Part One: Common Curriculum**

### **Part Two: Discipline Specific Curriculum in Transfusion Science**

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## Introduction

### Definition of a Medical Laboratory Technician

A Medical Laboratory Technician (MLT) is a person employed to perform routine tasks by following established protocols under the supervision or direction and control of a Registered Medical Laboratory Scientist. A MLT may only practise within their area of competence, in a health service that forms part of the medical laboratory science profession. During training, supervision would be direct. However, after suitable assessment of competency, it may be replaced with direction\* by a Registered Medical Laboratory Scientist or another registered health practitioner with an appropriate scope of practice, other than a Medical Laboratory Technician.

The QMLT candidate has two Curricula to study:

- **The Common Curriculum** which is common to all NZIMLS technician qualifications.
- **The Discipline Specific Curriculum** which is common only to the discipline in which the candidate is sitting the QMLT exam.
- This document combines both the **Common Curriculum (Part One)** and the **Discipline Specific Curriculum (Part Two)**.

## Objectives

1. **Education of Medical Laboratory Technicians and Medical Laboratory Pre-Analytical Technicians**
  - a. To provide an employer recognisable qualification in a New Zealand Medical Laboratory/Blood Service.
  - b. To provide a qualification that is recognised by the Medical Sciences Council of New Zealand for the Registration of Qualified Medical Laboratory Technicians (QMLT) and Qualified Medical Laboratory Pre-Analytical Technicians (QMLPAT).
  - c. To provide sufficient theoretical training to enable a medical laboratory technician or medical laboratory pre-analytical technician to perform their practical work with accuracy, reliability and efficiency.
  - d. To enable them to appreciate the reasons for, and the importance of the procedures and the tests that they perform.
  - e. To enhance interest in their work and increase job satisfaction and self-esteem.
2. **QMLT and Common Curricula**
  - a. To prescribe the course of study for the QMLT examination.
  - b. To define the composition of the examination.

The Transfusion Science Special Interest Group (TSSIG) has prepared both a curriculum and practical assessment for use by Trainee Medical Laboratory Technicians preparing for the NZIMLS QMLT examinations.

The practical assessment found in Part 2 section **is compulsory** and has been included to aid candidates preparing for the QMLT examinations and to be a record of training or practical competency, accomplished by mastery assessment.

**NOTE - The practical assessment is a requirement and must be presented as part of the examination and qualifying process.**

The Transfusion Science SIG has taken significant steps to limit the theoretical knowledge required, to be sufficient to perform bench procedures and understand the importance of recognising abnormal or anomalous results for referral to a supervisor.

The request for specific numbers of points and the reduction in the number of tests to be performed in the practical assessment, is an endeavour to limit the quantity of information to learn and examine.

***This does not preclude employers training their laboratory assistants for their own needs.***

### **Competence Standards**

*(Reproduced with permission from the Medical Sciences Council of New Zealand)*

Competence standards are a description of the ability of a medical laboratory science practitioner to practise safely and effectively in a variety of contexts and environments. Competence is influenced by many factors including, but not limited to, the practitioner's qualifications, clinical experience, professional development and his/her ability to integrate knowledge, skills, attitudes, values and judgements within a practice setting. A critical value of competence standards is the capacity to support and facilitate professional practice and growth.

The standards set out in this document are expressed as entry-level competencies and behaviours. However, it is expected that all practitioners will successively build on these competence standards to levels expected of experienced practitioners.

The competence standards identify the minimum knowledge, skills and professional attributes necessary for practice. During any one procedure it is expected practitioners will demonstrate elements of practice across a number of broadly defined domains of competence. This recognises that competent professional practice is more than a sum of each discrete part. It requires an ability to draw on and integrate the breadth of competencies to support overall performance.

## Context of the Competence Standards

*(Reproduced with permission from the Medical Sciences Council of New Zealand)*

The competence standards are directly linked to the three medical laboratory science scopes of practice defined by the Council under the Act.

Medical laboratory science practitioners in Aotearoa New Zealand practise within a legislated regulatory framework under the Health Practitioners Competence Assurance Act 2003. Defining scopes of practice serves to protect the health and safety of the public through the use of protected professional titles. Only individuals who hold current registration with the Medical Sciences Council are permitted to use the professional titles of:

- Medical Laboratory Scientist
- Medical Laboratory Technician
- Medical Laboratory Pre-Analytical Technician

## Competence Standards for Medical Laboratory Science Practitioners in Aotearoa New Zealand

### An Overview of the Competencies Domains

*(Reproduced with permission from the Medical Sciences Council of New Zealand)*

Key competencies are arranged within a number of integrated themes called *Domains*. There are five domains of competence that apply to each of the scopes of practice for medical laboratory science practitioners. In addition, competencies specific to each scope of practice are articulated in a number of subsets (5A to 5C) of the fifth domain.

#### Domain 1: Professional and Ethical Conduct

This domain covers practitioners' responsibility to be professional and ethical and to practise within the current medico-legal framework. Includes their responsibility for ensuring patient confidentiality/privacy is maintained at all times while recognising the potential role as a patient advocate.

#### Domain 2: Communication and Collaboration

This domain covers practitioners' responsibility in utilising appropriate, clear and effective communication and their responsibility for ensuring they function effectively as a member of a health team at all times.

#### Domain 3: Evidence-Based Practice and Professional Learning

This domain covers practitioners' responsibility to engage in evidence-based practice and to critically monitor their actions through a range of reflective processes. It includes their responsibility for identifying, planning and implementing their ongoing professional learning needs.

**Domain 4: Safety of Practice and Risk Management**

This domain covers practitioners' responsibility to protect patients, others and the environment from harm by managing and responding to the risks inherent in both healthcare and medical laboratory science practice. It includes their responsibility for ensuring high quality professional services are provided for the benefit of patients and other service users.

**Domain 5: Medical Laboratory Science Practice**

This domain covers the knowledge, skills and capabilities practitioners need to practise the profession of medical laboratory science. Elements in this domain are common to all medical laboratory science practitioners, taking into account the different requirements of each scope of practice.

**Domain 5A: Medical Laboratory Scientist**

This domain covers the additional knowledge, skills and capabilities specific to the Medical Laboratory Scientist scope of practice.

**Domain 5B: Medical Laboratory Technician**

This domain covers the additional knowledge, skills and capabilities specific to the Medical Laboratory Technician scope of practice.

**Domain 5C: Medical Laboratory Pre-Analytical Technician**

This domain covers the additional knowledge, skills and capabilities specific to the Medical Laboratory Pre- Analytical Technician scope of practice.

More detailed information on these Standards can be found on the Medical Sciences Council website under "Competence Standards for Medical Laboratory Science Practitioners in Aotearoa New Zealand (revised February 2018).

## Part One

### Common Curriculum

#### Definitions

1. **Quality assurance**  
All those planned and systematic actions necessary to provide adequate confidence that a product or service will satisfy a given requirement for quality.
2. **Quality Control**  
The monitoring and control of the process producing the product and service.
3. **Total Quality Management (TQM)**  
Management philosophy of continual incremental improvement through total involvement. Seeks, through the utilisation of fully trained, informed and involved employees, participating and working with management to satisfy customer requirements, to improve overall quality, productivity, efficiency and company viability.  
  
Reference ISO 15189
4. **Ethics**  
The rules or principles that govern right conduct.
5. **Confidential information**  
Information (written or spoken) given on the understanding that it will not be passed on to others.
6. **Patient/Donor confidentiality**  
Non-disclosure of patient's/donor's personal information, other than to his or her clinician, unless authorised by that patient/donor.
7. **Informed consent**  
Agreeing to something once provided with all the facts, understanding them fully and knowing one's rights as an individual.
8. **Cultural Competence**  
A set of congruent behaviours, attitudes and policies that enables effect interaction in cross-cultural situations. 'Culture' refers to integrated patterns of human behaviour that include language, thoughts, communications, actions, customs, beliefs, values and institutions of racial, ethnic, religious or social groups. 'Competence' implies having the capacity to function effectively as an individual and an organisation within the context of the cultural beliefs, behaviours and needs presented by patients and their communities.  
(Adapted from Cross 1989).

## Word Definition

The following word definitions will be used to describe the level of knowledge a QMLT shall be required to achieve. Examination questions will also use these words.

WORD DEFINITIONS	
LIST	Headings only
DEFINE	State meaning clearly and concisely
OUTLINE	Write brief notes incorporating the essential facts
IDENTIFY	Recognise according to established criteria
DESCRIBE	Give a complete account demonstrating a thorough practical knowledge in a logical sequence
INDICATE	Briefly point out
CLASSIFY	Be able to designate to a group
DISTINGUISH	To briefly point out the main differences
DISCUSS	Give details, explaining both the positives and negatives
CALCULATE	Perform a mathematical process to get the answer
MATCH	Find one that closely resembles another
EXPAND	To express at length or in greater details
COMPLETE	Finish, have all the necessary parts
NAME	A word or group of words used to describe or evaluate
LABEL	Give a name to
CONVERT	Express in alternative units
INTERPRET	Express the results of a test or series of tests in a meaningful format
STATE	Give the relevant points briefly
COMPARE	Detail both the differences and the similarities

## Dilution Factor Definitions (where applicable)

Due to inconsistencies in nomenclature associated with dilution expression the following will be used for calculations in the examination:

**½ and 1 in 2:** implies 1 part added to 1 part making a total of 2 parts,  
i.e. A dilution factor of x2.

**1 to 2:** implies 1 part added to 2 parts making a total of 3 parts,  
i.e. A dilution factor of x3.

Because of the dual meaning of the expression 1:2, it will not be used in the examinations.

## **1.0 What is Medical Laboratory Science?**

- 1.1 Describe the role and understand the definition of medical laboratory science within the context of sample collection and analysis to aid the diagnosis and monitoring of disease, medical conditions and treatments thereof and in the testing and accreditation of donated blood and blood products to ensure the health of the donor and the safety of the blood supply.
- 1.2 Describe the concept of cultural competence, professional behaviour and attitude within a Medical Laboratory or Blood Service pertaining to:
- Patients, clinicians and colleagues.
  - Patient fluid, tissue and body parts.
  - Blood donors.
  - Donated blood, blood components, or tissue.
  - Be familiar with the MSCNZ statement of Cultural Competence, December 2007, and the attitudes, knowledge and skills expected of a QMLT or QMLPAT in their dealings with patients and colleagues.
- 1.3 Outline the role of the professional/legislative bodies representing, training and governing Medical Laboratory Science in New Zealand.
- NZIMLS (New Zealand Institute of Medical Laboratory Science).
  - MSCNZ (Medical Sciences Council New Zealand).
  - Universities that train Medical Laboratory Scientists.
  - Understand the five codes of competencies (practise as a professional, practise as a technician, safe practice, communication and culturally competent practice) and associated standards as outlined in the Medical Sciences Council New Zealand's Code of Competencies and Standards for the Practice of Medical Laboratory Science.
- 1.4 Outline the major functions of the following departments / sections and their interrelationships within a laboratory.
- Haematology
  - Biochemistry
  - Microbiology
  - Immunology
  - Virology
  - Histology
  - Cytology
  - Cytogenetics
  - Forensic Science / Mortuary Practice
  - Molecular Diagnostics / Genetics
  - New Zealand Blood Service
  - Collection services (Phlebotomy)
  - Call Centre for helpline, results & enquiries
  - Specimen Services



- 1.5 Outline the major functions / roles of the following laboratory staff:
- Laboratory Clinical Director.
  - Pathologist, general and specialist.
  - Laboratory Manager.
  - Technical Head / Head of Department.
  - Section Leader / Technical specialist / Supervisor.
  - Scientific Officer.
  - Registered Medical Laboratory Scientist.
  - Registered Medical Laboratory Technician (QMLT).
  - Registered Medical Laboratory Pre-Analytical Technician (QMLPAT).
  - Registered Nurse within the New Zealand Blood Service.
  - Clerical / Administration staff.
- 1.6 Outline the role of the Laboratory with referring health professionals such as General Practitioners, specialists/ consultants, nurses and patients.
- 1.7 Identify and expand basic medical terminology and general abbreviations that relate to the laboratory. To include common prefixes and suffixes (e.g. hyper, hypo, -itis, neuro, -philia).

## **2.0 Ethics and Legislation**

- 2.1 Outline:
- Patient/Donor confidentiality.
  - Informed consent.
  - Duty of care (do no harm).
  - Statutory requirements for release of body parts to patients / families.
  - Statutory obligations for the release of samples (to referral laboratories, chain of evidence parties, patients).
  - Laboratory policies for the release of information / results to patients/donors.
  - A Medical Laboratory's organisation's obligations to the Treaty of Waitangi.
  - The Code of Health & Disability Services and Consumer Rights.
  - The NZIMLS code of ethics.
  - Knowledge of Health Practitioners Competence Assurance Act (2003).
- 2.2 Outline how the Health Practitioners Competence Assurance (HCPA) Act 2003 and following amendments relates to Medical Laboratory Science and the Health sector.
- 2.3 Describe the legal obligation for technicians to be registered and to hold an annual practicing certificate.
- 2.4 Define scope of practice.
- 2.5 Describe the scope definitions for a medical laboratory technician and medical laboratory pre-analytical technician, including the difference between provisional and full registration.

### **3.0 Human Anatomy and Physiology**

- 3.1 Identify the position of the major organs of the human body.
- 3.2 Outline their basic function.
- 3.3 Identify the specimen types (and their origin) encountered in Medical Laboratories.

### **4.0 Specimens**

- 4.1 Outline procedures for the packaging and transport of specimens for delivery to a laboratory (from the patient to a laboratory, and between laboratories).
- 4.2 Outline the procedures for the selection, preparation and storage of specimens within the laboratory.
- 4.3 Describe appropriate specimen labelling requirements including those for New Zealand Blood Service.

### **5.0 Safety**

List your personal duties as a worker under the Health and Safety at Work Act 2015.

- 5.1 Define, with examples, a notifiable injury or illness, notifiable incident, and notifiable event, according to the Health and Safety at Work Act 2015.
- 5.2 Describe safety precautions and emergency procedures for incidents involving the following:
  - Fire
  - Electrical apparatus
  - Chemical (poisons, carcinogens, corrosive and volatile substances, gases, radioactive substances, liquid nitrogen)
  - Spillages of blood and other biological fluids
  - Earthquakes
- 5.3 Outline an accident reporting procedure for the workplace.
- 5.4 Outline the role of a health and safety representative.
- 5.5 Describe the safe handling of biological material under the following headings:
  - Identification of routes of infection
  - Types of infectious material
  - Safety equipment
  - Handling
  - Disposal
  - Decontamination
  - Transportation
- 5.6 Identify international safety symbols that are used in the workplace.
- 5.7 Describe the concept of safe practice within the workplace.

- 5.8 Describe the prevention and emergency treatment of the following:
- Eye splashes
  - Cuts and bleeding
  - Needle or sharps injury
  - Blood and Body Fluid exposure
  - Burns
  - Poisoning
  - Electric shock
  - Loss of consciousness
- 5.9 Outline Hazard Identification and Management including the use of Material Safety Data Sheets.
- 5.10 Outline the concept of occupational health and the role of self-protection through staff vaccination programmes, e.g., Hepatitis B vaccination.
- 5.11 Outline the principle of Occupational Overuse Syndrome/Gradual Process Injuries and its relevance in the laboratory, including some prevention strategies.

## 6.0 Equipment

- 6.1 Describe the use and routine maintenance (where applicable) of the following equipment:
- Thermo-regulated apparatus (Incubators, water baths, heating blocks, refrigerators, freezers)
  - Balances
  - Distilled/deionised water apparatus
  - Glassware
  - Pipetting devices - manual and automated/mechanical liquid handling devices
  - Biohazard cabinets
  - Fume hoods/fume cupboards
  - Transport systems (including pneumatic tubes, couriers)

(NOTE: "**Maintenance**" in the context of this curriculum refers to daily good house-keeping practices required to keep equipment clean and functioning at peak efficiency. Laboratory technicians are encouraged to recognise faults in equipment but must refer them to their supervisor for corrective action.)

- 6.2 Centrifuges:
- Outline the principle of centrifugation.
  - Describe the use and maintenance required.
  - Describe the safety precautions necessary including specimen breakage.
- 6.3 Computers:
- Outline basic computer components including hardware and software.
  - Describe the role of computers in the laboratory / workplace.
- 6.4 Barcodes and Scanners:
- Describe the use of barcodes and barcode scanners

## **7.0 Quality Assurance**

- 7.1 Define quality assurance and total quality management.
- 7.2 Describe quality control.
- 7.3 Define and distinguish accuracy and precision.
- 7.4 Define a Biological Reference Interval.
- 7.5 Describe the role of ISO 15189 within the Medical Laboratory.
- 7.6 Outline Harmonisation as it relates to Laboratory Medicine.
- 7.7 Outline internal and external audit processes including the assessment bodies (e.g. International Accreditation New Zealand (IANZ), Ministry of Primary Industries (MPI)).
- 7.8 Outline the concept of Documentation Control within the Medical Laboratory.
- 7.9 Outline quality feedback by customers (patients, donors and health professionals).

## **8.0 Calculations**

The student shall be able to perform basic laboratory calculations including:

- Converting units – for example:  $\mu\text{mol}$  to  $\text{mmol}$ ,  $\text{ml}$  to  $\text{L}$ ,  $\text{g}$  to  $\text{kg}$ , fractions to percentage.
  - Define SI units – pico, nano, mili, micro, kilo as they relate to the power of 10.
  - Common laboratory calculations for dose time and urine volume.
  - Define pH and use this understanding to differentiate between acidic and basic solutions.
- 8.1 Dilutions:
- Calculate volumes required to make a working solution from a stock solution.
  - Calculation of patient results post dilution.
- 8.2 Statistics:
- Calculation of average, mean, standard deviation and coefficient of variation using a calculator.
  - Creation of and plotting results onto a Levy Jennings graph.
  - Basic interpretation of Levy Jennings graphs.
- 8.3 Calculation of Molarity from molecular weight (note molecular weight to be supplied in examination).

Other calculations specific to your discipline.

See Guide to Calculations on the NZIMLS website under Education.

## 9.0 Reference Texts

Below are listed suggested reference texts. The latest versions are recommended. This is not an exhaustive list.

### 9.1 Specimens

Diagnostic Samples: From the Patient to the Laboratory: The Impact of Preanalytical Variables on the Quality of Laboratory Results  
Guder W.G, Narayansan S, Wisser H, Zawta B  
Wiley-Blackwell

Clinical Diagnostic Technology – The total Testing Process, Volume 1: The Preanalytical Phase  
Ward-Cook K.M, Lehmann C.A, Schoeff L.E, Williams R.H  
AACC Press, Washington DC

IATA Infectious Substances Guidelines Manual 2015 edition  
IATA Dangerous Goods Regulations Manual 2016 edition

Land Transport Rule Dangerous Goods 2005  
<https://www.nzta.govt.nz/resources/rules/dangerous-goods-2005/>

### 9.2 Human Anatomy and Physiology

Phlebotomy Handbook  
Garza d, Becan-McBride K  
Pearson Educational, New Jersey USA

Phlebotomy Essentials  
McCall R.E, Tankersley C.M  
Lippencott, Williams & Wilkins, Philadelphia, USA

### 9.3 Equipment

Clinical Chemistry: Theory Analysis and Correlation  
Kaplan L.A., Pesce A.J.  
Mosby; Missouri, USA

TIETZ: Textbook of Clinical Chemistry and Molecular Diagnostics  
Carl A Burtis, Edward R Ashwood and David E Bruns Saunders; Philadelphia, USA  
TIETZ: Fundamentals of Clinical Chemistry and Molecular Diagnostics  
Carl A Burtis and David E Bruns Saunders; Philadelphia, USA

### 9.4 Safety

Clinical Microbiology Procedures Handbook  
Isenberg H.D. Chief Editor  
American Society Microbiology Washington DC

Laboratory Safety Principles and Practices  
Fleming D.O., Richardson I.H., Tulis I.1, Vesley D.  
American Society Microbiology Washington DC.

## 9.5 Legislation and Standards

Health Practitioners Competence Assurance Act (2003)

*ISO 15189:2012 Medical laboratories – Requirements for quality and competence*

*AS/NZS 2243 Safety in laboratories*

*Clinical and Laboratory Standards Institute (CLSI) guidelines*

[www.legislation.govt.nz](http://www.legislation.govt.nz)

Code of Ethics of the New Zealand Institute of Medical Laboratory Science

[www.nzimls.org.nz](http://www.nzimls.org.nz)

Competence Standards for Medical Laboratory Science Practitioners in Aotearoa New Zealand (revised 2018). [www.msccouncil.org.nz](http://www.msccouncil.org.nz)

Statement of Cultural Competence (2007)

[www.msccouncil.org.nz](http://www.msccouncil.org.nz)

## **Part Two**

### **Discipline Curriculum Transfusion Science**

#### **1. Equipment and Consumables – Transfusion Science**

- 1.1 Describe the basic principles and use of automated equipment used with column agglutination technology (CAT) and solid phase testing in Blood Banks.
- 1.2 Outline the principles of the use of a blood management system for blood banking, including the importance of data integrity for the safety and traceability of blood transfusion.
- 1.3 Outline routine quality assurance of blood storage equipment (refrigerators, freezers, platelet incubators).
- 1.4 Describe quality control checks of routine immunohaematology reagents.

#### **2. Sample and Patient Management – Transfusion Science**

- 2.1 Outline methods and documentation used for the collection, transport and storage of specimens for all routine transfusion laboratory procedures, including Tissue Typing procedures.
- 2.2 Identify the need for correct clerical details, positive patient identification and maintenance of accurate records. Describe sample acceptance criteria for pretransfusion testing samples.
- 2.3 Identify reasons for rejecting samples for Transfusion tests.

#### **3. Blood Group Systems**

- 3.1 Classify blood groups using the correct nomenclature.
- 3.2 Describe the blood group systems of ABO, Rh, Kell, Duffy, Kidd, Lewis, MNS, P and I under the following headings:
  - Major antigens and their frequencies
  - Inheritance patterns
  - Serological characteristics of antibodies
  - Clinical significance of antibodies

#### **4. Immunology and techniques**

- 4.1 Describe the nature and types of blood group antibodies, distinguishing between typical and atypical antibodies and clinically significant and non-clinically significant antibodies.
- 4.2 Describe the basic principles of the humoral immune response (antibody production).
- 4.3 Describe principles of antigen-antibody reactions and the in vitro processes of sensitisation and agglutination.
- 4.4 Outline the role of complement in serological reactions, in vivo and in vitro.
- 4.5 Describe the principles of the saline technique as performed in tube, column agglutination and solid phase technology. Outline applications and sources of error together with quality control procedures.
- 4.6 Describe the principles of the antiglobulin technique (direct and indirect), as performed in tube,

column agglutination and solid phase technology. Outline applications and sources of error together with quality control procedures

## **5.0 Collection and Processing of Blood Donations**

- 5.1 List the major criteria for the acceptance of blood donors. (Note that a basic understanding of common exclusion criteria is required, but the candidate is not expected to memorise the entire Donor guidelines).
- 5.2 Outline the preparation, collection and storage of red cell components, platelet components and frozen plasma components.
- 5.3 Outline the storage requirements for fractionated blood products.
- 5.4 Outline packing and transport requirements of red cell components, frozen plasma components, platelet components, and fractionated blood products.

## **6.0 Donation Accreditation**

- 6.1 Outline the testing requirements for accreditation of a blood donation. List the tests and techniques used and outline their broad principles.

## **7.0 Blood Banking**

- 7.1 Identify sample requirements specific to pretransfusion compatibility testing, including labelling, validity and registration.
- 7.2 Describe the principles and procedures of pretransfusion compatibility testing, including:
  - ABO and Rh typing of patients
  - Antibody screening and antibody identification
  - Extended phenotyping of patients and donors
  - Pre-requisites for and process of electronic release of blood
  - Pre-requisites for and process of serological crossmatch
  - Selection of appropriate donor units for safe provision of compatible blood for patients with and without atypical red cell antibodies
  - Blood management system patient protocols in patients with special transfusion requirements
- 7.3 Describe the selection, matching and issue of blood components and products for adult and paediatric patients in non-urgent and urgent situations, including during a massive transfusion protocol (MTP) event. The specified components and products with which the candidate must be familiar are:
  - Red cell components
  - Plasma components, including fresh frozen plasma and cryoprecipitate. Describe thawing protocols and storage of thawed components
  - Platelet components
  - Fractionated products



## 8.0 Clinical applications of Transfusion Science

8.1 Describe adverse effects of transfusions, including:

- Classification and frequency of types of transfusion reactions
- Specimens required for the investigation of a suspected transfusion reaction
- Procedures used to investigate a suspected transfusion reaction, and significance of results.

8.2 Describe haemolytic disease of the fetus and newborn (HDFN) under the headings of:

- Aetiology of HDFN due to different blood group antibodies
- Principles and procedures of antenatal and postnatal testing
- RhD immunoglobulin used for the prevention of RhD HDFN.

### Suggested Reference Texts and Materials

AABB Technical Manual.

Fung M, Eder AF, Spitalnik SL, Westhoff CM. 19th Edition:2020

American Association of Blood Bank

Modern Blood Banking and Transfusion Practices

Harmening, D. 7th Edition: 2019

F.A. Davis

ANZSBT Guidelines for Transfusion and Immunohaematology Laboratory Practice.

Australian and New Zealand Society of Blood Transfusion 1st edition:2020

<https://anzsbt.org.au/guidelines-standards/anzsbt-guidelines/>

NZBS Transfusion Medicine Handbook

New Zealand Blood Service

<https://www.nzblood.co.nz/clinical-information/transfusion-medicine/transfusion-medicine-handbook/>

NZBS Clinical Compendium

<https://www.nzblood.co.nz/clinical-information/transfusion-medicine/clinical-compendium/>

New Zealand Blood Service

NZBS electronic resources

New Zealand Blood Service

[www.nzblood.co.nz](http://www.nzblood.co.nz)