MINISTRY OF HEALTH
SINGAPORE

MH 78:44/1 MOH Circular No. 11/2025

14 March 2025

Outpatient Medical Service Licensees
Acute Hospital Service Licensees
Community Hospital Service Licensees
Nursing Home Service Licensees

UPDATES ON PROPOSED REGULATORY FRAMEWORK FOR CLINICAL GENETIC TESTING SERVICES (CGTS)

This circular updates licensees and on the regulatory framework for Clinical Genetic Testing Services (CGTS).

BACKGROUND

2. The 'Standards for the Provision of Clinical Genetic / Genomic Testing Services (CGTS) and Clinical Laboratory Genetic / Genomic Testing Services (LGTS) were **issued as a Code of Practice (COP)** on 1 July 2018 and subsequently updated on 16 December 2020. The COP sets out minimum standards for the Provision of CGT and LGT[1] services by licensees and personnel providing such services.

3. **Under the Healthcare Services Act (HCSA), the COP will be translated into either regulatory requirements prescribed as Licence Conditions (LCs) or guidelines.** This transition from COP to HCSA regulatory requirements will be done in phases, starting with this circular, which outlines the regulatory framework for CGTS. A separate update will be provided on the regulatory requirements for LGTS.

4. For CGTS, there will be both LCs (setting out requirements to be complied with) and guidelines (setting out best practices).

[1]Clinical Genetic / Genomic Testing Services are provided under Outpatient Medical Service (OMS), Acute Hospital Service (AHS), Community Hospital Service (CHS) or Nursing Home Service (NHS) while Clinical Laboratory Genetic / Genomic Testing Services are provided under Clinical Laboratory Service (CLS).

Ministry of Health, Singapore
College of Medicine Building
16 College Road
Singapore 169854
TEL (65) 6325 9220
FAX (65) 6224 1677
WEB www.moh.gov.sg

DEFINITIONS

5. **CGTS is defined as:**

(a) the **offering or ordering** of genetic or genomic tests that analyse DNA, RNA or chromosomes; or
(b) the **provision of counselling or genetic counselling** for tests that analyse DNA, RNA or chromosomes,

for purposes such as the diagnosis, monitoring, prognosticating, risk assessment, or management of a disease or condition. It **refers only to the clinical and patient-facing aspect of genetic testing** and does not include the laboratory testing of specimens (which falls under LGTS). Preimplantation genetic testing is also not regulated under CGTS as it is separately regulated under the Assisted Reproduction Service.

6. As CGTS is scoped to genetic tests that analyse DNA, RNA or chromosomes, **protein-based tests will fall outside the regulatory scope of CGTS** (e.g., biochemical tests which may reveal a genetic condition but are non-DNA/RNA/chromosomal in nature). The use of such protein-based tests is already regulated under the respective licensable healthcare services under the HCSA, and additional regulatory requirements will not be prescribed under CGTS.

7. The stages for the provision of CGTS for the purpose of outlining the regulatory requirements in this circular is based on the **Diagram** below.

**Mandatory to offer*

where:

"Counselling" means the process of helping a patient to understand and manage the patient's health, which may take place in a medical consultation with a patient before and after the provision of a genetic test.

"Genetic Counselling" is the process of helping a patient to understand and adapt to the medical, psychological and genetic contributions of a disease or condition so as to allow for informed decisions to be made with regard to the disease or medical condition or the risk of having a disease or medical condition.

Ministry of Health, Singapore
College of Medicine Building
16 College Road
Singapore 169854
TEL (65) 6325 9220
FAX (65) 6224 1677
WEB www.moh.gov.sg

TIERING OF CGTS

8. CGTS will have **three levels based on the risk of (i) misinterpreting results and (ii) mismanaging patients** (i.e., inappropriate ordering of genetic tests, inappropriate or harmful intervention following test results). The tiering of CGTS will be based on the genetic tests used in the provision of CGTS. A description of each tier can be found in **Table 1** below:

Table 1: Tiering of CGTS

<table>
<tr><th colspan="2">Tier</th><th>Description</th></tr>
<tr><td colspan="2">Level 1</td><td>DNA, RNA or chromosomal tests with a low risk of misinterpreting results and mismanaging patients. These tests are whitelisted in Annex A and include:
(a) A list of designated pharmacogenetic tests.
(b) Genetic tests of variants / changes important in tissue typing for transplant.
(c) Genetic tests of variants / changes important in blood typing and blood product transfusion.</td></tr>
<tr><td rowspan="2">Level 2</td><td>A (Designated List of Somatic Tests)</td><td>DNA, RNA or chromosomal tests with a moderate risk of misinterpreting results and mismanaging patients. These are a list of designated somatic genetic tests whitelisted in Annex B.</td></tr>
<tr><td>B / C (Designated List of Germline Tests)</td><td>DNA, RNA or chromosomal tests with a moderately high risk of misinterpreting results and mismanaging patients.

These are a list of designated germline genetic tests whitelisted in Annex C and divided into 2 categories as follows:
(a) 2B (Protocolised Germline): List of designated germline genetic tests performed according to a protocol approved by the Director-General of Health (DGH) that takes into consideration downstream funding and care options.
(b) 2C (Germline): List of designated germline genetic tests.</td></tr>
<tr><td colspan="2">Level 3</td><td>DNA, RNA or chromosomal tests with a high risk of misinterpreting results and mismanaging patients. All DNA, RNA or chromosomal tests will fall within this level by default, except for the list of designated tests whitelisted under Levels 1, 2A, 2B or 2C.</td></tr>
</table>

9. **By default, all genetic tests fall into Level 3**, and MOH has and will be continuing to work with our Genetic Testing Advisory Committee (GTAC) and Colleges

Ministry of Health, Singapore
College of Medicine Building
16 College Road
Singapore 169854
TEL (65) 6325 9220
FAX (65) 6224 1677
WEB www.moh.gov.sg

and Chapters from the Academy of Medicine, Singapore (AMS) to **identify genetic tests which could be whitelisted into Levels 1, 2A, 2B or 2C**. The whitelisting of designated genetic tests under Levels 1, 2A, 2B or 2C is based on the following **considerations**:

(a) The **nature of the test** and the **medical practitioners who will use the test**;
(b) Whether there is **training available** for medical practitioners to learn to use and interpret the test safely; and
(c) Whether there are **local or international guidelines available** to guide the use and interpretation of the test.

10. MOH will conduct **yearly reviews of the whitelisted tests** in Levels 1, 2A, 2B and 2C CGTS to assess whether certain Level 3 genetic tests could be whitelisted into these tiers. During the review period, MOH will invite licensees and AMS to provide feedback on potential genetic tests they may wish to include in the whitelist, the necessary justifications for the inclusion and acceptable training and qualifications for ordering and conducting counselling or genetic counselling of these tests.

11. MOH has developed a **decision matrix** (see **Annex D**) to assist licensees in determining the appropriate tier of CGTS that the genetic test they provide fall into. **Regulatory requirements vary based on the tier assigned to each test**.

PERSONNEL REQUIREMENTS FOR CGTS

12. **The training and qualifications required for personnel ordering and providing counselling or genetic counselling for Level 1 to Level 3 CGTS** are in **Table 2.**

Table 2: Training and Qualifications Required for Personnel Providing CGTS

CGTS Tier	Action	Requirements
Level 1	Counselling	(a) Medical practitioner (b) Any personnel that the licensee has assessed to be competent in counselling and performs counselling under the oversight of a medical practitioner providing care to the patient.
	Ordering[2]	(a) Medical practitioner
Level 2A	Counselling	(a) Medical practitioner with qualifications in clinical genetics; or (b) Medical practitioner with specialised training in the use of the specific genetic test; or

[2] Ordering of the test may be carried out by a personnel that the licensee has assessed to be competent (e.g., genetic counsellor), **under the supervision** of a medical practitioner with the specified training and qualifications (e.g., co-signed by the medical practitioner). **This medical practitioner maintains overall responsibility** for ordering the correct test, interpretating the test result and managing the patient, regardless of who puts in the order. This process should be carried out based on a written standing protocol approved by a medical practitioner with the specified training and qualifications.

Ministry of Health, Singapore
College of Medicine Building
16 College Road
Singapore 169854
TEL (65) 6325 9220
FAX (65) 6224 1677
WEB www.moh.gov.sg

		(c) Any personnel that the licensee has assessed to be competent in counselling and performs counselling under the oversight of a medical practitioner providing care to the patient.
	Ordering[2]	(a) Medical practitioner with qualifications in clinical genetics; or (b) Medical practitioner with specialised training in the use of the specific genetic test.
Level 2B/2C	Genetic Counselling[3]	(a) Medical practitioner with qualifications in clinical genetics; or (b) Medical practitioner with specialised training in the use of the specific genetic test; or (c) Qualified genetic counsellor; or (d) Any other personnel approved by the DGH.
	Ordering[2]	(a) Medical practitioner with qualifications in clinical genetics; or (b) Medical practitioner with specialised training in the use of the specific genetic test.
Level 3	Genetic Counselling[3]	(a) Medical practitioner with qualifications in clinical genetics; or (b) Medical practitioner with specialised training in the genetics of a specific disease or condition; or (c) Qualified genetic counsellor; or (d) Any other personnel approved by the DGH.
	Ordering[2]	(a) Medical practitioner with qualifications in clinical genetics; or (b) Medical practitioner with specialised training in the genetics of a specific disease or condition.

13. **MOH will provide more information** on the training and qualifications required for personnel ordering and providing genetic counselling for Levels 2B, 2C and 3 CGTS in **2H 2025.** These qualifications will be reviewed annually, alongside the whitelists of genetic tests.

[3]Please refer to **Annex E and F** for the recommended components of pre- and post-test genetic counselling respectively. The manner in which pre- and post-test genetic counselling was provided and conducted shall be properly documented.

Ministry of Health, Singapore
College of Medicine Building
16 College Road
Singapore 169854
TEL (65) 6325 9220
FAX (65) 6224 1677
WEB www.moh.gov.sg

REGULATORY APPROACH UNDER THE HCSA

14. MOH will prescribe the requirements for (i) the need to conduct counselling and genetic counselling and (ii) the training and qualifications of personnel ordering and providing counselling or genetic counselling for Levels 1 to 3 CGTS in LCs under the HCSA. All licensees providing Levels 1 to 3 CGTS will be required to comply with the requirements applicable to the CGTS tier that their genetic test falls into. In addition, **Level 3 CGTS provided under the Outpatient Medical Service (OMS) would be regulated as a Specified Service under OMS**. Hence, OMS licensees intending to provide Level 3 CGTS would need to apply for the CGTS SS and can only provide these services following approval from MOH. **Table 3** shows the approach to regulating CGTS under various licensable healthcare services under the HCSA.

Table 3: Regulation of CGTS under HCSA licensable healthcare services

CGTS Tier	Inpatient Services (a) Acute Hospital Service (b) Community Hospital Service (c) Nursing Home Service	Outpatient Services (a) Outpatient Medical Service (OMS)[4]
Level 1	• Not listed as a Specified Service (SS) but regulated with requirements prescribed in LCs. • Notification to MOH will be required.	• Not listed as a Specified Service (SS) but regulated with requirements prescribed in LCs. • Notification to MOH will be required.
Level 2A		
Level 2B/2C		
Level 3		• **Regulated as a SS** with requirements prescribed in LCs. • **Approval from MOH will be required before the start of the service**.

15. **MOH will provide an update on the detailed regulatory requirements for CGTS in 2H 2025**, including more information on the training and qualifications required for personnel ordering and providing genetic counselling for Level 2B, 2C and Level 3 CGTS, **but licensees will be given a sunrise period to work towards meeting these regulatory requirements.** This means that enforcement of the requirements, including the need for OMS licensees to hold an SS approval for Level 3 CGTS, will only start after the sunrise period. We will be communicating the details of this sunrise period in 2H 2025, along with the other updates.

[4] For OMS, CGTS should only be provided remotely alongside other modes of service delivery (MOSDs) (i.e., permanent premises, temporary premises or conveyance) and should not be offered as a standalone remote MOSD. Licensees will only be approved to provide CGTS remotely as part of the approval for other MOSDs.

Ministry of Health, Singapore
College of Medicine Building
16 College Road
Singapore 169854
TEL (65) 6325 9220
FAX (65) 6224 1677
WEB www.moh.gov.sg

16. In the meantime, for HCSA licensees who are currently providing or intending to provide Levels 1 to 3 CGTS, please **notify MOH by filling up this form** by **30 Apr 2025** so that MOH can engage you further on the upcoming regulatory requirements.

17. You may contact MOH at HCSA_Enquiries@moh.gov.sg for any further enquiries.

Thank you.

PROF KENNETH MAK
DIRECTOR-GENERAL OF HEALTH
MINISTRY OF HEALTH

Ministry of Health, Singapore
College of Medicine Building
16 College Road
Singapore 169854
TEL (65) 6325 9220
FAX (65) 6224 1677
WEB www.moh.gov.sg

Annex A: List of Tests Under Level 1 CGTS

I. Pharmacogenomic Tests

Gene(s)/variant(s) being tested for	Drugs affected by gene(s)/variant(s) being tested for
VKORC1, CYP4F2 and CYP2C9	Warfarin
TPMT, NUDT15	Thiopurines (azathioprine, mercaptopurine and thioguanine)
UGT1A1	Irinotecan
*HLA-B*5701*	Abacavir
*HLA-B*5801*	Allopurinol
*HLA-B*1502*	Carbamazepine, phenytoin
HLA-B27	Sulphasalazine
CYP3A5	Tacrolimus
CYP2C19	Citalopram, Escitalopram
	Clopidogrel
	Voriconazole
CYP2C19 and CYP2D6	Amitriptyline
CYP2D6	Fluvoxamine, Paroxetine, Nortriptyline
	Codeine, Tramadol, Oxycodone
	Ondansetron, Tropisetron
	Tamoxifen
*CYP2C9, HLA-B*1502*	Phenytoin
ABCG2	Rosuvastatin
SLCO1B1	Simvastatin, Rosuvastatin
*Actionable PGx Genotyping Panel (CYP3A5, CYP2C9, CYP2C19, CYP2D6, CYP4F2, NUDT15, TPMT, VKORC1, SLCO1B1, HLA-B*1502, HLA-B*5701, HLA-B*5801)*	Multiple
DPYD	5-fluorouracil chemotherapy

II. Non-pharmacogenomic Tests

Gene(s)/variant(s) being tested for	Indications which gene(s)/variant(s) are tested for
*HLA-DQ2**	Risk of celiac disease
*HLA-DQ8**	Risk of celiac disease
All relevant	Tissue typing for transplant
All relevant	Blood typing for blood product transfusion

**Mainly predicts autoimmune disorder due to ingestion of gluten*

Ministry of Health, Singapore
College of Medicine Building
16 College Road
Singapore 169854
TEL (65) 6325 9220
FAX (65) 6224 1677
WEB www.moh.gov.sg

Annex B: List of Tests Under Level 2A CGTS

1. Oncology-related somatic next generation sequencing (NGS) tests.

Annex C: List of Tests Under Level 2B/2C CGTS

Level 2B

1. Genetic test for Familial Hypercholesterolemia (FH) under the nation-wide FH screening programme[5].

Level 2C

1. Germline oncology tests.

2. Chromosome karyotyping.

3. Basic non-invasive prenatal test (NIPT) which tests for Trisomies 21/18/13, sex chromosome aneuploidy, 22q11.2 deletion +/- triploidy.

4. Quantitative Fluorescence- Polymerase Chain Reaction (QF-PCR) for rapid testing for Trisomies 21/18/13 and sex chromosomal aneuploidies.

5. Fluorescence in-situ hybridisation (FISH) for rapid testing for Trisomies 21/18/13 and sex chromosomal aneuploidies.

6. Chromosomal microarray or its equivalent (e.g., low pass whole genome sequencing) for miscarriages or stillbirth.

7. Advanced NIPT which tests for other microdeletions or rare autosomal trisomies for pregnancies which meet certain clinical criteria.

8. Carrier screening.

9. Tests for Y chromosome microdeletions in the azoospermia factor (AZF) region for men with severe oligospermia and azoospermia.

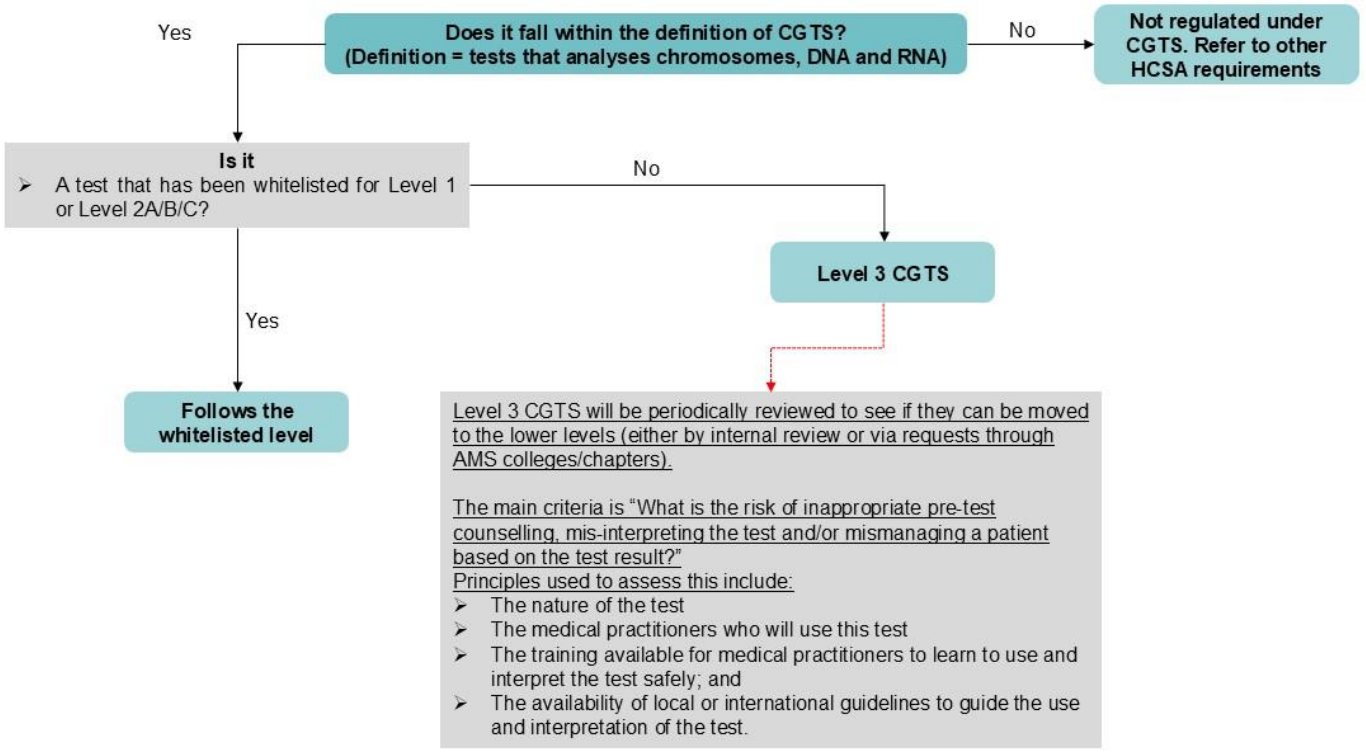
10. Thalassemia genotyping.

[5] Genetic tests for FH that is not conducted under the nation-wide FH screening programme will fall under Level 3 CGTS.

Ministry of Health, Singapore
College of Medicine Building
16 College Road
Singapore 169854
TEL (65) 6325 9220
FAX (65) 6224 1677
WEB www.moh.gov.sg

MINISTRY OF HEALTH
SINGAPORE

Annex D: Decision Matrix for Tiering of CGTS



Ministry of Health, Singapore
College of Medicine Building
16 College Road
Singapore 169854
TEL (65) 6325 9220
FAX (65) 6224 1677
WEB www.moh.gov.sg

MINISTRY OF HEALTH
SINGAPORE

<u>Annex E:</u> Recommended Components of Pre-Test Genetic Counselling

(a) the nature of the condition or genetic variant/change abnormality to be tested, including its symptoms, natural history and inheritance pattern;
(b) the condition or genetic variant/change's effect on the patient; and the risk of the patient transmitting this condition or genetic variant/change to the next generation;
(c) a general description of the genetic test and the purpose of the test;
(d) the genetic testing procedure, including the type of sample required, its cost, and other reasonably foreseeable risks, discomforts or inconveniences to the patient arising out of the genetic test;
(e) the effectiveness and limitations of the genetic test (e.g. analytical sensitivity and specificity);
(f) the foreseeable outcomes of the genetic test and their interpretations, including the discussion on the institutional and laboratory policies on the return of incidental and/or secondary findings;
(g) any foreseeable consequences to the patient arising out of the genetic test, such as psychological stress, impact on insurability and employment, and implications on family members;
(h) the turn-around time of the genetic test and how the results will be disclosed to the patient and/or person giving consent;
(i) the option to withdraw from genetic testing before the completion of the test, or to postpone the receipt of test results;
(j) where the patient is found to have a condition or genetic variant/change, the treatment and management options of the condition or genetic variant/change, and their potential outcomes. Where there are no treatment options for the patient's condition or genetic variant/change, there should be a discussion on whether there are any alternative procedures or treatments available, and the potential benefits, risks and limitations of such alternatives;
(k) the option of not being tested and its potential benefits and limitations;
(l) the alternatives to genetic testing and the benefits and limitations of these alternatives;
(m) the person or categories of persons or organisations to whom the test results may be disclosed (e.g. those involved in the care of the patient);
(n) the extent to which information and records identifying the patient will be kept confidential;
(o) any further use and management of the patient's genetic information (including the use and management of the genetic information after death, where possible); and
(p) any further use, management and disposal of the patient's samples (including the use, management and disposal of the samples after death, where possible).

Ministry of Health, Singapore
College of Medicine Building
16 College Road
Singapore 169854
TEL (65) 6325 9220
FAX (65) 6224 1677
WEB www.moh.gov.sg

Where appropriate, the following information shall also be included:

(q) any foreseeable third parties' interests in the patient's genetic information, and the likely consequences of disclosure of the patient's genetic information to those third parties; and

(r) the possibility of incidental findings (such as the discovery of parentage discrepancy even though the test is not a parentage test), the likely implications of these findings and how such findings are to be managed (including whether the patient will want to know such findings).

Ministry of Health, Singapore
College of Medicine Building
16 College Road
Singapore 169854
TEL (65) 6325 9220
FAX (65) 6224 1677
WEB www.moh.gov.sg

Annex F: Recommended Components of Post-Test Genetic Counselling

(a) the results of the genetic test and the interpretation of these results;
(b) the implications of the test results to the patient and his/her family members;
(c) where the patient is found to have a condition or genetic variant/change, the treatment and management options of the condition or genetic variant/change, and their potential outcomes. Where there are no treatment options for the patient's condition or genetic variant/change, there should be a discussion on whether there are any alternative procedures or treatments available, and the potential benefits, risks and limitations of such alternatives;
(d) any psychological, social and ethical issues or concerns;
(e) requirement or obligation to disclose the test results to a third party (if any);
(f) the protection of the patient's privacy and confidentiality in relation to his/her genetic test results; and
(g) where relevant, the consideration for testing of family members' carrier status and/or variant status for confirmation of the patient's condition:
  (i) For autosomal dominant (AD) conditions, testing for parental variant status should be offered to determine the origin of the variant (i.e. de novo, inherited, germline mosaicism);
  (ii) For autosomal recessive (AR) conditions, testing for parental carrier status should be offered to determine the phase of the variants;
  (iii) For X-linked conditions, testing for parental variant status should be offered (i.e. for X-linked recessive conditions, maternal testing should be considered; for X-linked dominant conditions, testing of both parents should be considered) to determine the origin of the variant (de novo, inherited from mother, germline mosaicism); and
  (iv) For variant of uncertain significance (VUS), testing of family members may be considered if the results will help to interpret the variant or reclassify the variant.

Ministry of Health, Singapore
College of Medicine Building
16 College Road
Singapore 169854
TEL (65) 6325 9220
FAX (65) 6224 1677
WEB www.moh.gov.sg