CTASC Examination

Certificate of Cytotechnology of the Australian Society of Cytology

2019 Guidelines

Australian Society of Cytology

CONTENTS

INTRODUCTION

The **Certificate of Cytotechnology of the Australian Society of Cytology** (**CTASC**) is a post-graduate qualification. The aim of the examination is to certify that the successful candidate has demonstrated high level knowledge and competence in the theory and practice of diagnostic cytology. ASC certification is professionally recognised and acknowledged within the pathology industry and by accreditation bodies as a requirement for the practice of cytology within Australia.

The examination tests competence in the performance of regular day-to-day responsibilities of a medical scientist including screening, preliminary diagnosis, diagnostic problem-solving and communication with other health professionals. A comprehensive knowledge of gynaecological and/or non-gynaecological anatomy, histology and cytology in addition to an understanding of the theoretical and practical aspects of specimen collection, preparation, staining, microscopy, special techniques, population screening and quality assurance is required to ensure success. Extensive theoretical and practical study modules (ASC National Cytologist Training Syllabus) are undertaken over a period of at least two years. Two years (post-graduate experience in diagnostic Cytology) is considered an absolute minimum for candidates to acquire the depth of knowledge and experience assessed by the examination.

AWARD ENTITLEMENTS

A "Certificate of Cytotechnology of the Australian Society of Cytology" for "Gynaecological Cytology" and/or "Non-Gynaecological Cytology", as applicable, will be awarded to candidates who successfully pass a CTASC examination. Recipients of both awards will be entitled to use the post-nominal "CTASC" in recognition of this qualification. Gynaecology Cytology CTASC(Gyn) or Non-Gynaecological CTASC(NGyn).

AIMS AND OBJECTIVES

Aims

The aim of the examination is to certify that the successful candidate has demonstrated competence in the theory and practice of diagnostic cytology.

Objectives

i. To provide a professionally recognised certificate of achievement which demonstrates skill, a high level of competence and interest in diagnostic cytology.
ii. To foster continuous improvement in the standard of cytology practice in Australia.
iii. To promote diagnostic cytology and reflect contemporary issues in that discipline.

In setting the examination standard, the Board aims to set a level that is considered to be (the minimum) appropriate for a non-trainee working in a routine diagnostic laboratory in Australia.
The examination will aim to test the routine duties and responsibilities undertaken in the profession of cytology.

Note: Candidates are referred to the "Notes for Mentors" provided in the "Australian Society of Cytology National Cytologist Training Syllabus" for a discussion on competency based assessment and the expected level of knowledge.

PREREQUISITES

To be eligible to sit the examination for CTASC, a candidate must meet each of the following prerequisites.

1. ASC Membership
   Candidates must be financial non-medical members of the Australian Society of Cytology and must have maintained continuous membership of the society for a minimum period of the twenty four months preceding the examination.
2. A candidate must have a tertiary qualification (degree) in medical laboratory science (or its equivalent) issued by an Australian university or equivalent.
   The CTASC examination is directed to graduates of medical laboratory science programs. As such, it is expected that, in addition to cytology, candidates have a background in anatomy, histology and the histopathological basis of disease.
   Applicants with other qualifications may apply to AIMS or NOOSR for an assessment of their qualifications. If these organisations determine that the qualifications are equivalent to an Australian university qualification, as defined above, they may apply to sit for the CTASC provided that all the other prerequisites have been met.

   AIMS
   PO Box 1911
   MILTON Qld 4064
   https://www.aims.org.au/services/qualification-assessment

   Australian Government
   Department of Education and Training
   https://internationaleducation.gov.au/services-and-resources/services-for-individuals/qualifications-assessments/pages/qualification-assessment.aspx
3. A candidate must have at least two years full-time practical experience in cytology, or its part-time equivalent.
   Two years is considered an absolute minimum for candidates to acquire the depth of knowledge and experience across the broad range of topics assessed by the examination. Candidates are encouraged to consider allowing themselves more time to gain the knowledge expected of them prior to presenting for the examination.
4. Gynae Exam: Candidates must have screened a minimum of 4000 gynaecological cases at the time of application.
   The 4000 cases can be composed of unmarked test or training slides as well as routine screening. Marked teaching slides are to be excluded from the total number of slides examined by the candidate.
5. Non Gynae Exam: Candidates are required to have screened a minimum of 2400 non-gynaecological slides at the time of application, comprising a minimum of 400 exfoliative cases and a minimum of 200 FNA cases.
   The 2400 slides can be composed of unmarked test or training slides as well as routine screening. Marked teaching slides are to be excluded from the total number of slides examined by the candidate.

Final acceptance of any application is at the discretion of the Chief Examiner.

VENUES

In 2019 the CTASC examination will be held in Melbourne. This may be subject to change at the discretion of the board.
Candidates are advised that nomination of a venue does not guarantee their acceptance to sit the examination at that venue. The venue will be finalised after receipt of all applications.

CANDIDATE CONDUCT

Candidates are required to follow instructions given by examination supervisors. Disruptive or uncooperative behaviour reported by examination supervisors may result in a candidate's disqualification without appeal, at the discretion of the Chief Examiner. Please note that no dictionaries (including foreign language dictionaries) or mobile phones will be allowed for any of the examinations. Notes and text books are not to be used during the examination.

APPLICATION FORM

The application form is available on the website: www.cytology.com.au

Fees

$500.00 or $750.00 examination fee is required with the application form. Cheques should be made payable to the Australian Society of Cytology Incorporated.

Withdrawal - Refund of Fees

Notification of withdrawal should be in writing. If the application is withdrawn prior to 1 June, there will be a $75.00 administration fee; after 1 June, the fee will be $100.00. If the candidate fails to attend the examination, or withdraws within 48 hours of the examination commencement on the Saturday morning, there will be no refund of the fee.

Photograph

Candidates are asked to supply a colour passport-sized, recent photograph of themselves when lodging their application forms. The photo must be received as a good quality colour scan or printed photograph.

Microscopes

Microscopes will be made available, or candidates may provide their own. Please indicate on the application form if a microscope is required.

Please return your Application Form and certified documents (as specified in the application form) with examination fee and photograph (original, not photocopy) to:

Board of Examiners
Australian Society of Cytology Inc
PO Box 52
HENLEY BEACH SA 5022

or

admin@cytology.com.au

Dates*

These dates are final. There will be no variation.

Closing Date for Applications - 1 March 2019

Confirmation of Application 1 April 2019
Examination: Non Gynae - Saturday 29 June 2019
Gynae - Sunday 30 June 2019

RESULTS AND PRIZE

Results will be emailed by 1 September 2019. NO RESULTS WILL BE GIVEN OVER THE PHONE. All results are sent at the same time.

The top candidate sitting both the Gynae and the Non Gynae examinations in the same year is eligible to be awarded the "Darrel Whitaker Medal". The top candidate in the Gynae examination and the top candidate in the Non Gynae examination are eligible to be awarded the "Top Candidate Certificate". These awards will reflect performance at a distinction level of achievement by the candidate and will be offered subject to the discretion of the Board of Examiners. Award recipients will be offered a prize consisting of one free registration to an Annual Scientific Meeting (ASM) of the Society, to be taken within three years of sitting the examination, however, prizes will be restricted to one per person in any calendar year (ie one free ASM registration per person only). Candidates who successfully pass a CTASC examination will receive a "Certificate of Cytotechnology of the Australian Society of Cytology" for "Gynaecological Cytology" or "Non Gynaecological Cytology", as applicable. Certificates, awards and prizes will be presented at the ensuing Annual General Meeting of the Society, held during the ASM, or mailed later for those not attending the conference.

EXAMINATION REVIEW

A candidate may request that their examination papers and results be reviewed by the Board of Examiners. Application must be made within 6 weeks of the examination results being released. All papers will be destroyed after this period. Examination material will not be returned to candidates under any circumstances.

BOARD OF EXAMINERS

CHAIR:	A/Prof Lyndal Anderson
CHIEF EXAMINER:	Mrs Terese Boost
MEMBERS:	Dr Hema Mahajan
	Ms Jennifer Buckseall
	Mrs Stephanie McKell
	Ms Diana Stockman
	Mrs Julie Weigner

The Board of Examiners can be contacted at:

PO Box 52
HENLEY BEACH SA 5022
admin@cytology.com.au

FORMAT/TIMETABLE

The Gynae and Non Gynae examinations will each consist of three (3) sections (see timetable below). Candidates must achieve a pass in all sections of the paper. Specific guidelines and examples follow.

SATURDAY 29 June 2019 Non Gynae	10:00am – 12:00pm	MICROSCOPY PAPER 10 Non Gynaecological Questions
	1:00pm – 2:00pm	COMBINED MULTIPLE CHOICE & RECOGNITION IMAGE TEST 50 Questions
	2:30pm – 3:30pm	WRITTEN THEORY PAPER 2 Questions
SUNDAY 30 June 2019 Gynae	10:00am – 12:00pm	MICROSCOPY PAPER 10 Gynaecological Questions
	1:00pm – 2:00pm	COMBINED MULTIPLE CHOICE & RECOGNITION IMAGE TEST 50 Questions
	2:30pm – 3:30pm	WRITTEN THEORY PAPER 2 Questions

1. MICROSCOPY SECTION
   Of two hours duration and consisting of ten cases. Twelve minutes are allocated for each case, with a warning given after ten minutes.

2. RECOGNITION IMAGE TEST/MULTIPLE CHOICE THEORY SECTION
   Of 60 minutes duration and consists of 50 multiple choice questions; 25 are theory-based questions and 25 are recognition image test questions.

3. WRITTEN THEORY SECTION
   Of one hour duration (five minutes perusal time will be allowed) and consisting of two questions of equal value. Each of the two questions may consist of several parts of short answer type. Each question, including parts, is compulsory.

2019 CTASC SYLLABUS

The examination aims to test competence in the performance of regular day-to-day responsibilities of a medical scientist including screening, preliminary diagnosis, diagnostic problem-solving and communication with other health professionals.
Candidates are strongly advised to practise both theoretical and practical aspects of the examination under exam-like conditions prior to sitting.

GENERAL

1. Knowledge of the theoretical and practical aspects of specimen collection, preparation, staining and microscopy.
2. An understanding of the principles and applications of special techniques - such as automation, histochemistry, immunocytochemistry and electron microscopy - as relevant to diagnostic cytology.
3. Knowledge is required of:
   - basic cell structure and function, including some knowledge of cell ultrastructure,
   - the normal appearance of cells from various body sites,
   - the morphological changes that occur in disease processes.
4. A detailed knowledge of pathology is not expected, but some understanding of those pathological processes directly relevant to cytological diagnosis is required, including,
   - cell and tissue injury
   - degeneration and necrosis
   - neoplasia
   - acute and chronic inflammation
   - repair and regeneration
   - drug and radiation cellular effects.
5. Knowledge of the principles and practice of quality assurance.
6. An understanding of population screening for the prevention of cervical cancer, particularly as practised in Australia.
7. The emphasis is on the interpretation of those specimens most commonly received in the routine diagnostic laboratory. However, the candidate is expected to be familiar with all types of cytological material, both gynaecological and non-gynaecological appropriate to the exam(s) being sat. Candidates should understand the theory of collection and preparation techniques for all specimen types, including fine needle aspiration (FNA) cytology.
   Knowledge of FNA cytology (including microscopic features) of common entities and less common but classical disorders encountered at sites such as breast, thyroid, lymph node, liver, pancreas, salivary gland and lung is expected.

GYNAECOLOGICAL CYTOLOGY

1. Anatomy, histology and normal cytology of the female genital tract.
2. Hormonal influences on cytology.
3. Infections and inflammation.
4. Benign, non-inflammatory conditions.
5. Human papilloma virus changes.
6. Squamous and glandular precursor lesions of carcinoma of the cervix.
7. Malignant neoplasms of the cervix
8. Normal and abnormal conditions of the endometrium.
9. Other female genital tract neoplasms (vulva, vagina, fallopian tube and ovary).
10. Fluid based preparation methods and interpretation.

NON GYNAECOLOGICAL CYTOLOGY
Anatomy, histology and cytology of normal, benign and malignant conditions of:
1. Respiratory tract.
2. Body cavities and effusions, cyst and joint fluids.
3. Urinary tract.
4. Cerebrospinal fluid.
5. Breast, thyroid, lymph node, liver, pancreas and salivary gland.

Candidates are strongly recommended to refer to the National Training Syllabus developed by the Australian Society of Cytology. It is a very valuable study guide and contains a comprehensive list of reference and resource materials which candidates should utilise during their study. It can be accessed by logging onto the Member's area of the ASC website (https://www.cytology.com.au/ctasc-syllabus). Candidates will not be examined on topics that are not covered in the syllabus.

ASC NATIONAL CYTOLOGIST TRAINING SYLLABUS

Background

1. WH&S, Infection control, Ergonomics
2. Microscope Setup, Use and Maintenance
3. Cell Structure and Function
4. Normal Cell & Tissue types
5. Pathologic Processes - Inflammation and Tumour Spread
6. Cell Changes in Disease
7. Cell Changes Degeneration Fixation and Staining

Gynaecological

8. Specimen Collection, Prep & Staining
9. Anatomy and Histology of Female Genital Tract
10. Normal Cytology of the Female Genital Tract
11. Normal Flora and Infectious Agents
12. Inflammation, Reactive Changes and Tissue Repair
13. Hormonal Cytology
14. Normal Endometrial Cytology
15. Abnormal & Malignant Criteria
16. Screening Technique
17. Screening (Introductory - closely supervised screening)
18. Specimen Adequacy Assessment
19. Etiology and Epidemiology of Cervical Cancer
20. Terminology and Reporting
21. Histology of CIN and Cervical Carcinoma
22. LSIL (Minor Squamous Changes, HPV, CIN1)
23. HSIL (CIN2, CIN3) and SCC
24. Endocervical Abnormalities, AIS and Endocervical Adenocarcinoma
25. Endometrial Adenocarcinoma

Gynaecological (cont)

26. Radiation Effects
27. VAIN, VIN
28. Rare, Non-uterine, Non-Epithelial and Metastatic Tumours
29. Adjunct Testing: Semi-automated Screening Devices, LBC and HPV Testing
30. Adjunct Testing: Automation
31. Colposcopy & Management of Abnormalities
32. Screening Accuracy, Sources of Error, QA and Regulation
33. Current Issues in Screening and Cytology
34. Screening (Advanced - supervised routine screening

Non-gynaecological

35. Specimen Collection Preparation and Staining
36. Respiratory Cytology
37. Supervised Routine Slide Exam (Part 1)
38. Urinary Tract Cytology
39. Effusion Cytology
40. FNA Cytology
41. FNA Breast
42. FNA Thyroid
43. FNA Salivary Glands
44. Cerebrospinal Fluid Cytology
45. FNA Lymph Nodes
46. Ovarian Cyst Cytology
47. Quality Assurance
48. Current Issues in Non-Gynaecological Cytology
49. Supervised Routine Slide Exam (Part 2)
50. FNA Liver
51. FNA Pancreas

GUIDELINES FOR REPORTING GLASS SLIDES

Each microscopy exam is of two hours duration and consistsing of ten cases. Twelve minutes are allocated for each case, with a warning given after ten minutes. At the conclusion of the allotted time, candidates are required to stop working on the current case (both microscopy and writing), and to promptly pass the slide(s) to the next candidate. Candidates may recommence on the instruction of the examination supervisor.
Candidates must screen each slide and provide a written report. The report must include a diagnosis and a description of the cytological features upon which the diagnosis is based, with marks awarded for both the diagnosis and description. Provision is made for comments and recommendations where appropriate. Answers must be clearly legible. Attention should be given to correct spelling and grammar, particularly with regard to technical language.
The cases used in the examination are selected to represent a specific diagnosis, entity or presentation. It is expected that candidates provide a definitive diagnosis. It is recognised that circumstances exist in non-gynaecological cytology where a departure from normal appearances can be recognised, but a definitive benign / malignant classification is not possible. For such cases, candidates are expected to submit a report consistent with usual reporting practices.
The description should reflect the contents of the slide and should support the specific diagnosis. Candidates are required to identify the various cell types present and provide a more detailed description of the features of:

- pathogens
- benign cellular changes,
- abnormalities and
- cells scrutinised to exclude an abnormality, even if those cells are ultimately determined to be a normal component.

Candidates are permitted no more than two diagnostic errors (false positive, false negative or indecisive) in each of the microscopy examinations.

GYNAECOLOGICAL SPECIMENS

Reporting Format:

Candidates should report gynaecological specimens using the Australian Modified Bethesda System (AMBS 2004). The answer sheet is structured to assist candidates in formatting the report.
The terminology and examples can be found in the NHMRC Guidelines "National Cervical Screening Program: Guidelines for the management of screen-detected abnormalities in specific populations and investigation of abnormal vaginal bleeding (NHMRC 2017)".

Specimen type and site

Indicate SurePath versus ThinPrep.
Indicate the site of origin of the specimen.

NB. Candidates should select the preparation (ThinPrep or SurePath) best suited to their experience. It is recommended that the candidate screens only one (1) of the two (2) slides provided in the allotted time of 12 minutes.

Category of results

A one line category / result. This should include a broad category for the diagnosis (e.g. High-grade squamous intraepithelial lesion) Categories should correspond to those recommended by the AMBS 2004.

- **Unsatisfactory**
- **Negative**
- **Squamous abnormalities**: Possible low-grade squamous intraepithelial lesion, Low-grade squamous intraepithelial lesion, Possible high-grade squamous lesion, High-grade squamous intraepithelial lesion, Squamous cell carcinoma.
- **Glandular abnormalities**: Atypical endocervical cells of undetermined significance, Atypical glandular cells of undetermined significance, Possible high-grade glandular lesion, Endocervical adenocarcinoma-in-situ, Adenocarcinoma.

Slide Description and Specific Diagnosis

Candidates are required to provide a description of the slide's contents.

- **Description and Diagnosis**: The description should reflect the contents of the slide and should support a specific diagnosis. The specific diagnosis should be as precise as possible. For squamous abnormalities the CIN terminology is preferred. Where possible the differentiation of malignant cases and the origin of glandular malignancies in cervical specimens (eg endocervical, endometrial) should be designated.
- **Endocervical Component**: A statement regarding the presence or absence of an endocervical component is required for cervical specimens.
- **Specimen Adequacy**: The AMBS (2004) now only requires a comment regarding inadequacy. The reasons for classifying cases as inadequate should be clearly stated.

Risk Category and Management Recommendation

A risk category and management recommendation, in line with the NHMRC guidelines (see reference) should be included for all cases, where appropriate.

Descriptive Report

General Features: Background
Inflammation
Hormonal Pattern - If incompatible with age and/or history.
Squamous population
Presence / Absence of endocervical cells
Presence / Absence of squamous metaplasia
Presence / Absence of endometrial cells
Organisms

Specific features of cells scrutinised:

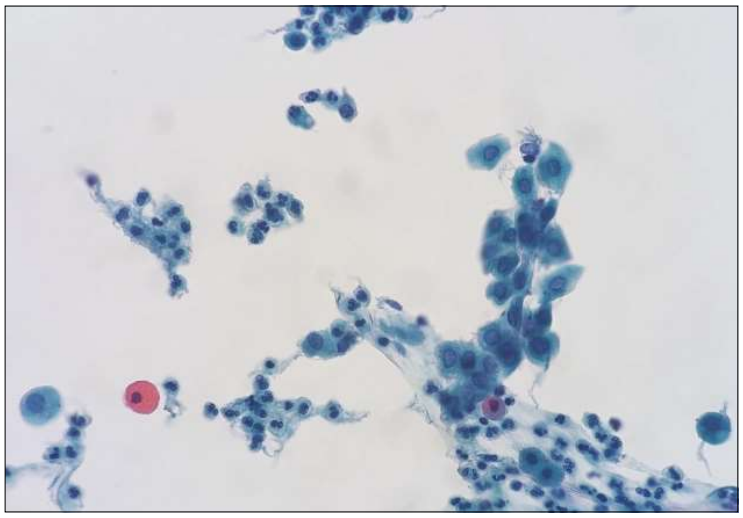
Cellular Arrangement / Architecture:	Single, sheets, clusters, syncytial-like, papillary / acinar arrangements
Cell:	Size, shape, borders
Cytoplasm:	Stain, texture, density, vacuolation
Other Features:	Mucin, cilia, keratinisation
Nucleus:	Size, shape, N/C ratio, position of nucleus, chromatin pattern, nuclear membrane
Nucleoli:	Number, size, position

Examples of Satisfactory Descriptions

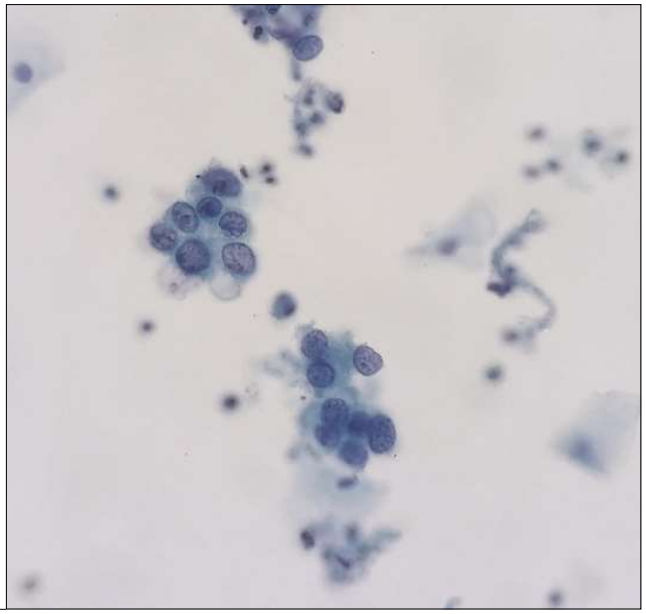
Note that the examples:

a) describe the specimen background,
b) identify the cells present, and
c) provide a more detailed description of the diagnostic features.

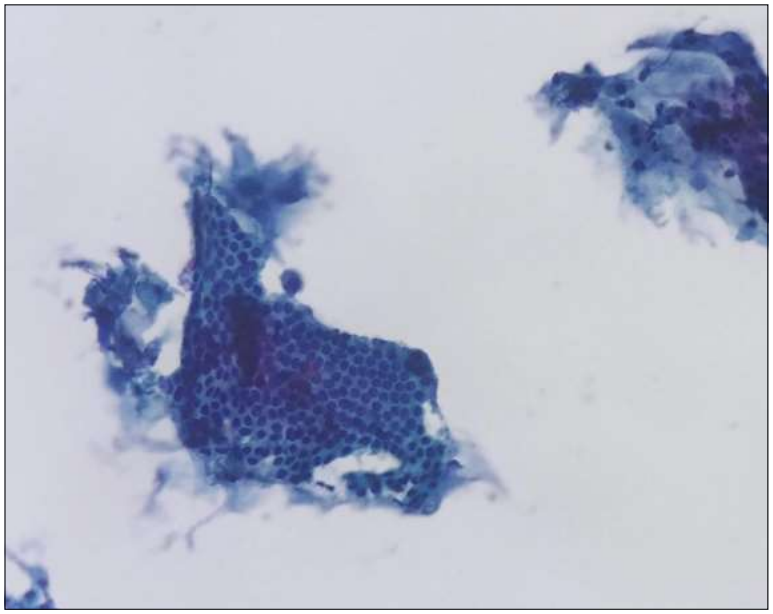
SLIDE NO 1
Cervical Specimen, 52 year old
HPV detected (not 16/18)
Category (Result)
Negative for intraepithelial lesion or malignancy.
Descriptive Report
Atrophic specimen with a background of inflammation and proteinaceous material. An endocervical component has not been detected. Parabasal cells are seen as single cells and in small groups displaying uniform central nuclei. Occasional cells have pyknotic nuclei and eosinophilicor orangophilic cytoplasm. No cellular evidence of neoplasia.
Risk Category and Management Recommendation
Intermediate risk. Repeat HPV test in one year.



SLIDE NO 2
Cervical Specimen, 34 year old
HPV 18 detected.
Category
High-grade squamous intraepithelial lesion:
Descriptive Report
Flora normal. Inflammation is mild and there is a clean background. Hormonal pattern compatible with age. An endocervical component is present. There are aggregates and single abnormal squamous cells throughout the specimen. The cells are round to polygonal in shape with high N/C ratio. Cytoplasm is basophilic and variable in density. The nuclei vary in size and shape. Some have an irregular outline and a coarse chromatin pattern. Occasional bare nuclei are present.
These changes are consistent with Cervical Intraepithelial Neoplasia grade III.
Risk Category and Management Recommendation
Higher risk. Refer for colposcopic assessment.



SLIDE NO 3
Cervical Specimen, 36 year old
HPV detected (not 16/18).
Category
Unsatisfactory
Diagnosis
There are insufficient squamous cells
Descriptive Report
The background contains abundant mucin. An endocervical component is present. Numerous endocervical cells are present and these occur both singly and in large sheets. The sheets display a honey comb arrangement with granular cytoplasm. The chromatin is finely granular with occasional small nucleoli. There are only scant intermediate squamous cells which are insufficient in number for evaluation.
Risk Category and Management Recommendation
Unsatisfactory. Repeat Cytology only in 6 weeks.



NON-GYNAECOLOGICAL SPECIMENS
Candidates are expected to assess the following points when screening a slide and describe those considered relevant to the diagnosis. The descriptive report should reflect the contents of the slide and should support the diagnosis.

General Features:
Quality of Specimen
Comment if the specimen is not satisfactory. (This applies especially to specimens from the respiratory tract.)

Inflammation	Cell type, amount
Micro-organisms	Identify and describe organisms considered clinically significant Bacteria, fungi, protozoa, parasites, viral changes
Background	
Cell content	Identify the usual cellular elements of the specimen

Specific features of cells scrutinised:

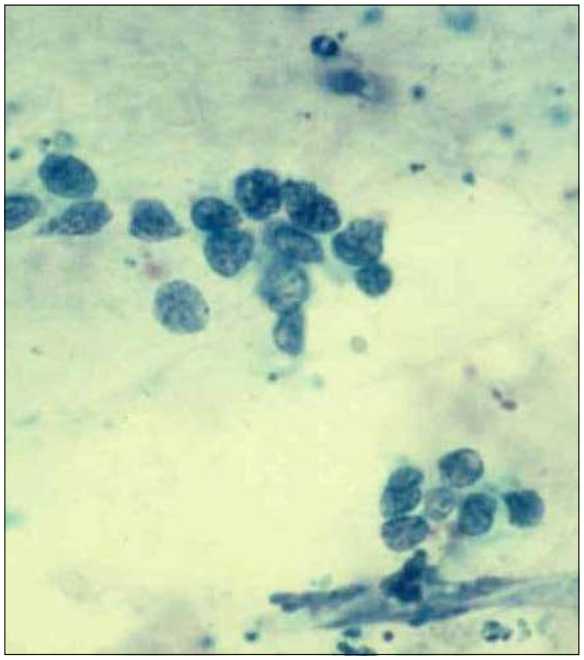
Cellular Arrangement / Architecture:	Single, sheets, clusters, syncytial-like, papillary / acinar arrangements
Cell:	Size, shape, borders
Cytoplasm:	Stain, texture, density, vacuolation
Other Differentiating Features:	Mucin, cilia, keratinisation
Nucleus:	Size, shape, N/C ratio, position of nucleus, chromatin pattern, nuclear membrane
Nucleoli:	Number, size, position

Diagnosis:
Where possible the differentiation of the lesion (if malignant) should be designated.

Comment: (Where applicable)
This might include a discussion of a differential diagnosis if appropriate - however, a decision should still be made regarding the slide.
Provide information regarding any additional tests and their results which could aid in the diagnosis. e.g. special stains, immunocytochemistry and electron microscopy. This is not necessary if a confident diagnosis is possible on cytology.

Examples
Note that the examples:
a) describe the specimen background,
b) identify the cells present, and
c) provide a more detailed description of the diagnostic features.

SLIDE NO 1
Bronchial Washing, Male, Age 63 years



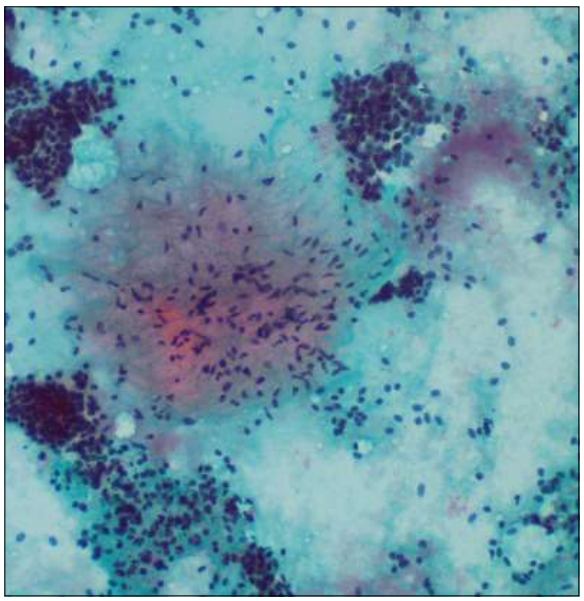
Diagnosis
Small cell carcinoma.

Adequacy
Adequate specimen.

Descriptive Report
Degenerate blood is scattered throughout the background with nuclear debris evident around the cell groups. Inflammation is minimal. Cells / nuclei are arranged in loose disintegrating syncytial-like groups. Cytoplasm is either very scanty or absent. The nuclei show size and shape variation with evidence of nuclear moulding. The chromatin is very coarse and irregularly distributed. Pulmonary macrophages and bronchial columnar cells are also noted.

Comment
Not applicable

SLIDE NO 2
FNA Breast, Female, Age 32 years



Diagnosis
Benign – Consistent with fibroadenoma

Descriptive Report
The specimen is highly cellular. Large, branching sheets of cohesive ductal epithelial cells are present. The sheets of ductal cells are orderly, with minimal crowding. The cytoplasm is delicate. Nuclei are round to oval with smooth membranes and finely granular chromatin. Nucleoli are evident.
A bimodal pattern is noted, with myoepithelial cells overlying the sheets of ductal cells. Numerous bare, bipolar nuclei occur throughout the specimen background. Stromal tissue fragments are identified.

Comment:
Not applicable

GUIDELINES FOR THEORY PAPERS

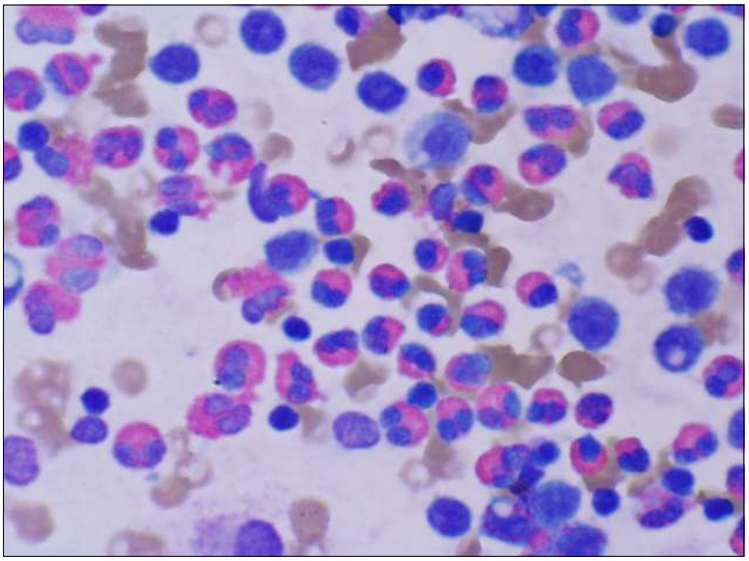
The pass mark for each theory component of the examination is 50%.
In response to candidate enquiries, examples of questions from past papers are provided.

Recognition Image Test

Each question is based on an image of an object, situation or microscopic material. Most questions require that the candidate examine the image and, having correctly interpreted the image, answer a multiple choice question related to that image, as per the examples below:

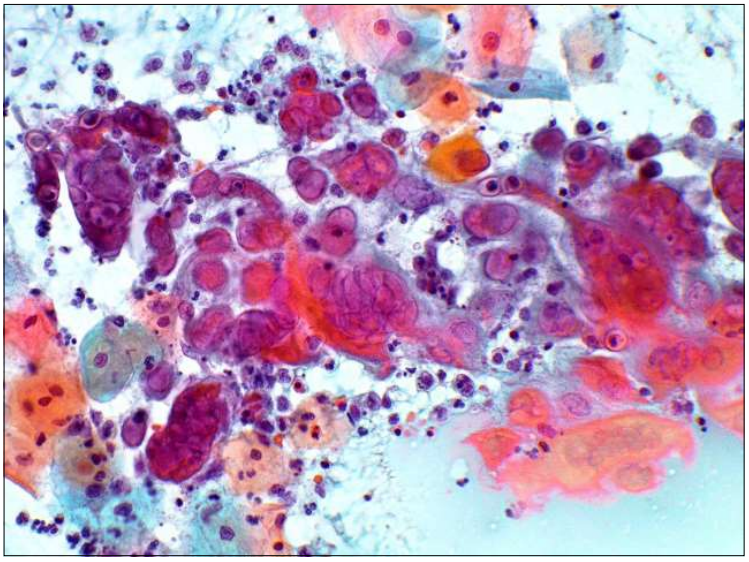
PLEURAL FLUID (GIEMSA STAIN)
These cells when detected in increased numbers in a pleural effusion are usually:

a. Of unknown causation
b. Suggestive of a parasitic infection
c. Suggestive of a hypersensitivity reaction
d. Suggestive of asthma
e. Suggestive of Hodgkin's lymphoma



CERVICAL SPECIMEN (PAPANICOLAOU STAIN)
The patient is 28 years of age and pregnant. Which of the following statements is correct?

a. The patient is at risk of choriocarcinoma.
b. There is an increased risk of miscarriage.
c. The patient should undergo immediate colposcopy with definitive treatment deferred until after delivery.
d. Vitamin supplementation should be recommended.
e. Delivery by caesarean section may be indicated.



Multiple Choice Theory Paper

Large numbers of eosinophils found in a sputum sample are most often associated with:

a. Asthma
b. Pneumothorax
c. Parasitic infection
d. Bronchitis
e. Pneumonia

Which of the following cells may be confused with an endometrial stromal cell?

a. Endocervical
b. Eosinophil
c. Parabasal
d. Histiocyte
e. Trophoblast

Written Theory Paper

Five minutes perusal time is allowed prior to commencing the paper. During this time, candidates may make notes on the question paper. Writing in the answer booklets during the perusal time is not permitted. One hour is permitted for the examination.

In response to enquiries concerning the level of approach candidates should adopt when preparing for the written theory paper, the questions from two past papers are provided. Examples of satisfactory answers that were submitted by candidates are also provided for two questions from previous examinations. Future candidates and their mentors may find these to be a useful guide when studying and practising exam-writing techniques.

CTASC EXAMINATION
2018
WRITTEN THEORY PAPER

GYNAE QUESTION 1

a. Write brief notes on multinucleated cells in cervical samples.
b. List the four (4) reporting categories for the Renewed Cervical Screening Program. Describe two (2) scenarios in which each may be used and the follow-up recommended.
c. Describe the cytomorphologic features of three pathogens which may be found in cervical specimens and the inflammatory changes that may be seen.
d. Describe the features of benign vs malignant endometrial cells in liquid-based cytology.
e. List three (3) possible reasons for unsatisfactory liquid-based cytology and solutions for how these may be resolved.

GYNAE QUESTION 2

Discuss the origins of hyperchromatic crowded groups in cervical specimens. Describe cytologic features of two (2) benign and two (2) malignant entities and explain how each may be differentiated from the others.

NON GYNAE QUESTION 1

a. Discuss reasons for false negative breast FNA.
b. Discuss the significance of lymphocytes in CSF.
c. Discuss further testing which may be required for Lymph Node FNA after examination of the direct smears.
d. Describe one (1) benign and two (2) malignant entities which may be found in salivary gland.
e. Define three different specimen types that are used to cytologically examiner the urinary bladder. Compare and contrast the microscopic appearances of these specimens.

NON GYNAE QUESTION 2

1.2 litres of fluid is removed from the pleural cavity of a 60 year old female.

- Describe the various possible preparation methods for cytological assessment.
- The specimen shows numerous small single cells. List five (5) possible differential diagnoses and discuss three (3) of these.

CTASC EXAMINATION
2017
WRITTEN THEORY PAPER

GYNAE QUESTION 1
Small single cells in cervical specimens have many origins. Discuss these and include problems in the differential diagnosis with cervical intraepithelial neoplasia.

GYNAE QUESTION 2
a) Briefly discuss the importance of adequate fixation of a cervical sample.
b) Describe the cytomorphological features of Herpes Simplex virus infection and associated cellular changes in a cervical specimen.
c) Write brief notes on the significance of:
   i. Bare nuclei
   ii. A positive/detected HR HPV test
   iii. A false negative cervical specimen report
d) List the extrauterine malignancies that may be identified in a cervical specimen and describe the cytological features of any one of these.
e) Briefly discuss the current recommendations for the management of a woman whose specimen shows LSIL.

NON GYNAE QUESTION 1
The neck is a region which is frequently investigated using fine needle aspiration technique.
Discuss:
- The advantages of using FNA to investigate masses in this region,
- Detail sites that are most frequently sampled and,
- The role ROSE (rapid on-site examination) has to play in specimen collection.

Compare the cytological features of two entities that may present a difficult differential diagnosis in the neck region, and discuss ancillary tests that support/assist in the diagnosis.

NON GYNAE QUESTION 2
a) Discuss the morphology of one type of well-differentiated carcinoma and carcinoid tumours of the lung and ancillary tests to confirm these.
b) Provide a cytological description of three common infections encountered in respiratory specimens from immunocompromised patients.
c) Describe and discuss the collection and cyto-preparatory methods for a voided urine.
d) Describe the cytologic features differentiating malignant mesothelioma and metastatic adenocarcinoma in a pleural fluid. List and give the results of immunocytochemical stains which could assist with the differentiation.
e) Discuss the cytological features used to diagnose two malignant entities of the thyroid.

SATISFACTORY ANSWER (1)

Question: Discuss the role of Fine Needle Aspiration cytology as part of the triple test of a screen detected breast lesion (palpable and non- palpable). Your answer should include the cytological features of common entities.

Fine needle aspiration (FNA) cytology plays a feature role in the triple test for screen detected lesions, both palpable and non-palpable. FNA may be performed under radiological guidance for non-palpable lesions or directly with palpable lesions.

The triple test involves:

Clinical examination

Radiological examination (mammogram, ultrasound)

Pathological examination (cytology and histology)

To enable the test to be successful and more accurately interpreted, strong co-operation between the clinician, radiologist and pathologist is necessary. The triple test approaches high levels of sensitivity and specificity when all three procedures are combined. When all procedures are malignant, the likelihood of a malignant lesion is > 99%. If all the parameters are benign, the likelihood of a woman having breast cancer is < 1%. However, if results are discordant, surgical biopsy is required to resolve the diagnosis. The chance of a woman having breast cancer is significantly increased if one of the modalities is suspicious of malignancy.

All three disciplines use versions of the following categories.

1. Technically unsatisfactory
2. Benign
3. Atypical - indeterminate
4. Suspicious - favour malignant
5. Malignant

The reporting categories for different lesions should also be fairly consistent in order to achieve a successful outcome.

The accuracy of the FNA cytology is dependent upon the experience of the pathologist and the quality of the aspiration. Accuracy increases when the pathologist performs the aspiration for palpable lesions, or is present to assess the cellularity of the aspiration obtained radiologically.

Limitations associated with FNA include:

- High inadequacy rates
- Inability to differentiate between in-situ and invasive ductal carcinoma
- Difficulty in diagnosing low grade carcinomas (eg low grade ductal CIS, tubular carcinoma),
- Inability to diagnose specific benign lesions
- Difficulty in diagnosing when nuclear atypia is present, and
- Difficulty in differentiating papillary and proliferative lesions.

FNA cytology of non-palpable lesions has largely been replaced by core biopsies. Core biopsies have fewer limitations and are more confidently interpreted by most pathologists.

Benign lesions

Common presentations include:

CYSTS

- Often low cellularity
- Macrophages
- Apocrine cells (apocrine metaplasia), either in sheets or singly.
  - ♦ The distinguishing feature of apocrine cells is their abundant dense finely granular cytoplasm.
- Inflammatory cells (variable)
- Cyst debris

Any residual mass should be aspirated

FIBROADENOMA

- High epithelial cellularity
- Sheets of cohesive ductal epithelium
- Stag-horn like branching groups of ductal epithelium
- Bare bipolar nuclei (myoepithelial cells) in background and within epithelial groups
- Fragments of fibrotic or fibromyxoid stroma

Atypical fibroadenomas may be difficult to interpret.

FIBROCYSTIC CHANGE
Very common disease in women, but not always able to be specifically diagnosed in FNA specimens
- May have low or high epithelial cell yield:
- Flat regular ductal sheets
- Sheets of apocrine metaplasia
- Myoepithelial cells within epithelial groups
- Bipolar nuclei in the background
- Foam cells /macrophages

PAPILLARY LESIONS
Cytology cannot accurately differentiate intraductal papillomas/florid papillomatosis from papillary carcinomas. Formal excision should always be recommended.
Features include:
- Cellular specimens
- Branching epithelial and finger-like fragments
- True papillary fragments with a fibrovascular core maybe present
- Palisading columnar cells
- Macrophages
- Bare bipolar nuclei (variable)

Malignant lesions
DUCTAL CARCINOMA
- High cellularity
- Loose cohesive groups
- Syncytial groups with loss of polarity
- Single cells with intact cytoplasm
- Absence of bare bipolar nuclei
- Enlarged nuclei with raised N/C ratio, irregular nuclear membranes & hyperchromasia
- Nucleoli may be prominent
- Tumour diathesis may be present

FNA cytology cannot generally differentiate DCIS from an invasive lesion.

Features seen with DCIS, comedo type are:
- Moderate to high cellularity
- Irregular fragments and single cells
- Macrophages
- Tumour debris

Features of DCIS, non-comedo type have no diathesis

LOBULAR CARCINOMA
Account for 5-10% of invasive lesions
- Scant to moderate cellularity
- Single cells, small groups inc. linear arrangements
- Intracytoplasmic lumens, mucin vacuoles, signet ring cells
- Cytoplasm may be scanty
- Nuclei are small with variation in size and chromasia
- Nuclear moulding
- Presence of small nucleoli
- No bipolar bare nuclei.

In conclusion, FNA cytology is a useful tool in the diagnosis of screen detected lesions. However, superior results associated with stereotactic core biopsy for non-palpable lesions have resulted in FNA cytology being largely replaced in many diagnostic centres (eg England). In the hands of experienced radiologists and pathologists it is a fast, simple safe, cost effective and accurate test. The limitations of FNA cytology always need to be acknowledged.

SATISFACTORY ANSWER (2)
QUESTION

a. List the four (4) reporting categories used in the Renewed Cervical Screening Program. Describe two (2) scenarios in which each may be used and the recommended follow-up for each.
b. Outline the advantages and disadvantages of the Royal College of Pathologists of Australasia Quality Assurance Program's gynaecological slide rotation.
c. Describe the cytomorphological features of Candida sp and associated cellular changes in conventional cervical specimens. Briefly outline the look-alikes.
d. Describe the morphological features used to distinguish between adenocarcinoma in-situ of the endocervix and directly sampled lower uterine segment.
e. List three (3) possible reasons for unsatisfactory liquid-based cytology and discuss how these may be resolved.

(a)
Unsatisfactory

1. the HPV test is invalid.
   - repeat cervical screening test in 6 weeks.
2. the HPV test is either negative, or positive for HPV other than 16/18 and the LBC slide is unsatisfactory.
   - repeat LBC only in 6 weeks.

Low Risk

1. a primary screening test with a negative HPV result.
   - repeat cervical screening test in 5 years.
2. Second Test of Cure: a negative HPV + LBC following a previous negative HPV + LBC for a patient who has had a previous biopsy confirmed high grade lesion.
   - repeat cervical screening test in 5 years.

Intermediate Risk

1. a primary screening test when the HPV test is positive for HPV Other and the LBC is either negative, PLSIL or LSIL.
   - repeat cervical screening test in 1 year.
2. a co-test for a symptomatic patient when the HPV is positive for HPV Other, OR the LBC is PLSIL or LSIL.
   - refer for Colposcopic assessment.

High Risk

1. a primary screening test which is positive for HPV 16 or 18, regardless of LBC result.
   - refer for Colposcopic assessment
2. persisting HPV positivity – when a 12 month follow-up after HPV Other is still positive for HPV Other.
   - refer for Colposcopic assessment.

(b)
Advantages:

- allows all labs to gain exposure to material they may not routinely get in their lab.
- allows a method for RCPA to examine labs and assess if consistency is happening form lab to lab.
- allows results to be used as further teaching within labs as results may be obtained very quickly.
- allows RCPA to assess potential areas of continued education.
- allows labs to compare themselves against other labs.
- allows labs to assess work being signed out by their screeners & pathologists.
- allows detection of problem areas & allows continuing education to be done on those problem areas.
- aids in calculation & adherence to 'performance measures'.

Disadvantages:

- reporting may be done under non routine conditions and therefore give unrealistic results
- expensive and complicated to run.
- may not be beneficial for individual screeners in big labs as they may only see one QAP every 5 years.
- may be insufficient to really test a laboratory

(c)
Candida is a dimorphic fungus growing as both fungal and hyphal elements. The fungal spores are small and round, often with budding and may appear singly or in clusters. Pseudohyphae can appear as segmented filaments with branching chains of elongated buds. These can often appear as hyphal spearing through epithelial cell clumps as "kebab effect". Staining is usually pale pink with Pap staining.
Candida associated changes include nuclear enlargement and increased cytoplasmic eosinophila, vacuoles (moth-eaten cytoplasm) and perinuclear clearing. An inflammatory exudate may be seen. These changes may also be seen with Trichomonas infection. Changes of nuclear enlargement and perinuclear haloes may also be mistaken for LSIL (koilocytes).
Look alikes of Candida sp may include:

- Degenerate red blood cells (yeast forms)
- Mucus strands may be mistaken for hyphae but lack segmentation
- Leptothrix – thin filamentous bacteria, but lack segmentation
- Fungal contaminant e.g. Aspergillus sp but has "true" septate hyphae and conidiophores that Candida lacks.
- Actinomyces sp. – furry balls with radiating filamentous structures

(d)
Directly sampled lower uterine segment (LUS) cells are an important differential in the diagnosis of adenocarcinoma in-situ (AIS) of the endocervix, the comparative morphological features can be described in the following categories:

	LUS	**AIS**
Cytoplasm	Inconspicuous	Abundant, feathering at edges of groups
Cell shape	Small, round or oval	Columnar to cuboidal
Nuclei	Round-oval, finely granular, uniform	Elongated, fine-coarse chromatin, hyperchromasia, peripheral, anisonucleosis, crowded, pseudostratified
Arrangement	Small and large groups, tubules, sheets, cohesive (stroma and glands, biphasic)	Isolated strips, strips off sheets, rosettes, crowded groups – piling up of cells
Stroma	Present, capillaries in larger fragments	Absent

(e)
A liquid-based cytology slide requires a minimum of 5000 well preserved, well-visualised squamous cells.
Three reasons for unsatisfactory liquid based cytology include excess blood, the presence of lubricant in the specimen and extreme atrophy.
Excess blood may result from a contact bleed while the doctor is taking the specimen, or it may be of menstrual origin or possibly as a result of an invasive lesion. Excess blood can clog up a ThinPrep filter. This problem may be remedied by reprocessing the specimen after a glacial acetic acid wash, which lyses the red blood cells. Acetic acid may also help with specimens containing a lot of mucus.
Lubricants containing carbomers may also clog the ThinPrep filter and result in an unsatisfactory slide. Acetic acid treatment does not remove lubricant so the specimen needs to be repeated. The doctor should use a carbomer-free lubricant and avoid putting lubricant on the tip of the speculum.
Excess blood and lubricant do not present a problem for SurePath processing because they are removed by the density gradient technique.
Sometimes, extreme atrophic change can make abnormal cells difficult to identify, due to the presence of many hyperchromatic crowded groups. It is recommended that the patient use a course of local oestrogen for a week, before another smear is taken. The oestrogen will cause the cervical epithelium to become more mature.

MARKING

Candidates are required to achieve a pass in each section (Microscopy, Written Theory and Recognition Image Test/Multiple Choice).
The **Multiple Choice** and **Recognition Image Test** papers are marked at the national office and checked by the Chief Examiner. Pass mark for the combined paper is 50%.
The **Microscopy Paper** comprises 10 questions. Markers work in pairs and assess two questions each. Therefore, any given candidate is assessed by a minimum of ten assessors. Marks are allocated out of 10 (per assessor) with the breakdown as follows:

Description	4
Diagnosis	5
Comment	1

Marks from each assessor are added. The total mark possible for an individual microscopy question is 20.
Pass mark for a microscopy question = 50%. Failing more than 2 questions is considered a fail in the microscopy examination.
The **Written Theory** paper is marked by 1 marking pair per question. Each question is worth 50.

The Examiners are sourced from a variety of state branches of the ASC and work in pairs that include a Cytopathologist and a Senior Cytologist and include representatives from the Board of Examiners.

Total Raw Mark	Number of Questions	Value	Total marks
Microscopy	10	20	200
Multiple Choice	25	2	50
Recognition Image Test	25	2	50
Written Theory	2	50	100
TOTAL marks per candidate			**400**

- Failing the microscopy section constitutes an outright failure of the examination.

Exceptions: If a candidate achieves greater than 75% in the microscopy section, but fails either the theory or multiple choice/recognition image test by up to 5% (i.e. 45% or more), a pass will be granted.

Distinctions: Obtaining 75% or greater overall will constitute a pass with distinction.
The candidate with the top mark out of 400 in the combined (Gynae and Non-Gynae) examination may receive the Darrel Whitaker Medal, at the discretion of the Board of Examiners.

Notification of Failure
Candidates who fail the examination will be notified of the total result as well as the specific areas in which they were unsuccessful.

APPENDIX 1 - HISTORY OF THE EXAMINATION 1975-1992

The inaugural Annual General Meeting of the Australian Society of Cytology was held in Perth in 1970 with Dr Michael Drake as the elected President and 40 persons listed as potential members.
At the 1972 annual general meeting, Dr Drake advocated the establishment by the Society of a qualification for cytotechnologists. A motion was carried empowering the executive committee with co-opted members to establish an education subcommittee.
The international tutorial in 1973 intervened and no action was taken until the 1974 Annual General Meeting. At that time the following motions relating to cytotechnology qualifications were passed:

i. That the Australian Society of Cytology establishes a qualification for cytotechnologists to be known as the CTASC, i.e. the Certificate of Cytotechnology of the Australian Society of Cytology.
ii. That an annual examination be held for this qualification and that to be eligible to take this examination, candidates must have had a minimum of three years' full-time experience in cytology or its part-time equivalent except in the case of a person holding a tertiary qualification (such as BSc, Diploma in Medical Laboratory Technology or equivalent) with adequate experience in biological sciences.
iii. That the society establishes a committee which will be responsible for conducting the annual examinations, determining the eligibility of candidates, advising on preparation for the examination and generally assisting in maintaining the standard of cytotechnology training throughout Australia.

The first examination was held in 1975 and has been held annually ever since. Since 1975, 564 candidates have sat for the examination and 460 have been successful, an overall pass rate of 81.5%.
The Society, especially the inaugural Executive, considered its highest priority the establishment of a national examination. Mrs Meg Swaffield was co-opted and together with the executive committee comprised the first examination committee. This mode of operation - the executive committee and co-opted cytotechnologists/ cytologists - has continued through until the 1993 CTASC examination.
In his 1976 Presidential address, Professor Robert Barter made reference to the need for formal educational requirements for entry into the field of cytology and that it is the responsibility of the Society to be involved with institutions of tertiary education for cytology training. However, it was not until the 1987 annual general meeting in Adelaide that it was agreed that the current entry criteria, as set down at the 1974 meeting, were due for revision.

In 1989, the following were set down as interim CTASC prerequisites to be reviewed in 1992:
To be eligible to take the CTASC examination, candidates must have

d. A Certificate or Diploma in Medical Laboratory Techniques (or its equivalent) with at least two (2) years full-time practical experience in Cytology (or its part-time equivalent).
or
e. Hold a tertiary degree (Bachelor of Applied Science in Medical Laboratory Techniques or its equivalent) with at least one (1) year's full-time practical experience in Cytology (or its part-time equivalent).

Those who have had on-the-job training in the past and with three (3) years' full-time practical experience in Cytology (or its part-time equivalent) will be eligible to sit until and including 1992.
At the 22nd Annual Meeting in May 1992, the CTASC prerequisites were amended to the following:
"To be eligible to sit the examination for the Certificate of Technology (Australian Society of Cytology) from 1993, a candidate must have a degree, diploma or certificate in medical laboratory science (or its equivalent) and at least two years full-time practical experience in cytology (or its part-time equivalent).
The Examination Committee will review specific details of qualifications and practical experience before a final decision is made on the eligibility of an individual candidate.

In addition, the Constitution of the Society was amended by adding the following article:
Article 20A - BOARD OF EXAMINERS

a. The Council shall have the power to appoint examiners to constitute a Board of Examiners for the purpose of examining candidates for such certificates diplomas or other awards of the Society as shall from time to time be determined by a simple majority of a general meeting or plebiscite of members.
b. The President or his delegate shall be Chairman of the Board of Examiners.
c. The Council may make by-laws defining the powers of the Board of Examiners and prescribing rules for its procedures.

Conclusion

In the last six years alone, 282 candidates have submitted for the examination (half of the 19 year total). This dramatic increase corresponds to a similar increase in the membership of the Society and is indicative of the changes in the discipline of cytology since 1975.
In particular, these include:

the role of NATA/NPAAC accreditation since 1987
industrial recognition of the certificate in some jurisdictions
government involvement in and funding of cervical and breast cancer screening programmes
greater interest in the discipline due to the increasingly widespread practice of fine needle aspiration
increasing levels of diagnostic skill in cytology.

The role of the qualification has been to certify competence of cytology staff, scientific and technical, working in routine cytopathology, and has been readily achievable by cytologists from throughout the nation.
In light of the many changes, advances and increasing interest both in cytopathology and education since the inaugural CTASC examination in 1975, it is timely that a Board of Examiners is established in 1993 to review the examination in light of current practice.

PHILOSOPHY

The original aim was to create a medium for stimulating interest in the discipline of diagnostic cytology, provide a certificate of competence and achievement particularly for those cytotechnicians lacking formal qualifications and to achieve a uniform standard of cytology throughout Australia.
The examination has always been conducted by a committee comprising senior medical and non-medical members of the Society. It was felt that the role of senior non-medical members in setting the examination should reflect the roles and responsibilities that cytotechnologists accept within their routine work. Accordingly the examination is a “mastery” (rather than a “discrimination”) examination which all competent candidates should pass.
References:
Annual General Meeting minutes
1976 & 1986 President’s Reports
Correspondence: Dr D Whitaker, Dr J Grace, Mr E Wilson and Dr B Wadham

APPENDIX 2 - HISTORY OF THE EXAMINATION 1992-2018 (PENDING)

The examination was split into Gynaelogical/Non Gynaelogical for the first time in 2016. The Gynae slide examination for 2016-18 included three slides (ThinPrep, SurePath and conventional) with the conventional slides being discontinued from the 2019 examination.