



Western Cape  
Government

Health



**Manual for Interns and Doctors 2014**  
Tygerberg Hospital

**Manual  
for Interns and Doctors**

**Tygerberg Hospital**

**2014**

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### **CLINICAL DEPARTMENTS**

Department of Anaesthesiology and Critical Care  
Department of Family Medicine and Primary Care  
Department of Forensic Medicine  
Department of Gynaecology and Obstetrics  
Department of Internal Medicine  
Department of Medical Imaging and Clinical Oncology  
Radiology Division  
Nuclear Medicine Division  
Department of Psychiatry  
Surgical Department  
Department of Paediatrics and Child Health  
Unit for Infection Prevention and Control

### **AUXILIARY SERVICES**

Department of Human Nutrition  
Occupational Therapy Division  
Pharmacy  
Physiotherapy Division  
Department of Speech Therapy and Audiology  
Social Work Division

### **NHLS TYGERBERG BUSINESS UNIT:**

SPECIMAN SAMPLING MANUAL

## WELCOME TO TYGERBERG HOSPITAL

To all new doctors: Interns and Medical Officers

On behalf of the Management of Tygerberg Hospital, I wish to extend a very warm welcome to you, our new Interns and Medical Officers. It is of great significance to us, that you have chosen Tygerberg Hospital to further your medical careers.

Tygerberg Hospital is a large and complex organisation, with an establishment of approximately 4 400 staff members. The prospect of working here may seem daunting, but be assured that we will endeavour to make your stay pleasant and provide you with the necessary support.

If you require any assistance, please feel free to contact my office or anyone on the Management team.

Best wishes with your medical career. I trust this manual will be of use to you.

Dr DS Erasmus  
Chief Executive Officer: Tygerberg Hospital

## VISION, MISSION AND VALUES

The Western Cape Department of Health's vision statement is "Quality health for all".

The Department's mission is to provide equitable access to health in partnership with the relevant stakeholders within a balanced and well managed health system.

The overarching values identified by the Provincial Government of the Western Cape are:

Caring;

- Competence;
- Accountability;
- Integrity; and
- Responsiveness.

The core values that will be reflected in the way in which the vision and mission are achieved are:

Integrity;

- Public accountability;
- Innovation;
- Openness and transparency;
- Commitment to high quality service;
- Respect for people; and
- Excellence.

## SENIOR MANAGERS

### **Chief Executive Officer**

Dr DS Erasmus

### **Chief Operational Officer and Director Clinical Services**

Dr PE Ciapparelli

### **Managers: Medical Services**

Dr S Moefi

Dr AJA Müller

Dr RR Thomson

### **Manager: Medical Services and Intern Curator**

Dr K Maart

### **Director: Finance**

Mr MT Salie

### **Deputy Director: Administration**

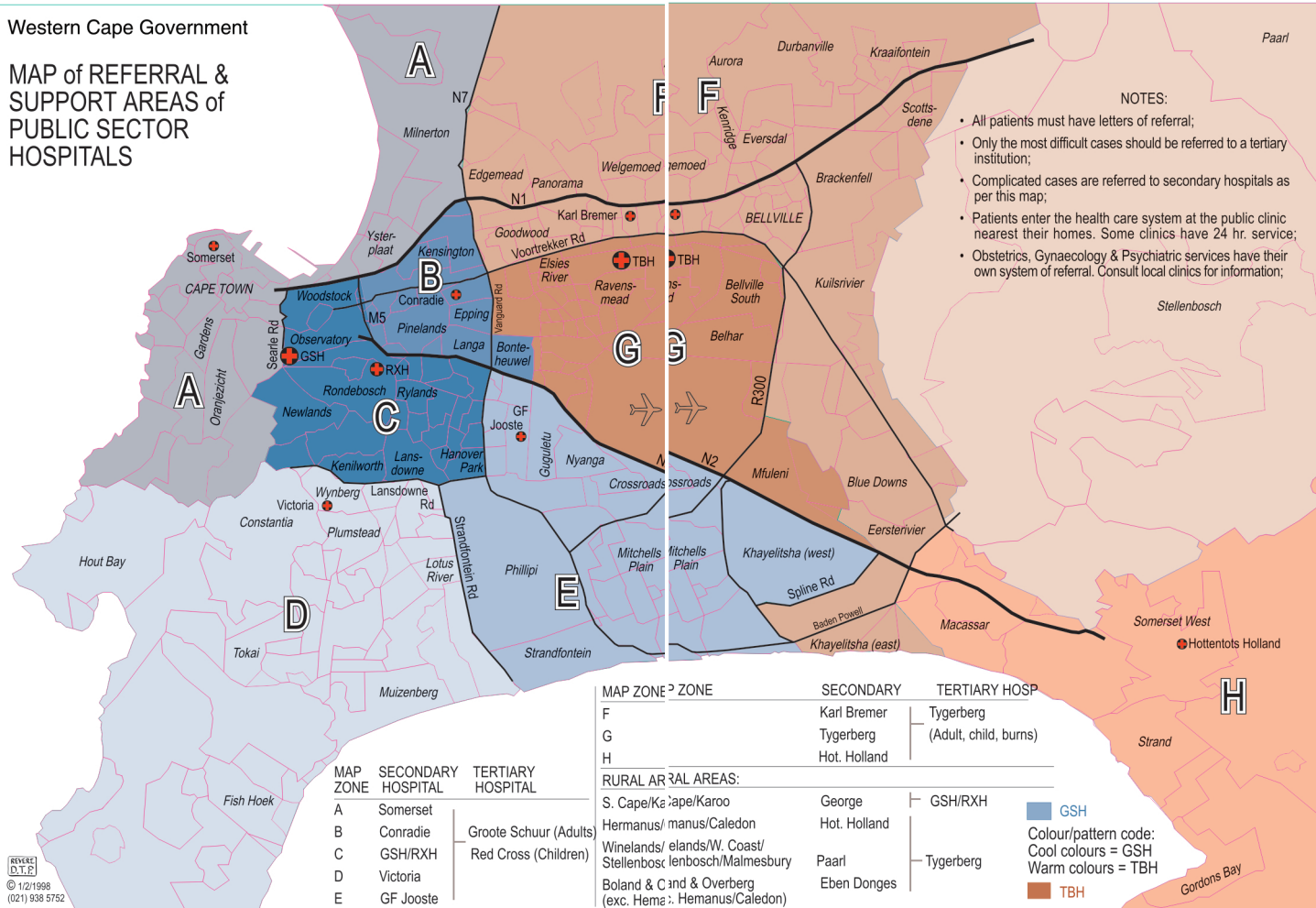
Mr PJ Wolfaardt

### **Director: Nursing Services**

Ms RM Basson

Western Cape Government

MAP of REFERRAL & SUPPORT AREAS of PUBLIC SECTOR HOSPITALS



- NOTES:
- All patients must have letters of referral;
  - Only the most difficult cases should be referred to a tertiary institution;
  - Complicated cases are referred to secondary hospitals as per this map;
  - Patients enter the health care system at the public clinic nearest their homes. Some clinics have 24 hr. service;
  - Obstetrics, Gynaecology & Psychiatric services have their own system of referral. Consult local clinics for information;

MAP ZONE	2 <sup>ND</sup> ZONE	SECONDARY	TERTIARY HOSP
F		Karl Bremer	Tygerberg (Adult, child, burns)
G		Tygerberg	
H		Hot. Holland	

MAP ZONE	SECONDARY HOSPITAL	TERTIARY HOSPITAL
A	Somerset	Groote Schuur (Adults) Red Cross (Children)
B	Conradie	
C	GSH/RXH	
D	Victoria	
E	GF Jooste	

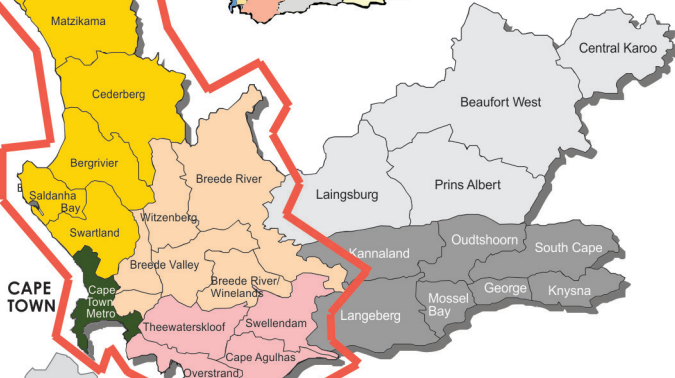
■ GSH  
 Colour/pattern code:  
 Cool colours = GSH  
 Warm colours = TBH

**Referral regions of Tygerberg Hospital**

**South Africa**  
(Nine Provinces)

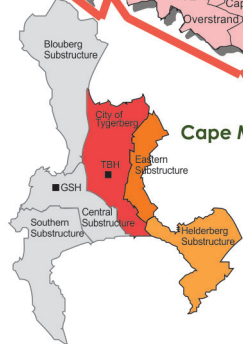


**CAPE TOWN**

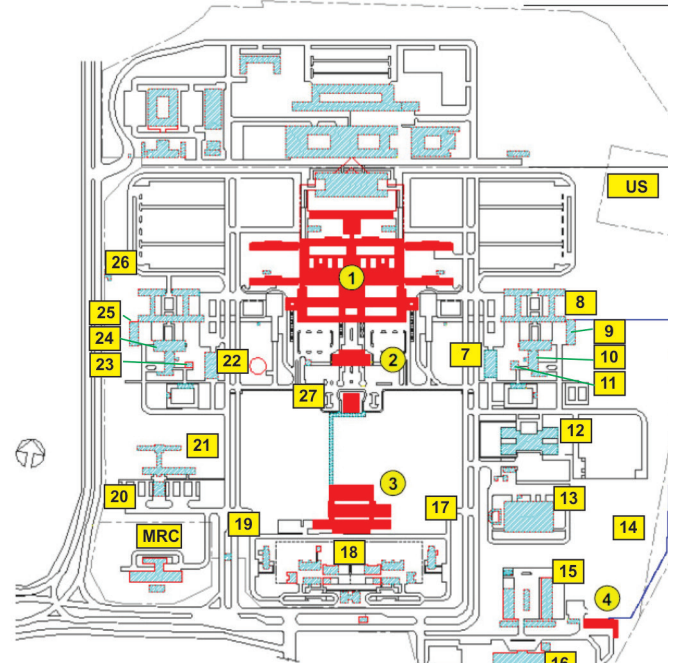


**Western Cape Province**  
(health districts)

**Cape Metro**

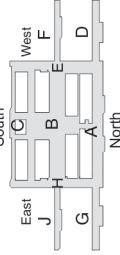


Oct 2009 R



**Buildings (highlighted in red) included in this study:**

- |    |  |    |   |
|----|--|----|---|
| 1  | Main Hospital Building   | 19 | Carl du Toit Centre - Accommodation                                     |
| 2  | Mortuary   | 20 | Tyger Bear: Social Services (seminar)                                   |
| 3  | Oncology Block   | 21 | Doctors Accommodation (flats)   |
| 4  | Boiler House   | 22 | Disa Hall   |
| 5  | Pump House   | 23 | Social services (Child and Mother sup)                                  |
| 6  | Main Electrical Substation   | 24 | Nursing College Building West, EMS Management (EMS training facilities) |
| 7  | Protea Hall  | 25 | Garages   |
| 8  | Protea Court (Residence) Block 1-3 TBH, Block 4 EMS & CPUT, Block 3, 1st floor Oncology Res. |    |   |
| 9  | Garages  |    |   |
| 10 | Nursing College Building East, CPUT Classrooms and offices & Government Transport offices    |    |   |
| 11 | Choc House: Social Services (Child and Mother support)                                       |    |   |
| 12 | U2 building: EMS & Forensic Pathology  |    |   |
| 13 | Bulk Store (Pharma)  |    |   |
| 14 | Forensic Mortuary (building not included in plan)  |    |   |
| 15 | Engineering Workshops  |    |   |
| 16 | Laundry  |    |   |



## Colour Key

**Surgical**

**Gynae/Obstets**

**Paediatric**

**Medical**

**Oncology**

**Psychiatric wards**

**Private beds**

**Day Surgery**

Non-clinical/support areas

(TOTAL 1384 beds)

### C South Passage (Outpatients)

11	HR Skills Training	Airconditioning workshop
10	Nuclear Medicine	
9	NHLS	
8	Dermatology OPD, Occupational Health, Staff clinic	
7	Ophthalmology OPD	
6	Urology OPD	
5	ENT OPD	
4	X-rays	
3	Paediatrics OPD	
2	Gynaecology OPD	
1	Trauma	
G	Parking, Workshops, Transit Lounge	
LG	Cleaning services, Workshops	

### C North Passage (Outpatients)

11	H.R.	H.I.S. Rollout
10	NHLS	
9	NHLS	
8	Medical OPD (Cardiology)	
7	Medical OPD (special clinics)	
6	Orthopaedic OPD	
5	Surgical Special Investigations	
4	X-Rays	
3	Obstetrics/Colposcopy/Infertility	
2	Labour Wards C2E (12), C2AM (19) + HC (4)	
1	Trauma CIDE (23), Resus (4 + 2 trolleys) (29)	
G	Medical Records, Dispensary, L.I.	
LG	Technical Workshops, Vaccilite store, Tel Exchange	

X Block (Gene Louw)

H2X	Oncology	26
H1X	Oncology	21

\* Ward changes in 2013:

Psychiatry Adolescent Unit will open in GLG  
Source Isolation will be opened in D10 & G10  
The Emergency Centre will open near West ambulance deck

### J (wards)

8	KIDRU	
7	Trauma Surgery	31
6	Orthopaedics	29
5	Obstetrics Post Natal	23
4	Gynaecology	33
3	Paediatrics	25
2	Obstetrics Post Natal	27
1	Surgery 18, Medical 10	28
G	Vacant/decant ward	
LG	Psychiatric OPD (Adult)	

### B/C (theatres)

8	Cardiology (C8DT)	
7	Gastroenterology	
6	Urology (C6A1)	
5	Burn wounds & Absc. (C5BT), Day Surgery 15 (C5BE)	
4	Angiography & special investigations	
3	Theatres (Gynae S/T), Eyes (Y/Z), Orthopaed (WIZ)	
2	Theatres (Obstetrics)	
1	Theatres A-J (Neuro, Plast. Gen. Emerg, Thorax etc.)	
G	Occupational Therapy, CSSD	
LG	Kitchen	

### F (wards)

4	Orthopaedics	32
3	Isolation (4)	
2	Obstetrics	34
1	Medical Emergency	28
G	Gynaecology	24
LG	Psychiatry OPD (Child)	

### G (wards)

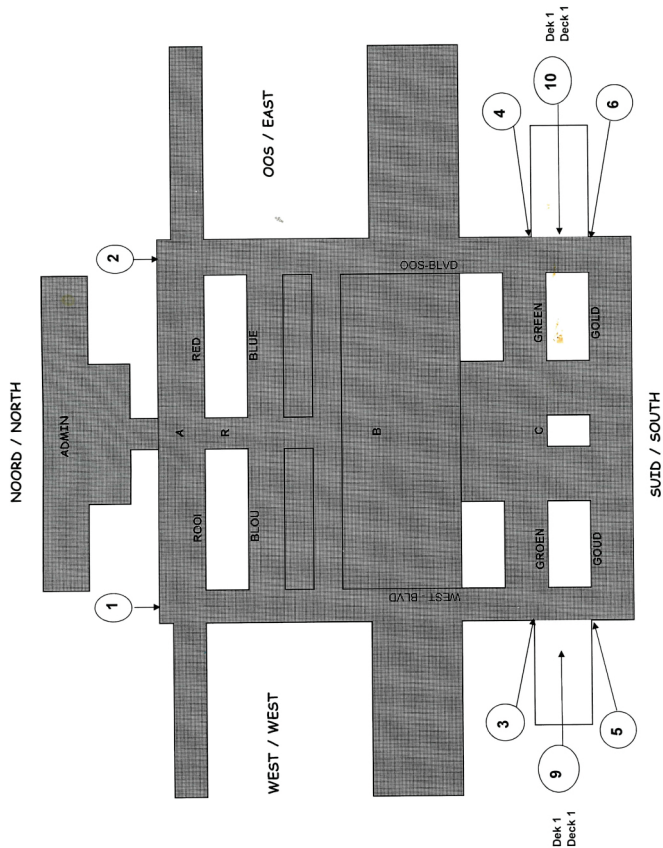
10	Paediatrics (Source Isolation)	30
9	Paediatrics	30
8	Neonatal HC	30
7	Paed. Infectious Disease	23
6	Paediatric Orthopaedics (L/M)	35
5	ENT	19
4	Paediatric Surgery	25
3	Paediatric Oncology	18
2	Paediatrics (neonatology)	38
1	Paediatrics (neonatology)	36
G	Paediatric Emergency	20
LG	Psychiatry - Adolescent Unit*	16

### A (ICUs)

10	Metabolic	14	Metabolic	
9	Vacant	26	Paediatric ICU	
8	Internal Medicine	28	Derm(12), Neuro(15)	
7	Nephrology HC + ICU	9	Nephrology	
6	Cardiology HC	16	Cardiology ICU	
5	Vacant/Decant	20	MedHC 13, RespICU 7	
4	Neuro HC 18, ICU 12	30	Neurosurg+Thorax (9)	
3	Orthopaedics	31	Orthopaedics	
2	Thoracic ICU + HC	10	Thoracic Surgery	
1	Burns	22	14 Surgery ICU (2 HC)	
G	Offices (Nursing)		Offices (Nursing)	
LG	Psychology		Offices (Services)	

### D (wards)

10	Internal Medicine (Source Iso.)	30
9	Internal Medicine	29
8	Internal Medicine (+ Haem)	28
7	Ophthalmology	31
6	Urology	32
5	Head/neck/brst(17) Abd.(14)	31
4	Private ward (23) Cardiac.(5)	28
3	Plastics/Maxillo Facial	22
2	Abdominal surgery	31
1	Vasc. surg	22
G	Psychiatry (higher functioning)	14
LG	Psychiatry (lower functioning)	12



## BACKGROUND INFORMATION

With only three medical schools in South Africa in 1956, concern existed that capacity for adequately training medical staff was insufficient. Proposals were made to establish a fourth medical school which, it was felt, would be best supported at Stellenbosch University.

Initially, Karl Bremer Hospital, on the border of Bellville and Parow, was used as the new school's tertiary hospital for practical aspects of training. This small hospital was, however, hopelessly inadequate and, in 1963, work began on the new Tygerberg Hospital and associated dental hospital. The structure included faculty buildings, two nursing colleges, nurses' and doctors' residences, workshops, laundries, crèches, research facilities for animals, and parking for cars, all covering an area of 100 hectares. The hospital was officially opened in 1976.

### Structural features

The main hospital building was designed with a floor area of some 224 843 m<sup>2</sup>. This building is 300m long from east to west and 135m wide from north to south. It is 12 storeys high, with ±40km of passages. The main building contains 53 lifts, each with a 30-passenger capacity. The main stores, the main kitchen and the central supply department (CSSD) are located at lower levels in a centrally situated block and are accessible from a vehicular off-loading and distribution centre.

### Statistics

In 2012, 408 368 inpatient days with 67 573 admissions and 494 830 outpatients visited Tygerberg Hospital, i.e. an average of 41 235 outpatients and 34 030 inpatient days per month and average of 5 631 admissions a month. The main kitchen prepares in excess of 4 200 meals per day.

### Facilities

Tygerberg Hospital has been providing highly specialised health services locally and abroad for nearly 40 years and continues to strive for and contribute to healthcare in the Western Cape and South Africa as a whole.

### Inpatient facilities

At present, 1 384 beds are in use, as per the Comprehensive Service Plan and adjustments made since the opening of Khayelitsha Hospital.

Facilities and resources are provided for numerous specialised services, which are important to lower levels of care, together with research and post-graduate



training. Units have been carefully designed for these purposes. The total number of beds includes carefully situated special ward units for medical and surgical intensive care, organ transplantation, respiratory care, renal dialysis and metabolic studies.

The main operating facilities comprise 28 operation theatres, including 6 special investigation theatres, as well as 6 recovery areas. These facilities occupy a portion of a centrally positioned block within the main hospital building.

The Gene Louw Building was officially opened in 1986 and is linked to the hospital by an underground tunnel. It houses the Oncology Department and is involved in highly specialised treatment and care for oncology patients. There is provision in this building for 47 inpatients.

The provincial paedo-audiological centre, named the Carel du Toit Centre, for hearing-impaired children, functions in conjunction with the Ear, Nose and Throat Department. It is located on the premises of the hospital and compares favourably with the best in the world.

The Tygerberg Radiation Casualty Facility (TRCF) is a dedicated unit for the treatment of all radiation casualties in the Western Cape and surrounding provinces. (Koeberg Nuclear Power Station is situated 45km from the hospital.) The facility is fully equipped with an operating theatre, ward accommodation, an isolated sewerage system and radiation monitoring equipment. Tygerberg Hospital is the only hospital in the Western Cape that is equipped to handle nuclear accident casualties.

#### **Emergency facilities**

The Diana, Princess of Wales Trauma Unit has access routes that are independent of the patient entrances. Apart from its reception, examination and resuscitation areas, this unit has 28 observation beds, dedicated theatres and a 6-bed acute intensive care unit.

Also independently accessible is the maternity section, with 15 first-stage sections, 8 delivery rooms and 2 main operating theatres.

A heliport near the western ambulance deck provides access to emergency cases arriving by helicopter. This heliport has recently been updated and relocated south of the previous area.

#### **Outpatient facilities**

It was accepted at the outset that each department should have its own outpatient section situated on the same floor as the inpatient wards of that department. This is especially suited to consultation and training.

#### **Operating theatres**

The main outpatient theatre block consists of 14 theatre suites. There are specialised theatres for emergency surgery, endoscopy and imaging and minor procedures. The outpatient block also houses the Diagnostic Radiology Service for both inpatients and outpatients, as well as the National Health Laboratory Service (NHLS).

#### **UNIQUE SERVICES AT TYGERBERG HOSPITAL**

Carel du Toit Centre for the Hearing-impaired  
Centre for Mental Health  
Clinical Nutrition and Vitaminology Service  
Clinical Retinal Laboratory  
Cochlear Implant Unit  
Complex Craniofacial Surgery Unit  
Complex Radiation and Oncological Therapy  
Metabolic Unit  
In-vitro Fertilisation  
Kidney Transplant Unit  
Human Genetics Unit  
Neonatal Intensive Care Unit  
Neuro-Psychiatry Unit  
Open Heart Surgery Unit  
Perinatal Mortality Unit  
Poison Information Centre  
Post-natal Stress Disorder Unit  
Specialised Pulmonary Function Laboratory  
Tuberculosis Clinical Work Unit  
TygerBear Social Work Unit  
Day Surgery Unit (02/2000)  
MRI  
Oncology  
Adult Burns Unit (the only one in the Western Cape)  
Hyperbaric Oxygen Facility  
PET Scanner

#### **2020 STRATEGIC HEALTH PLAN**

The Western Cape Department of Health is developing a new strategic plan for execution by 2020. It is based on the foundation laid by the 1995 Health Plan and the 2010 Comprehensive Service Plan.

The new plan has been necessitated by changes in demography, the burden of disease, advances in technology as well as the need to provide high quality, cost effective interventions within the limited resources available.

There is a quadruple burden of disease in the Western Cape that needs to be addressed. The four can be categorised as HIV/AIDS & tuberculosis; injuries; non-communicable diseases such as cardiovascular disease, mental illness etc. and women's & childhood illness. A whole of society approach will also be necessary to adequately address these problems.

Seven guiding principles have been identified as a guide to the 2020 strategy:

Patient-centred quality of care

A move towards an outcomes-based approach

The retention of a Primary Health Care philosophy

Strengthening the District Health Services model

Equity

Affordability

Building strategic partnerships

Levels of care are based on the highest level of the medical practitioner who would be required to deliver the care:

Level 1: General practitioners/family physician/Medical Officer

Level 2: General specialist, e.g. physician, surgeon, paediatrician

Level 3: Subspecialist e.g. cardiologist, neurologist, haematologist

## LABORATORY COST CONTROL MEASURES

Laboratory costs are among the biggest expenditure items at TBH. **Hospital Notice 52/2009** provides detailed information on restrictions to save costs without compromising patient care. The control measures can be summarised as follows:

Adequate labelling of specimens and forms:

Patient name, folder number, location, doctor's name, tests required.

Motivation by consultant:

Certain tests must be approved on the lab request form by a consultant, who must sign and print his/her PERSAL number in the block at bottom left.

The tests to be motivated by a consultant include:

Urea ordered from OPD (except Renal Division). In-patients – use Creatinine instead.

FBC requested after initial screen. Order only relevant components, e.g Hb & WCC. Do Ward Hb wherever possible instead of ordering from NHLS.

CRP – do not repeat more than every 24 hours for neonates. Older children and adults consultant signature needed unless ordered from ICU.

Thyroid tests – T4 tests will only be accepted if sent from Endocrine OPD or endocrinologist, Gynae endocrinology, Nuclear Medicine or Oncology. All other thyroid screen requests will result in TSH only being done.

Liver Function tests – screen request will result in only Total/Conjugated Bilirubin, ALT, ALK Phos being done unless motivated by a consultant. LFTs not to be repeated more than twice weekly unless specific motivations provided.

Cardiac markers – Troponin T limited to patients with acute coronary syndrome.

HDA1C – Not to be repeated more frequently than 6 monthly.

Lipogram – to be done not less than 6 months after stroke or cardiac infarct and not repeated more often than 6 monthly.

Mg, Ca, P – limited to severe malnutrition, renal failure, hyperparathyroidism, malignancy investigations.

### Other restrictions:

ARV, PMTCT testing – identify clearly if for ARV or PMTCT programmes (they are funded separately).

Urine MC&S – use “dipstix” or ward microscopy rather than send to NHLS.

**Requests that do not comply WILL BE REJECTED** found by the Gatekeeper. Contact her on **pager 0729** if required. She can also check if a test has been done recently at another hospital (thus avoiding unnecessary repeats).

## PERSONNEL MATTERS

### INTERNS' REGISTRATION

As in the case of all Medical Personnel, Medical interns must be registered with the Health Professions Council of South Africa (HPCSA). Proof of your registration must be submitted to the Professional Personnel Office. Should you fail to register as an Intern at HPCSA, your intern training will not be recognised.

*Please note:* Registration as an Intern is arranged in October/November in your SI year and the onus is on you to register accordingly. Without said documentation, your appointment can not be processed neither will you be allowed to perform any clinical duties.

### CERTIFICATES AND FORMS

The following certificates (which will be certified by Human Resource Officials), must be completed and submitted to the Personnel Office on assumption of duty:

- registration with the HPCSA as an Intern
- degree certificate

#### **The Personnel Office will provide you with the following:**

- personal information form
- commuted overtime contract and duty roster (obtainable at the respective departments)
- bank form for payment of your salary
- Tax number (Registration at SARS)

***Please note:*** Delegation of Powers - In terms of Section 34(2) (**MEDICINES AND RELATED SUBSTANCES CONTROL ACT 101 OF 1965**), the Director-General may in writing authorize any officer of the Department of Health to exercise or perform in general or in a particular case or in cases of a particular nature, any power, duty or function, conferred or imposed on the Director-General by or in terms of this Act

### NAME TAGS

A name tag must be obtained as soon as possible as all healthcare workers need to be clearly identified when on duty. A form to this regard will be completed by Human Resource Officials who will direct you to the Photocopy Room, A-Lower level, to obtain said.

### RUBBER STAMPS

All Interns will be provided with a rubber stamp, reflecting their name and PERSAL number on it. This stamp should be used every time a doctor signs a prescription and orders blood products or blood tests. Failure to use this stamp

may result in a request being declined.

***Please note:*** Rubber stamps will be made available to you by the hospital but it remains your responsibility to safeguard it. Replacement of a lost stamp will be at your own expense.

### RADIO PAGER/BLEEPERS

You will be assigned a radio pager/bleeper and you must accept responsibility for the device. Mr Van Renen (ext. 5295), Chief Telkom operator, will explain the procedure on collection of the device. Please ensure that your radio pager/bleeper is fully charged at all times.

### VACATION LEAVE

The annual leave accrual of 22 days is allocated to employees on the 1st of January of each year at the commencement of the new annual leave cycle. When appointed after the 1st of January, the PERSAL system will programmatically calculate a pro-rata annual leave entitlement for the remaining full calendar months of the cycle (1.83 days per month). Leave must be arranged with your immediate supervisor **exclusively in a four-month rotation** of 11 days each (not in the two-week Anaesthetics or Orthopaedic rotations). An official application form (Z1) (obtainable from the Personnel Office and/or within the departments) must be completed and submitted in advance to the relevant department. Please note that leave can be denied due to operational requirements.

***Please note:*** If you take leave without the consent of the Head of Department, it could be changed to leave without pay (your commuted overtime will also be reduced for said period), disciplinary procedures can be imposed upon you, and/or your training term can be extended.

### SICK LEAVE

36 working days in terms of a sick leave cycle spans over a period of 3 years. You must immediately (within 2 hours) notify your Head of Department/supervisor should you not be able to report for duty after commencement of the applicable workday. You may apply for sick leave for a maximum of **2 days without a medical certificate**. Heads of Departments may at their discretion require the submission of a medical certificate in respect of any sick leave period (two days or less as well) should a pattern of **sick leave abuse be detected**. Medical certificates must be submitted as soon as you return to work.

### NORMAL SICK LEAVE: 8-WEEK RULE

Please take note that in terms of the policy on the 8-week rule as contained in Circular H68/2005, **a medical certificate is required on the third absence within an 8 week period, regardless of whether a medical certificate has been**

produced on the first, second, or both occasions.

### **COMMUTED OVERTIME**

Commuted overtime will not be reduced during periods of family responsibility or sick leave in cases where officials are able to fulfil their commuted overtime contractual obligation (by swopping after hour duties with other medical staff within the specific month) or if they are not rostered to perform after hour duties on such dates.

### **ACCOMMODATION**

Accommodation is available in the doctors' quarters and can be arranged with Mr E Steyn, Room 14, Administration Building.

## **PROTOCOLS**

### **Sharp Injury Control**

*A complete protocol is available in every ward.*

1. Wash the lesion thoroughly with soap and water.
2. Immediately notify the ward sister and your registrar/consultant of the injury.
3. Have blood drawn from the contact, if known (full 10ml clotted), and take it with you. The patient's doctor is responsible for the drawing of the blood with informed consent.
4. Complete the "Sharps Injury Notification" form and take it and the blood with you.
5. Nursing and housekeeping staff must be in possession of a TH 100 referral form.
6. Report immediately to the Occupational Health Clinic at C8A West (weekdays 07:00–16:00) or F1 (after hours). Prophylaxis must be started within 1 to 2 hours (max. 24 hours).
7. You will receive counselling and your and your contact's blood will be sent for HIV and Hepatitis B testing, and a decision on the necessity of retroviral prophylaxis (according to risk and contact HIV result) will be made.
8. An IOD 1st Medical Report must be filled in by the doctor who sees you. This form must be delivered to the IOD office in H6, Room 131, in Outpatients within 24 hours.
9. Sign the prophylaxis consent form if prophylaxis is necessary.
10. Report to Occupational Health for follow-up on the first working day after the injury.

Please contact Occupational Health (ext. 6173) or the Adult Paediatric Infectious Diseases consultant through the hospital exchange with regard to any problems.

### **Hepatitis B immunisation**

Hepatitis B immunisation is available at Personnel Health for staff who work in high-risk areas. Heads of Department must motivate applications for immunisation. Immunoglobulin treatment is available to staff who have been exposed to Hepatitis B infection due to contact with infected blood or body fluid. Such persons may report to Personnel Health or the Personnel Clinic (8th floor west, ext. 6181).

## HINTS FOR SUCCESSFUL PRACTICE

### Speed service

All doctors who leave the hospital premises must inform the telephone exchange as well as the radio room where they can be found and the names of their replacements. Services may not be swapped without the consent of the responsible Head of Department or his or her nominee. Each department has its own accommodation arrangements.

### Emergencies

An emergency requires immediate attention, whether it is your patient or not. See all patients allocated to you, regardless of medical fund, injury on duty, etc. You should not argue with patients about such matters. Patients should not be turned away from admission areas. However, patients who arrive by ambulance may be turned away.

### Malpractice

You should never refuse to see a patient. Arrange with a colleague to see the patient if you are unable to do so. You are advised to take out cover for professional liability in case of malpractice.

### Intravenous administering of liquids or blood by a nursing practitioner

If a nursing practitioner is requested to administer liquids or blood intravenously, it is implied that the doctor has ascertained the ability of the nursing practitioner to do so and that the doctor bears full responsibility for any consequences.

### Equipment

Moving equipment from one division/ward to another is not permitted. Treat all equipment with respect and care.

### Clinical Executive Officer on duty after hours

The operator at the telephone exchange (021 938 4911/or dial 9 internally) will contact the Medical Superintendent on duty.

### Patient information

Patient information is confidential and may only be discussed in the multi-professional team set-up. You are not permitted to speak to the press. You may contact the Public Relations Office at ext. 5454 or the Clinical Executive Officer on call.

### Media liaison

You may under no circumstances address the media. If you are contacted by

or wish to convey something to the media, please contact the Public Relations Office in the administration building, Room 9, ext 5454/5608.

### Theatre clothing

Management is aware of the increasing tendency of doctors and medical students to wear theatre attire outside the theatre complex and even outside the hospital. This behaviour is in breach of infection control measures of the hospital. All personnel leaving the theatre complex must put on their normal clothing even if they merely visit a ward. Supervisors must please ensure that this instruction is adhered to.

### Special instructions

Upon being appointed, all interns must become familiar with the special instructions and procedures laid down by the departments to which they belong.

### File summary in wards (Clinical Assistants)

Complete your summaries within 14 days after the patient has been discharged. If you do not, and the file is sent to the Medical Reports Office without the summary, you will have to do the summary there.

### File covers

Do not remove file covers from wards or clinics. The medical records section is willing to draw files for research purposes. Contact your Clinical Executive Officer concerning outpatients.

### Black ink pens

Use only a black ink pen as writing in coloured ink is not visible on microfilm.

### Medical Reports Office

The purpose of this office is to provide information on medical records on request to the South African Police Services (SAPS), patients, attorneys and the Road Accident Fund. It is crucial that full notes on the patient's condition and treatment are recorded. Dates and times are very important. Completing the forms provided by the Medical Reports Office, and making statements to SAPS when necessary are also part of doctors' duties.

### Non-smoking policy

In accordance with the non-smoking policy of the Provincial Government of the Western Cape (PGWC), a designated smoking area within the building may be established solely at the discretion of the Head of Department.

**Language of preference:**

English to be the language of preference in recordkeeping and ward rounds.

### Nursing Services

#### PROTOCOL: OBTAINING PERMISSION FOR MEDICAL INTERVENTIONS

1. A medical practitioner is responsible for obtaining informed permission from the patient.
2. The practitioner must ensure that the patient understands the extent and possible consequences of the intervention.
3. No nursing practitioner or student may obtain permission on behalf of a medical practitioner.
4. The nursing practitioner may only act as a witness and must be present when the medical practitioner has been obtained.
5. Permission must be obtained as soon as possible, after admission of the patient, from the relevant medical practitioner.
6. Permission and accepting possible risks must be confirmed voluntarily by the patient.
7. The person who grants permission must have the legal capacity to do so.
8. The responsibility of ensuring that lawful permission for an intervention does exist, rests with the person undertaking the intervention.
9. Although it is a medical practitioner's duty to obtain permission, it is the nursing practitioner's duty:
  - to bring it to his/her attention that permission should be obtained timeously
  - to avail himself/herself of that fact that the patient has been properly informed i.r.o. the procedure to be conducted
  - to act as a witness in the presence of the medical practitioner
  - on the day of the intervention, to check that the permission has been completed, before the premedication is administered
  - if permission has not been obtained timeously and any deviations

or cancellations occur, immediately to inform the relevant medical practitioner and ward staff, the patient, the anaesthiologist and theatre staff

- if any doubt exists i.r.o. the validity of the permission form, to discuss it with the relevant medical practitioner, and if any problems are experienced, to contact the Medical Superintendent.
10. Validity of permission forms:
    - Permission forms must be valid, particularly after six months or after administration of anaesthetic.
    - For cases requiring more than one anaesthetic, e.g. burn wounds or plastic surgery, permission has to be obtained for each operation.
    - Informed permission has to be obtained for each operation, in other words one permission form does not cover multiple operations when the procedure requires anaesthesia.
  11. Persons who are permitted to give permission, are referred to notice 38/2002 and 71/2002.



## GENERAL INFORMATION

### **Air-conditioning**

All windows need to remain closed to ensure an effective air-conditioning system.

### **Fines**

A fine will be imposed for parking in any other area, or on yellow lines, or across more than one parking space, or in such a way as to obstruct traffic flow or the parking of other vehicles or to prevent the removal thereof, or in violation of any rules issued by the Clinical Executive Officer. Copies of the parking rules are available from Enquiry Office West.

Doctors who are living in have parking at the doctors' quarters and are kindly requested to keep their cars parked there.

### **Telephones/kiosks**

There are public phones situated throughout the hospital, at the entrance to wards as well as at all main entrances. Telephones cards are sold at the various kiosks at the main entrances. Most kiosks are open until 15:30.

The number for the Tygerberg Hospital switchboard is 021-938 4911; alternatively, you may dial 9 internally.

### **Postal and banking facilities**

These facilities are situated south of the hospital.

**Please note:** Official envelopes may not be used for personal mail even if you use a stamp.

### **Cafeteria**

The cafeteria is situated at the lower level of the administration block and may be reached through the linking corridors that lead to the university.

## ANNEXURE A

### HOUSE RULES

To ensure that your stay at Tygerberg Hospital is memorable and pleasant, it is important that you observe the following rules. They apply to all premises leased on the grounds of Tygerberg Hospital. *It is suggested that you read them before you sign the lease agreement.*

#### 1. ON ARRIVAL

- a. Report to the office of the Housekeeper.
- b. Acknowledge receipt of your room / flat key.
- c. Ensure that equipment in the leased premises is in working order and that all items on the inventory list are checked before you acknowledge receipt thereof.

#### 2. PERSONAL BELONGINGS

- a. Insuring personal belongings is your own responsibility.
- b. It is strongly recommended that personal items be clearly marked.

#### 3. ELECTRICAL MATTERS

- a. Use of the following electrical items is permitted subject to approval of each item:
  - kettles
  - hair dryers
  - asbestos or fan heaters
  - television sets and radios
  - microwave ovens
  - two-plate stoves
  - small refrigerators
  - toasters
- b. Only three-point plugs are allowed and no more than three (3) power sources may be used simultaneously.
- c. The following items are not allowed on the leased premises
  - washing machines
  - tumble dryers
  - open flame heaters
  - electric frying pans
  - satellite dishes
  - internet links

#### 4. OCCUPATION OF THE LEASED PREMISES

- a. The leased premises must be used for accommodation only

- b. Subletting of the property is prohibited.
- c. The premises must be kept neat and tidy at all times.
- d. The PGWC cannot accept responsibility for theft of property or other losses.
- e. Tenants should ensure that their rooms/flats are locked whenever they are not physically occupying the same.
- f. Tenants are responsible for the cleaning of their rooms/flats. Refuse bins must be emptied in the garbage containers provided.
- g. Only press-stick may be used to fix photographs and pictures to walls.
- h. Under no circumstances may Western Cape government furniture be damaged or removed from the leased premises.
- i. To prevent wind damage, it is suggested that window latches and locks be closed when tenants leave their rooms/flats. Negligence may result in your being held accountable for damages.
- j. No alteration of any kind may be made to the property.
- k. The Western Cape Government/Management of Tygerberg Hospital or any representative they appoint may inspect the leased premises at any reasonable time.
- l. Any substance abuse or other unacceptable behaviour will result in disciplinary action and a request to the tenant to vacate the leased premises.
- m. No item or product/substance that can cause damage or endanger the safety of other tenants, personnel or the public may be kept or stored in the leased premises.
- n. This lease agreement entitles the tenant to occupy only the room/flat specified. Under no circumstances may the rooms or flats of other tenants be occupied or visited without their express permission.
- o. For inventory control and health and safety reasons, the leased premises will be inspected once a month.
- p. **No alcohol** may be brought into or consumed in the residence.
- q. **No pets** are allowed on Tygerberg Hospital premises.

#### 5. LINEN / WASHING

- a. Tenants are to provide their own linen, bedding, towels and curtains.
- b. Washing facilities are available.
- c. No hospital linen may be used.

#### 6. BATHROOMS AND TOILETS

- a. Bathrooms and toilets are cleaned daily by contracted staff.
- b. Tenants must ensure that these areas are left in a clean and neat condition after they have been used.



**7. USE OF TELEPHONES AND THE RECEIVING AND MAKING OF CALLS**

Public telephones are located within the residence. Tenants should always be mindful of the fact that long telephone conversations infringe the right of others to use these facilities.

**8. VISITORS (GUESTS)**

- a. Visitors are allowed on the leased premises only if accompanied by the tenant.
- b. Visitors will not be allowed to overnight.

**9. PARKING**

- a. Tenants and visitors must park in designated parking areas only.
- b. Tenants may apply for undercover parking, which is subject to a monthly fee. Details can be obtained from the Housekeeper.

**10. SWIMMING POOL**

The rules regarding the use of this facility can be obtained from the Housekeeper.

**11. ON DEPARTURE**

- a. An inventory of all the equipment and items on the leased premises is required on departure. All losses/breakages must be reported to the Housekeeper who will take the necessary action.
- b. Tenants must leave their forwarding addresses and telephone numbers with the Housekeeper to enable further communication if necessary, and to ensure that mail can be directed to them after their departure.
- c. On departure please hand the keys back to the housekeeper

**UNDER NO CIRCUMSTANCES MAY THESE RULES BE REMOVED FROM THE LEASED PREMISES.**

**LEASE AGREEMENT**

Entered into by and between

The Provincial Government of the Western Cape – Tygerberg Hospital  
**(hereafter referred to as the LANDLORD)** at Private Bag X3, Tygerberg, 7505  
**(address)**

**AND**

-----

(Full name and surname of Tenant (hereafter referred to as the TENANT))

-----

(Identity Number or Passport number (if the latter includes an expiry date))

Description of leased "PREMISES" at Tygerberg Hospital: -----

**(Please complete alternate contact details)**

Physical address: -----

Postal address: -----

Telephone No.: -----  
(Cell, home, work, etc)

E-mail address: -----

-----

**TERMS AND CONDITIONS**

**1. DURATION**

1.1 This lease shall commence on \_\_\_\_\_ (day) \_\_\_\_\_ (month) \_\_\_\_\_ (year) and shall lapse on the \_\_\_\_\_ (day) \_\_\_\_\_ (month) \_\_\_\_\_ (year). This agreement therefore terminates on the \_\_\_\_\_ (day) \_\_\_\_\_ (month) \_\_\_\_\_ (year), unless an earlier date is agreed to.

## 2. RENTAL

- 2.1 The rental for the PREMISES shall be R \_\_\_\_\_ (subject to periodic adjustments) per month.
- 2.2 The rental will be recovered from the TENANT'S salary/paid to the Accounts Section at the Hospital Administration on or before the first day of every week/month (delete what is not appropriate) should the TENANT be employed by Tygerberg Hospital. Direct advance payments MUST be made in advance by those TENANTS NOT employed by Tygerberg Hospital
- 2.3 The TENANT shall pay to the LANDLORD a deposit to the amount of R \_\_\_\_\_ upon the signing of this lease agreement and receipt of the keys to the leased PREMISES. Under no circumstances shall the TENANT be allowed to offset the last months' rental against the deposit paid.
- 2.4 The LANDLORD shall be entitled to increase the rental at any time on receipt of notification of a rental increase as approved by the Head: Health.

## 3. USE OF PREMISES

The unit shall only be occupied by the TENANT. The LANDLORD reserves the right to have TENANTS share a unit.

The TENANT shall have the right of reasonable use, having regard to the rights of all other lessees and/or other occupiers of the LANDLORD, of the common areas, toilets and other conveniences and facilities provided by the LANDLORD. The TENANT shall use the PREMISES only for residential purposes.

The TENANT shall not be entitled to sub-let the PREMISES or cede any of its right hereunder.

The TENANT shall not be entitled to alter or add to the PREMISES any installations therein contained without prior written consent of the LANDLORD.

The TENANT shall not affix objects to the PREMISES by means of nails, screws or otherwise without the written consent of the LANDLORD. The TENANT shall not be entitled to change the locks to any doors to the PREMISES or in respect of the furnishings/equipment therein.

## 4. SERVICES

### 4.1 Inclusive Rental

The rental includes the TENANT'S right to use of the furnishings/equipment and services hereinafter provided for, save to the extent that this agreement expressly provides for the payment of additional charges therefore.

### 4.2 Furnishings/Equipment

- 4.2.1 The TENANT shall be entitled to use the furnishings/equipment situated on the PREMISES and detailed on "Annexure A" hereto, for the duration of this agreement.
- 4.2.2 Ownership of the furnishings/equipment used by the TENANT in terms of 4.2.1 shall at all times remain vested in the LANDLORD.
- 4.2.3 The TENANT shall use the said furnishings/equipment with such care as to ensure that it remains at all times in good order and repair, fair wear and tear only expected, and shall at the termination hereof return such furnishings/equipment to the LANDLORD in like good order and condition, fair wear and tear only expected.

### 4.3 Telephone

- 4.3.1 If the PREMISES are supplied with a telephone extension, the TENANT will be required to pay the full rental and usage fee as charged by Telkom. The TENANT also acknowledges that this service can be removed at any time.
- 4.3.2 All outgoing calls made by the TENANT on the PREMISES shall be charged by the LANDLORD to the TENANT.
- 4.3.3 The TENANT shall not be entitled to install or otherwise use direct telephone or other communication systems from the PREMISES other than via a cell phone.
- 4.3.4 If the TENANT fails to pay any amount due to the LANDLORD in respect of telephone charges, rental or any other amount in terms hereof, the LANDLORD shall be entitled to refuse the TENANT the use of the telephone services herein provided for.

**5. LIMITATION OF LIABILITY**

The TENANT shall:

5.1.1 have no claim of any nature whatsoever against the LANDLORD for any loss, damage or injury which it may directly or indirectly suffer (except where caused through the gross negligence of the LANDLORD) by reason of any latent or patent defect in the PREMISES or any damage or destruction to the PREMISES, furnishing and/or equipment; theft from the PREMISES; and, defect or disrepair of the PREMISES and/or the furnishings/equipment.

5.1.2 not be entitled to withhold or defer payment of any amounts due in terms hereof.

5.1.3 under no circumstances have any claims against the LANDLORD for consequential loss, however caused

**6. Breach**

6.1 If the TENANT fails to make a payment of any amount due in terms hereof or commits any other breach of this agreement and does not remedy the latter mentioned breach within 3 (THREE) days of being asked to do so, then the LANDLORD shall be entitled to terminate this agreement, eject the TENANT from the PREMISES and retake possession of the furnishings/equipment used by the TENANT in terms hereof. If the TENANT disputes the LANDLORD'S right to terminate this agreement and remains in occupation then the LANDLORD shall be entitled to continue to receive payment of the rental and other amounts due in terms hereof without prejudice to its contention that this agreement has been terminated.

6.2 The TENANT shall pay interest on all amounts overdue in terms of the lease at overdraft rate as determined by the Head: Health. The interest shall be calculated from the due date of such amount to the actual date of payment thereof.

**7. WHOLE AGREEMENT**

This agreement constitutes the whole agreement between the parties and no variation hereto shall be of any force or effect unless reduced to writing and signing by the LANDLORD and the TENANT. No consensual termination of this agreement shall be of any force of effect unless reduced to writing and signed by the LANDLORD and the TENANT.

**8. NON-WAIVER**

No relaxation or indulgence which any of the parties may afford to the other/s shall in any way prejudice or be deemed to be a waiver of the rights of the indulgent party and shall not preclude or stop the indulgent party from exercising all or any of its rights hereunder and, in particular but without limiting or derogatory from the a foregoing, any cancellation hereof or accrued right of cancellation hereof.

**9. JURISDICTION**

The TENANT consents to the jurisdiction of the Magistrate's Court or otherwise competent jurisdiction in respect of any action or proceeding which may be brought against it by the LANDLORD; provided that the LANDLORD shall be entitles to bring proceeding which would, but for the foregoing, fall outside the jurisdiction of the Magistrate's Court.

**It will be the responsibility of the TENANT to adhere to the House Rules contained in "Annexure A" attached to this lease agreement. A breach of any of the conditions outlined in either of these documents (i.e. this lease agreement or the House Rules) WILL RENDER THIS AGREEMENT NULL AND VOID. The TENANT also acknowledges that the House Rules may be amended by the LANDLORD when considered necessary.**

THUS DONE AND SIGNED AT \_\_\_\_\_(PLACE)

THIS DAY OF \_\_\_\_\_ (DAY) \_\_\_\_\_ (MONTH) \_\_\_\_\_ (YEAR)

FULL NAME & SIGNATURE OF TENANT:

\_\_\_\_\_

WITNESSES (NAME & SIGNATURE):

1. \_\_\_\_\_

2. \_\_\_\_\_

## ANNEXURE B PARKING

### Security

Although a level of security is provided on site, Tygerberg Hospital accepts no responsibility for damage to, or loss, or theft from vehicles when driven or parked on site, or for theft of a vehicle.

### PARKING AT OWN RISK

#### General

Staff and official visitors must park only in the clearly defined and marked parking spaces. Failure to do so will result in warnings or fines being issued.

All members of staff wishing to park within the hospital grounds are required to apply for a parking permit in advance of using any of the designated parking areas. Applications will only be accepted once a hospital notice / internal circular is issued advising staff to apply. Parking permits entitle staff to use an available space but do not guarantee that one will be available.

Staff must park in the spaces that are provided regardless of convenience or distance from working location. Cars that are parked in area other than clearly defined parking spaces will be subject to parking enforcement measures.

#### Warning stickers / fines

Staff are liable to receive a warning sticker if they:

- park in a non-designated area, including patient parking areas or on yellow/red lines, grass verges, loading/restricted bays, or such a way as to block fire exits, etc.
- fail to display a valid permit/disc for the car park/area they are parked within
- take up more than one clearly defined parking space.

Warning stickers are issued by site security. They remain active from the date of the offence for a period of 12 months. Any person who receives 3 warnings and or fines within a 12 month period will have his/her parking privileges revoked.

#### Blue badge holders (disabled persons)

To ensure that all roadways are accessible at all times, the hospital does not allow any vehicle to be parked on yellow/red lines or other non designated areas. Specific parking spaces are provided for disabled persons as close as possible to the entrances to the hospital. Able-bodied persons are not to use these parking bays.

Staff who has a disability that directly affects their mobility will be issued on

application with a blue parking disc. However, they must apply for such disc and pay the prescribed monthly fee. Where necessary, the Occupational Therapy Division will be called upon to make an assessment of individual needs before a permit is issued.

#### Issue of permits

Application forms for parking discs are available from the Security Office on Ground floor, E-Passage during office hours.

Parking permits / discs are issued every two years. Information and publicity regarding reissue days will be forwarded per internal circular in advance. Special reissue sessions will be held for night staff to ensure that all employees have an opportunity to collect their permits.

Please note:

- Any permits that cannot be collected during the reissue sessions must be collected from the Security Office on Ground Floor, E-Passage during office hours.
- New permits will not be issued unless old permits are returned.
- Permits must be collected personally. Staff members are required to present their hospital ID cards when collecting their permits.
- Collection of the parking disc / permit signifies acceptance of the full terms of this parking policy.

#### Responsibility of permit holder

Once the permit is issued, it is the responsibility of the permit holder to ensure the following:

- a valid permit is displayed
- all details recorded on the permit are correct and, in particular, vehicle registration numbers are correct at all times
- the permit is clearly displayed on the windscreen of the vehicle
- the full permit is not obscured and is clearly visible at all times

Failure to display a valid permit in the above manner, regardless of reason, will be subject to parking violation measures.

#### Change of vehicle

Should a member of staff change his / her vehicle or the registration number of the vehicle, a change of vehicle form must be completed and returned to the Security Office. A replacement permit will be issued confirming the new details. The old parking permit must be returned in exchange for the replacement permit.

### **Photocopies or forged permits**

Photocopied or forged parking permits are strictly prohibited. The use of fraudulent permits is seen in a serious light. Disciplinary action may be taken against staff members who are found to have photocopied or forged a permit.

### **Lost permit**

It is the responsibility of the permit holder to ensure that the permit is kept safe. Should a permit be lost, an administration fee may be charged (dependent on circumstances) for the issue of a replacement permit.

### **Permit allocation**

Parking permits are issued to staff who are eligible to park in the designated staff areas of the car parks. Allocation of permits is monitored to ensure parking spaces are effectively utilised.

Staff who live on site are also expected to apply for a parking permit and will be charged the monthly fee.

Long term contract staff are expected to apply (and pay) for a parking permit. The number of permits issued is limited.

### **Yellow permits**

As of August 2010, the charge for issuing a parking permit is R6.00 per month. The charge will, however, be reviewed on a regular basis.

### **Current permit holders**

All current permit holders are required to apply for a new permit by 31 December 2014.

## **CLINICAL DEPARTMENTS**

### **Department of Anaesthesiology and Critical Care**

**Head: Prof AR Coetzee**

Intern should note the following with regard to routine examination of patients to be prepared for operative treatment.

#### **Patient's history**

The record of the patient's history must include:

- Previous illnesses
- Family conditions (e.g. porphyria, muscle conditions, malignanthyperthermia)
- Previous operations and anaesthesia, with details of complications  
All recent treatment including (but not limited to) steroids, antihypertensive substances, lonidine, B-adrenergic blockers, cardiotonics, psycholeptics particularly MAO inhibitors and tricyclic substances, anticogulation therapy, barbiturate, opiate, diuretics, meformin ,phenformin and aspirin or other platelet inhibitors.
- Social habits: smoking, alcohol, drugs
- Exercise capacity.

#### **General examinations**

- Body length and mass must be routinely measured upon admission.
- Respiratory and circulatory problems are the most common causes for cancellation of patients and need special attention.
- Haemoglobin below 10g/dl is unacceptable for routine surgical patients and should be above 12g/dl before major interventions.
- Airway deviations, acute infections, or a history of upper airway infection in the previous 6 weeks influence the anaesthetic technique. This is of special importance in children.
- Mouth sepsis is a contra-indication for chest and upper abdominal surgery.
- Patients with previous injuries may not be able to assume normal operating positions.
- Hand and forearm veins are routinely used for anaesthetics and blood specimens should therefore be drawn from the cubital fossa. Haemoglobin, urine analysis and a blood glucose test must be done as part of *clinical examination*.

#### **Special examinations**

Examination of blood urea, creatinine, albumin and glucose are routine in

patients older than 60 years.

ECG is performed routinely on all patients older than 45 years.

- For all other special examinations there must be a valid clinical indication. If you are unsure, contact the anesthetist on the list or the Department of Anaesthesiology and Critical Care for advice. The ordering of special examinations are the responsibility of the intern responsible for the patient.

### **Special anaesthetic techniques**

#### **Children**

Children should not be deprived of food for long periods and should, where possible, be booked first on a surgical list (for a predetermined time). Loading with appropriate liquids are compulsory (see the standard instruction for preoperative fasting as issued by Management).

#### **Diabetics**

Patients taking oral medication or insulin could become hypoglycemic if deprived of food before an operation. Cover any food deprivation period with intravenous glucose and consult Anaesthesiology concerning treatment.

#### **Blood pressure control**

Deliberate control of blood pressure may be essential for ear-nose-and-throat, plastic, and neurosurgery. ECG, blood-gas and electrolyte readings and a haemoglobin of at least 12g/dl are required regardless of the patient's age.

Indications of brain damage, ischemic heart disease, kidney disorders areas contra-indications for this technique.

#### **Anaemic patients**

Packed erythrocytes are administered 24 hours before the operation to increase the haemoglobin to above 10g/dl. When the operation is not urgent, intravenous iron and appropriate vitamins may well be suitable and less expensive.

#### **Problem patients**

If there is an expectation that the general condition of the patient or the extent and nature of the surgery may create special problems, the consultant of the day, Anaesthesiology and Critical Care, R2 (ext. 5142), should be notified in writing on a referral form at least **48 hours** before the planned operation. Anaesthesiology staff members will examine the patient and suggest special examinations or treatments.

Avoid unnecessary cancellation before an operation by discussing problem patients well beforehand with your Anaesthesiology colleagues.

### **General rules for operations**

#### **Operation lists**

- Bookings on operation lists must reach the R2 theatre offices by 13:00 the previous day. Late bookings and changes to lists are not accepted, unless directly arranged with the anaesthetist concerned or the medical superintendent responsible for theatres. Bookings for Monday must be handed in on Friday.
- Longer procedures must be placed at the beginning and shorter procedures at the end of the list.
- All the details on the booking list must be provided. This includes the estimated time for procedures.
- The clinical examination and all results of special examinations must be available at 13:00 in the patient file in the ward on the day before the operation. If the necessary particulars are not available it may be impossible to accept the patient for anaesthesia.

#### **Blood transfusion**

Find out expected blood loss from the doctor and discuss the number of units needed or group and place on reserve. Packed erythrocytes are used when less than 4 units will be administered. If problems are encountered with the booking of blood, the anaesthetist should be warned before the induction of anaesthetics.

#### **Cancellation**

Cancellation of bookings is inevitable when:

- the patient has not been properly examined
- a problem patient has not been referred to Anaesthesiology and Critical Care in time
- a problem patient has not been correctly prepared for the particular type of operation
- too many patients have been booked for a particular operation session (it is unfair to patients and the anaesthetic staff to overbook lists. A certain amount of overbooking is accepted due to logistical problems in the hospital, but these must be kept to a minimum).

#### **Interns working in Anaesthesiology Critical Care**

According to the rules of the Health Professions Council of South Africa, all practitioners must rotate in Anaesthesiology for 2 months. The purpose

of compulsory anaesthetic rotation is to attain skills in basic anaesthesia techniques, gain practical experience in anaesthesia and to recognise patients at risk.

Interns report to theatre at 07:30, attend pre-medications, and perform emergency service. Your active and disciplined participation, as certified by the supervisory doctor, is necessary for the Head of Department to sign the Health Professions Council's documents.

Any administering of anaesthetics by an intern must take place under the direct supervision of a member of the department or a suitably qualified registered practitioner.

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## **Department of Family Medicine, Primary Care and Mental Health** **Head of Department: Prof B Mash**

This rotation is organised by Family Medicine and Primary Care

**Head of Division:** Prof Bob Mash  
F313, 3rd Floor, Fisan Building, Medical School  
Telephone: 021-938 9170  
E-mail: rm@sun.ac.za

**Intern Curator:** Prof Julia Blitz  
3rd Floor, Fisan Building, Medical School  
Telephone: 021 938 9925  
Fax: 021-938 9704  
E-mail: juliablitz@sun.ac.za

**Administration of intern rotation:** Ms Nicole Cordon-Thomas  
3rd floor, Fisan Building, Medical School  
Telephone: 021 938 9061  
Fax: 021 938 9704  
Email: nicolec@sun.ac.za

The rotation uses a number of community and hospital-based teaching sites. The contact details for these sites are listed below:

### **Community Health Centres**

Khayelitsha Community Health Centre  
Facility manager: Ms Notshe 021-361 3470 (w); 076 368 3906(c)  
Email: funotshe@pgwc.gov.za  
Family Physician: Dr S Govender: 083-680 8716  
Email: govender@sun.ac.za

Elsies River Community Health Centre  
Facility Manager: Ms R Kasker 021 931 6023  
Email: rkasker@pgwc.gov.za  
Family Physician: Dr M Bello 072 488 9471/021 931 7822  
Email: mbello@pgwc.gov.za

Nolungile Community Health Centre  
Facility Manager: Sr Mcikela 021 387 1200  
Family Physician: Dr J Kumari 0725886298

Email: kumarij1010@gmail.com

Delft Community Health Centre  
Family Physician: Dr Tasleem Ras 0823821919  
E-mail: Tasleem.Ras@westerncape.gov.za  
Facility manager: Mr Horne 021 954 2235 / 7

### **District Hospitals**

Eerste River District Hospital  
Superintendent: Dr Adele Anthony 021 902 8000  
Email: adele.anthony@westerncape.gov.za

PA: Veronica Wilson 021 902 8024  
Email: vwilson@westerncape.gov.za

Khayelitsha District Hospital  
Superintendent: Dr Kharwa 021 360 4427 / 4500  
Email: Anwar.Kharwa@westerncape.gov.za  
Dr Liezel Rossouw 0837756758  
Email: liezelross@yahoo.co.uk

### **Psychiatry**

Executive head: Prof. S Seedat  
2nd floor, Medical School  
Telephone: 021 938 9227

Stikland Hospital  
Old Paarl Road, Bellville  
Dr Aneshree Moodley  
Email: moodleyanesh@sun.ac.za

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## **Department of Forensic Medicine**

### **Head: Prof SA Wadee**

Consultants: Dr JJ Dempers, Dr EH Burger, Dr S Afonso

For any medico-legal queries, feel free to consult this division.  
Call: 021 938 9325/ 021 938 9516 or 71 9325/71 9516

### **Death notification form (DHA-1663)**

This is only completed by clinicians in cases of natural death and stillbirth. In unnatural deaths, the forensic pathologist who performed the autopsy will complete the form. Complete the death notification form as soon as possible after death and definitely before you leave the hospital. Use only capital letters and a black pen. Please avoid abbreviations, and make sure that the underlying cause of death is recorded in the lowest completed line in Part 1 the "Medical cause of death "section. Do not indicate mechanisms of death, like hypoxia, anemia or shock as underlying conditions.  
Seal the last page of the form in an envelope, and staple to the other pages.

### **Please note:**

- Sections A and D may be completed by the ward staff, and section B and G must be completed by the clinician. However, the doctor is ultimately responsible for the information completed on the whole form. Section G1 is intended for patients more than one week old, and section G2 for stillbirths and children under 7 days old.
- If a diagnostic autopsy is requested from Anatomical Pathology, only sections A, B and D are completed, with the necessary request forms (see "Anatomical Pathology" in the Specimen Sampling Manual at the back of this booklet). All of these forms must accompany the body to the mortuary.
- In the case of a stillbirth, the DHA-1663 may be completed by a registered nurse.
- If a person dies from unnatural causes, the form for referral to Forensic Pathology (FPS100) must be completed, and must accompany the body to the Forensic Pathology Services Laboratory. Since the autopsy cannot be performed until the forms are completed, it is of the utmost importance that the treating clinician completes the form as soon as possible to avoid distress to the family. This form must be completed by a senior clinician that was involved in the treatment of the patient. The DHA-1663 will be completed by a member of Forensic Pathology after the autopsy is completed.

### **Procedure-related deaths**

According to Section 48 of the Health Professions Act, (Act 56 of 1974), "the



death of a person undergoing, or as a result of, a procedure of a therapeutic, diagnostic or palliative nature, or of which any aspect of such a procedure has been a contributory cause, shall not be deemed to be a death from natural causes".

If a death can in any way be related to a procedure, it is prudent to discuss the case with the forensic pathologist on call. When referring the case, Form GW7/24 must be completed as soon as possible by the surgeon, anaesthetist and nurse involved, and must be sent with the body and folder to the Forensic Pathology Service.

#### 'Dead on arrival'

Confirm that the patient is dead and complete the Dead on Arrival form. Please attend to these patients immediately because ambulances must always be made available for other service duties and should not be held up unnecessarily.

**Please note:** The Dead on Arrival form is not the same as the Death Notification form (DHA-1663). Before the DHA-1663 can be completed, the circumstances surrounding the death must be ascertained from ambulance personnel and family members of the deceased. If the patient has been treated at Tygerberg Hospital before, and the clinical appearance, history and hospital notes are in accordance with the circumstances of the death, the DHA-1663 may be completed. The information used in this process should be recorded briefly in the hospital folder.

#### Classification of unnatural deaths

These cases should be referred to Forensic Pathology Service!

*Deaths due to the application of an external force and the complications thereof:*

- Any physical, chemical or thermal injury
- injury caused by nature e.g. dog bite, bee sting anaphylaxis
- complications of injury e.g. tetanus or rabies after dog bite; gas gangrene or necrotising fasciitis after gunshot wound, stab wound
- pneumonia or pulmonary embolism after traumatic injury

*Procedure-related deaths:*

A procedure-related death is the death of a person undergoing, or as a result of, a procedure of a therapeutic, diagnostic or palliative nature, or of which any aspect of such a procedure has been a contributory cause. *This definition is not limited to the 24-hour period after the procedure* and may include less radical surgical procedures such as tooth extractions, cardiac catheterisation or bronchoscopy.

*Sudden, unexpected deaths*

- sudden death in adults without any obvious cause
- so-called cot deaths (Sudden Infant Death Syndrome).

*Acts of omission or commission*

- any death, including deaths that would otherwise be classified as "natural", where it is suspected that the death was due to negligent care by medical staff or any other person.

#### Good note keeping practice

Medical and allied health staff members are reminded of their responsibility and duty to make "clear, objective, contemporaneous, tamper-proof and original" notes of all aspects of their medical practice.

The HPCSA recommends<sup>1</sup> that all notes be annotated with a signature, name in print, as well as the HPCSA number of the health care practitioner. In hospital practice, the Medical Protection Society also recommends your pager or phone number.<sup>2</sup>

#### Cause of Death Certification

The **Immediate Cause** is the final disease, injury or complication directly causing the death. It should be noted that the mechanism of death or terminal event (for example, cardiac arrest or respiratory arrest) is not considered to be a cause of death. The mechanism of death should not be reported as the immediate cause of death as it is a statement not specifically related to the disease process, and it merely attests to the fact of death.

The **Underlying Cause of Death** is the disease or injury that started the sequence of events leading directly to death or the circumstances of the accident or violence that produced the fatal injury. In the case of a violent death, the form of external violence or accident is antecedent to the injury entered, although the two events may be almost simultaneous.

#### Instructions for completion of the cause-of-death section on Death Notification Form DHA-1663

The cause-of-death section consists of two parts. **Part I** is for reporting a chain of events leading directly to death, with the **immediate cause** of death (the final disease, injury or complication directly causing death) on line (a) and the

1 HPCSA, Guidelines on the Keeping of Patient Records (2008),

2 Medical Records in South Africa: An MPS Guide

**underlying cause** of death (the disease, injury that initiated the chain of events that led directly and inevitably to death) on the lowest used line. If only one line is used, only line (a) should be completed. **Part II** is for reporting all other significant diseases, conditions, or injuries that contributed to death but which did not result in the underlying cause of death given in

**The cause-of-death information should be the medical practitioner's best medical OPINION.** Report on each disease, abnormality, injury, or poisoning that the medical practitioner believes adversely affected the decedent. In the case of injury or poisoning the case should be referred to Forensic Pathology Services. A condition can be listed as "probable" if it has not been definitely diagnosed. If an organ system failure such as congestive heart failure, hepatic failure, renal failure or respiratory failure is listed as a cause of death, it must always be followed by details on its aetiology on the line(s) beneath it (for example, renal failure **due to** Type I diabetes mellitus).

**Example:**

G MEDICAL CERTIFICATE OF CAUSE OF DEATH		Approximate interval between onset and Death (Days / Months / Years)	FOR OFFICE USE ONLY	
PART 1 Enter the disease, injuries or complications that caused the death. Do not enter the mode of dying, such as cardiac or respiratory arrest, shock or heart failure. List only one cause on each line.			ICD-10	
IMMEDIATE CAUSE (Final disease or condition resulting in death)	(a) <u>Acute renal failure</u>	<u>5 days</u>	<input type="checkbox"/>	<input type="checkbox"/>
	Due to (or a consequence of)		<input type="checkbox"/>	<input type="checkbox"/>
Sequentially list conditions, if any, leading to immediate cause.	(b) <u>Hyperosmolar non-ketotic coma</u>	<u>8 days</u>	<input type="checkbox"/>	<input type="checkbox"/>
Enter UNDERLYING CAUSE last (Disease or injury that initiated events resulting in death)	(c) <u>Diabetes mellitus, non-insulin dependant</u>	<u>15 years</u>	<input type="checkbox"/>	<input type="checkbox"/>
	Due to (or a consequence of)		<input type="checkbox"/>	<input type="checkbox"/>
	(d) _____		<input type="checkbox"/>	<input type="checkbox"/>
	Due to (or a consequence of)		<input type="checkbox"/>	<input type="checkbox"/>
PART 2 Other significant conditions contributing to death but not resulting in the underlying cause given in Part 1			<input type="checkbox"/>	<input type="checkbox"/>
	<u>Hypertension, previous myocardial infarction</u>		<input type="checkbox"/>	<input type="checkbox"/>

*In this case, hypertension and a previous myocardial infarction would both be considered factors that contributed to the death. However, they would not be the direct causal sequence of Part I, so they would be placed in Part II. It is acceptable to list a mechanism (acute renal failure) as an immediate cause of death if it is followed by an underlying disease that could be considered the cause of death.*

**Extracted from:**

**Pieterse D, Groenewald P, Burger L, Kirk G, Bradshaw D. Cause of Death Certification: A Guide for completing the Death Notification Form (DNF) – BI-1663. Cape Town: South African Medical Research Council, 2009.**

**Department of Gynaecology and Obstetrics**

**Academic Head: Prof G Theron,** (phone extension: 4661)  
 General Specialist Head: Dr GS Gebhardt (x4638)  
 Intern Coordinator: Dr Leneque Lindeneque and Dr L Vollmer  
 Dr J Butt (duty rosters, leave) x4749

Dear colleague; welcome to our department.

Documentation regarding your responsibilities will be supplied by Ms Terblanche (x4432) when you join the department. The duty rosters, information and protocols will be supplied electronically before you join the department. Please send your contact details (cell phone and email address) to Dr J Butt (jbutt@sun.ac.za) **at least one month before** you start with your rotation. Your group's Intern representative must liaise with dr Butt regarding all roster-related issues- any problems must be sorted out amongst the group first.

Working (office) hours are from 07:30–16:00 and all clinics and ward rounds start strictly at 07:30. Information on the after-hours duties and academic ward rounds that must be attended will be supplied when you start.

Leave requests must be sorted out before you start your rotation. The available slots and leave rules are available from Mrs P Arnold (x4432) and are filled on a first-come basis. You can already book your slots in the beginning of the year.

- Please note that attendance at the following weekly meetings is compulsory:
- Mondays, 15:00. Departmental Morbidity and Mortality meeting in ward F3
  - Thursdays 13:00. Perinatal Morbidity and Mortality meeting in ward F3
  - Every second Tuesday of the month at 07:15. Monthly meeting with the intern coordinator.

Attendance of the postgraduate meeting on Fridays at 14:15 in the Genetics Seminar Room, 2nd floor, Medical School is voluntary.

A folder with all departmental protocols is accessible on <https://docs.google.com/open?id=0B4oAbUbQcDhxTWJfZVZma2xOdUK>

## Department of Medicine

### Executive Head: Prof MR Moosa

Departmental Secretary: Mrs L. Horn (A5 west, ext. 4944, Room 37)

Welcome to the Department of Medicine. The department's intern supervisors is Dr C Bouwens (bleeper 0840 / Cell phone 083 310 1106) and the Head of General Medicine is Dr Nesdaad Schrueder (ext 5732 / phone 084 582 4552) You are welcome to discuss any problems with them. Additional information about the department is provided in the registrar guide, which is available from the departmental secretary.

During your rotation in Medicine, you may be allocated to work in one of the firms, A5 (High Care) and/or be assigned to do the Emergency Unit (F1)/Relief slot. Although the work is demanding it is very rewarding and if you participate actively you will derive great benefit from your experience. A formal evaluation will be done at the end of your rotation - this could be invaluable should you apply for a medical officer/registrar post in the Medicine department.

### Patient care

Your duties in respect to general patient care include the following:

1. Patient care: Evaluation and admission of patients to F1, general wards and the high care ward (A5 west) as well as daily follow-up of these patients. We advise you to discuss any problems with the supervising medical officer/F1 registrar or the medical firm in question. Your duties will include comprehensive note taking including assisting with the discharge summaries. From time to time you may have to assume greater responsibility in the ward should your registrar not be available.
2. Student supervision: Students will work under your supervision and you will have to ensure that the overall standard of patient evaluation, patient care and the ward work of the students are satisfactory. Furthermore, you are expected to assist with supervision of students' documentation and to make an input into the allocation of marks at the end of students' rotation in your firm.
3. On call duties: Each medical firm is on call one weekday per week and on average 5 weekends per 3 month block. On your weekday call, the shift will be divided between the 2 sides of the firm. You will be expected to work in F1 when your side of the firm is on call. The side of the firm that is not in F1 during the evening shift provides cold cover for the general

wards and the intern is expected to sleep in. There is a room in D8 for this purpose. Additional telephonic cover will be provided by the registrar. Therefore, emergency numbers (home/cell) should be provided to the sister in charge of the ward. A weekend call entails 24-hour duty in F1, which may be on a Friday, Saturday or Sunday, as per call roster. Only one side of the firm is on call on weekend days, so you will also be required to cover the wards.

4. Procedures: You will be afforded the opportunity to learn various procedures. These include venesections, placing intravenous lines including central venous catheters, passing nasogastric tubes, lumbar punctures, lymph node aspirations, draining ascitic/pleural fluid and inserting intercostal drains. Procedures are to be performed under supervision except where competence has been adequately demonstrated to your supervisor.
5. Weekly statistics: Weekly statistics on each medical firm are handed in every Thursday to the departmental secretary. Statistics must be handed in before 12:00. Statistics forms are available at the secretary's office.
6. F1 team duties: Managing all the patients in F1 (you will be joined by the F1 consultant at 09h00, but start seeing pts at 08h00) with the following emphasis:
  - I. Ensuring that the plan proposed by the medical firm is followed (prescribed/ordered medication given, confirming that planned special investigations have actually been booked etc.).
  - II. Follow-up of special investigations and ensuring that appropriate treatment is started based on test
  - III. Discharge/transfer of patients who do not require admission. Please note that many patients who are discharged from F1 do not require follow-up specifically at Tygerberg hospital MOPD. All bookings for MOPD should therefore be discussed with the F1 registrar/consultant to avoid unnecessary MOPD bookings.
  - IV. Liaise with the nursing staff in F1 to facilitate the allocation of beds and transfer of patients from F1 to other wards.
  - V. If you are unsure of the plan or it differs from the firm's plan, the F1 consultant will discuss it with the Firm Consultant.
  - VI. Help the "on-call" registrar with assessing patients, ordering investigations and supervising students with procedures..
  - VII. Assist with the triage unit ("siftings") where all unreferred patients are evaluated. If you are unsure if the patient requires admission, please discuss with the F1 registrar / consultant.

You will notice that many of these functions overlap with that of the firms, but they may be post-call and already have gone home.

**MAKE SURE IF YOU ADMIT/TRANSFER A PATIENT FOR A FIRM, THAT YOU HAND OVER THE PATIENT TO THE FIRM'S INTERN – THIS IS CRITICAL TO AVOID A SITUATION WHERE PATIENTS END UP IN A WARD WITHOUT BEING SEEN BY A CLINICIAN.**

#### Chronic Care Patients:

These patients add to the pressure on acute beds and the quick turn-around time in the medical wards because patients have nowhere to go.

It is important to realize that families also have to take responsibility for their relatives. Liaise with the family early to discuss a long-term plan. Expecting the social worker to sort out placement without input from the medical team often cause delays in discharging patients.

Currently available facilities are Conradie Care, Booth Memorial and Western Cape Rehabilitation. The different facilities offer different services and have unique limitations. For example, some have physiotherapy services, others don't etc. Keep in mind that these facilities do not have medical doctors on-site and therefore only stable patient not receiving intravenous medications can be referred. Our social workers will assist you with deciding which facility is most appropriate and early referral to Social Services is recommended. Each medical ward has a specific social worker assigned to it. If you cannot get hold of your ward's social worker, you may contact Ms Dhansay @ extension 4164/5873 or e-mail her at Dhansay@gwgc.gov.za.

To assist the social workers in their job:

- I. Identify appropriate patients early – preferably on admission already.
- II. Get the social worker involved early – day 1 if appropriate.
- III. Make sure treatment which will delay placement, (IV antibiotics, physiotherapy etc.) is initiated early so that it does not complicate discharge.
- IV. Make sure discharge medication is ordered in time. Patients usually need a month's medication when they are transferred.

#### **Discharge planning:**

There is always extreme pressure to open beds of discharged patients as soon as possible. One way of achieving this, is discharge planning. Here are a few tips:

- I. Finalize the prescription the day before discharge. In the majority of patients you will already know what medications to discharge the patient on a day or two before the patient goes home. Even if the pharmacy is closed after 14H00, you can still do the prescription so that the sisters can send it off at 07H00 and don't have to wait until 11h00 when you have finished with your ward round. By 11h00 the pharmacy is also busy with MOPD prescriptions, so they are slower with discharges.
- II. Try not to reinvent the wheel. Do not re-write chronic medication if it has not changed. It will be less work for the pharmacy, will save money and if the patient does not have to wait for meds, he will be out of here quicker.
- III. Write the discharge note the previous afternoon. Then if nothing has changed, you can hand it to the sister at 09H00 on the round, instead of only writing it at 11H00 when your round is done.
- IV. Pre-empt social problems. If it is a 70 year old lady who use to stay alone and now had a stroke, refer her to the social worker on Day 1, so that we can start working on a plan in advance.
- V. Talk to the families. Linked to the above, keep clear communication with the families, so they can plan in advance to care for terminal patients. Get a phone number on admission and write it on the cover of the folder, 2 days later you always struggle to get hold of them.

#### Discharge/Transit lounge:

Located at J-Ground next to the general reception area. Equipped with comfortable recliners and a television for patients. Both male and female toilet close by (5 meters). Staffed by a home based carer (HBC).

Purpose: for patients to wait on their medication and families after discharge, so that the beds can be cleared and new patients admitted. This is very important since F1 casualty is always full.

Patients must be medically stable, mobile and able to care for themselves. Only local patients can access the facility since the transit lounge closes after-hours, and transport to peripheral areas is not reliable. If someone is from afar they need to wait in the ward for transport. But still inform the bed manager of these patients so that they can assist in arranging transport.

Once the doctor has done the discharge letter and prescription, he/she informs the Ward-sister that the patient is a suitable candidate for the discharge lounge. The sister will then contact the discharge lounge (x6583)

and arrange transfer of the patient.

### **Cost-effective medicine:**

Practising cost-effective medicine without compromising quality of care cannot be overemphasised. Always think twice before requesting tests. For example:

- I. Do not request a complete FBC to monitor the Hb.
- II. Do not request a UE&C if you just want to follow-up the s-potassium.
- III. Do not repeat tests which were recently performed at referring hospitals unless absolutely necessary.
- IV. Switch from IVI to oral antibiotic treatment whenever possible.
- V. Students should also be supervised in this regard.

### **Academic obligations:**

Interns who show initiative, participate actively in academic discussions and are present at academic meetings will greatly enhance their final assessment. As a member of an academic department, you are expected to attend the following meetings.

- I. Tuesdays 14H30: General internal medicine academic meeting in A10 Seminar Room. There will be topic discussions, journal club and M&M meetings for the division of General Internal Medicine.
- II. Wednesday, 14H00: Intern teaching takes place weekly for all interns in Internal Medicine and is led by a senior registrar in the department. Its purpose is to further improve the clinical skills of interns. Dr AJ Viljoen is responsible for drawing up the roster for the rounds. It starts at Jane Horns office in A5. If you want to discuss particular topics, feel free to contact the registrar involved to arrange it.
- III. Thursdays, 15H30. Weekly departmental academic meeting in the Medicine department.

### **Operational Meetings:**

- I. Mondays 8h00: Business meeting at the Medical School, compulsory for all members of the department. Interns are expected to report briefly at the meeting on all mortalities that occurred the previous week. (Please ensure that the designated mortality forms are completed. The use of designated M&M forms is obligatory).
- II. Fridays at 12h00: General Internal Medicine divisional meeting. All operational issues and troubleshooting will be done at this meeting. Your feedback is vital to improve the working environment and patient care within the division.

## **A5 High Care job description**

Daily patient care

1. Evaluate all new patients thoroughly. They may have been referred from a physician, but you are now going to be responsible for their care, so you need to be in control of what is wrong with them.
2. Evaluate all the patients on the day that you are on call. The person going off would have done it, but for the next 24 hours they are your responsibility, you need to get an idea of their condition.
3. Make sure all patients have nursing orders etc. diet, fluids, Hgt, nurse head-up etc. including the patients discharged to the wards.
4. Write a plan for the patient for the day e.g. wean O2, mobilize, refer.
5. Check and write down the blood results on the result sheet. Check all the preceding results of the patients on computer to see if any culture results have become available.

Ward functioning

1. The post-call morning – do round at 6 am, examine all the patients and get results ready for ward round. Do blood gasses where necessary, plus other appropriate bloods. Although we are always trying to save costs, these patients are critically ill, therefore, do not cut corners to save money, at the detriment of patient care.
2. On day of call - do the ward work (e.g. referrals, radiology etc)
3. Go see the patients on the list for High Care and prioritize them. Remember ICU gets preference.
4. Fill in the Apache scores. Worst values in the first 24 hours.

When discharging patients from A5:

1. Complete a comprehensive discharge summary.
2. Phone to check for beds in the wards: D10, D9, D8, A8E. If no beds available phone bed manager or bleep her if no answer. A5 High Care has preference over F1 when there are limited beds available in the wards, because we need to clear our beds so that we can accept new patients from F1. If you do not get help from the Bed Manager, phone your consultant for assistance.
3. Phone the registrars whose patients are discharged and let them know to which ward they will be going to. If the patient was admitted directly to ICU look when the patient arrived (ambulance sheet) and check on F1 roster who was on call that day – inform that registrar that it is his/her patient and which ward they are going to.

Additional things to make your and everybody's life easy:

1. It's a good idea to write the basics on the "clinical notes forms" for the next day in the evening. E.g. diagnosis, medication, what day their lines are etc. Also complete your blood forms. It saves time for your morning round.
2. Check the blue file to see that there's enough forms and the blood trolley for stock (blood tubes, syringes, blood culture bottles etc) for the night. Do this before nursing handover at 19:00 because the store room key gets locked away at night.
3. Do the blood gases at around 07:00 to be ready for the technologist coming on at 07:30. The technologist does rounds in A9 at 06:00 in the morning so the gasses will just lie there.
4. On the consultant round make sure which patients are for intubation.

Leave arrangements: Leave is granted according to a leave schedule, which is available from the departmental secretary. Leave arrangements should be discussed with the firm or head of the unit in question and with Dr C Bouwens or Dr Schrueder during your first month of assuming duty or as soon as possible thereafter.

Updated August 2013

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## Department of Medical Imaging and Clinical Oncology

### RADIODIAGNOSIS

**Head: Prof Richard Pitcher**

Application forms must be completed in full. If the radiologist on duty in any modality cannot be contacted for arrangement of an urgent examination, the on-call radiologist can be contacted through the Tygerberg Hospital exchange (ext. 6666).

### General enquiries

*Between 08:00 and 16:00 weekdays:*

C4B X-Ray Unit appointments: ext. 5913

Reception: ext. 5900

Assistant director Radiography: ext. 5918

Chief radiographer: ext. 5149 or radio 0012

*After 16:00 and over weekends:*

C1A X-Ray and Mobile Unit radiographers: ext. 5233 / 5378

Radiologists: ext. 5868

### Referral of patients

#### **Non-urgent plain-film radiography**

##### *Inpatients*

Send request form only. The Radiodiagnosis will send for the patient.

##### *Outpatients*

Send patient, request form and previous X-Rays to X-Ray Reception H4 East.

#### **Urgent plain-film radiography**

##### *Inpatients*

Send request form, marked URGENT.

##### *Outpatients*

Send patient, request form and previous X-Rays to X-Ray Reception H4 East.

#### **Emergency services (F1 and C1D)**

Send request form to C1A X-Rays. Radiodiagnosis will send for the patient.

**Trauma patients**

Send patient to C1A X-Rays.

**Special examinations**

Arrange non-urgent bookings telephonically at ext. 5913.

**Inpatients**

Send request form to booking office – tube H4 (after hours to E1). Radiodiagnosis will send booking date and instructions for preparation to the ward.

**Outpatients**

Send patient, request form and previous X-Rays to Radiodiagnosis Reception H4 East for booking, so that instructions for preparation can be explained to the patient.

**Please note:**

- 08:00–16:00: Contact the radiologist on duty at the specific imaging modality required.
- 16:00–24:00: Contact the radiologist on duty at ext. 5868, or through exchange at ext. 6666.
- Preparation for special examinations is available at H4 East Reception (after hours at C1A X-Rays).
- Children undergoing anaesthesia for CT or MRI examinations will require consent of parent or guardian.
- Patients undergoing arteriograms or biopsies must sign consent.

**Mobile examinations**

Arrange telephonically at ext. 5233/5378.

**Ultrasound service****Normal hours****Urgent inpatients cases**

Urgent cases: Arrange urgent cases telephonically with the radiologist/sonographer at ext. 5095

**Inpatients**

Arrange telephonically at ext. 5641. Request forms are placed in the patient file.

**Outpatients**

Arrange telephonically at ext. 5641

Patients are then sent to Ultrasound with their request form to collect preparation.

**After hours**

Contact the radiologist on duty at ext. 5868.

**Neurovascular radiology****Normal hours**

Arrange bookings telephonically at ext. 5924.

**After hours**

Contact the radiologist on duty at ext. 5868 then send request form via L4 tube.

**X-Ray examinations or screening in main theatres****Normal hours**

Examinations to be arranged the day before at ext. 5924/5279.

Confirm the time of the theatre procedures.

Check for availability of C-arm before anaesthetic is administered.

Urgent cases need prior arrangement at ext. 5924/5279.

**After hours:**

Book telephonically at ext. 5378/5233.

**Computer tomography(CT)****Normal hours**

Urgent cases to be arranged telephonically with the radiologist on duty: Ext. 4768/5931.

**Inpatients**

Send request form to C4B.

**Outpatients**

Arrange appointment telephonically at ext. 5599/5798. Put request form in patient folder and send patient.

Head CTs: Send only request form

Body CTs: Send patient, request form and X-rays from outside hospitals to CT. All body CTs have to be approved.

**After hours**

Contact radiologist on duty at ext. 5868.

**Please note:**

- Parents or guardian must give written consent for children under the age of 18.
- X-Ray examinations may be requested by doctors only.
- Accurate and complete clinical information must be provided on the request form.

**MRI requests**

MRI request forms are available at clinics and wards. It is crucial that these forms are completed in full and countersigned by the appropriate requesting consultant. All MRI have to be approved by the radiologist on duty at the MRI Department (ext. 5933/5099).The X-Ray packet of the patient should accompany the request form.

**For CT and MRI please note:**

- U+E results required for all patients > 65 and added risk factors for renal disease.
- IV line for all inpatients.
- The requesting clinician is required to obtain consent from the parent or guardian for any child under the age of 18 for anaesthesia to be administered during the imaging procedure.

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**NUCLEAR MEDICINE DIVISION**

**Head: Prof A Ellmann**

Gold Avenue, 10th Floor, Tygerberg Hospital  
PET/CT Centre: Gene Louw building (adjacent to X-block)

**Enquiries**

Bookings: ext. 4268 (general Nuclear Medicine); ext. 6552 (PET/CT)  
Results: ext. 4265, Room 41 or ext. 6552(PET/CT Centre)  
Reception (patients): ext. 4261  
Enquiries after 16:00 and over weekends: Registrar/consultant on call (information at radio room, ext. 6666)

**Completion of referral forms**

Referral forms must be completed in full because procedures and treatment may influence the interpretation of studies.

**Routine appointments**

**Non-urgent examinations**

Inpatients: Send only the request form. Nuclear Medicine will contact the ward/ referring doctor as soon as space is available.

Outpatients: Send the patient with fully completed referral form to the appointment area of Nuclear Medicine.

**Urgent examinations**

Contact the registrar on call (ext. 4268 / 4265 or after hours at the radio room on ext. 6666).

**Special examinations**

**Myocardial perfusion studies**

All patient appointments must be arranged by the referring doctor specifically with the responsible registrar on cellular number 0733 44 7218; information available at ext. 4265/4268).

The patient's full history, current medication and contact information, including a telephone number where the patient can be reached, must be available when the appointment is made.

Patient information brochures should be provided to patients. If not available in your department/ward, they can be collected from Nuclear Medicine.

**Cerebral perfusion studies**

Appointments must be made preferably by the referring doctor, specifically with the responsible registrar (information available at ext. 4265/4268). Only a limited number of studies can be performed per week. Please make the appointment in good time.

**Ventilation and perfusion lung scintigram**

A lung scintigram can be properly interpreted only if a recent chest X-Ray (<24 hours old) is available. This service is available after hours and on weekends. Please note that Tc-99m aerosol is used as ventilation agent, which is often not optimal in patients with chronic obstructive airway disease.

**Treatment of hyperthyroidism**

Treatment of patients suffering from hyperthyroidism with radioactive iodine (I-131) will be considered only after the patient has been evaluated at Nuclear



Medicine, after a thyroid scintigram has been done, and after thyroid functions are known.

Please book individual patients with the registrar responsible for the Nuclear Medicine thyroid clinic (information available at ext. 4265/4268/6206).

#### **Position emission tomography (PET/CT) studies**

PET/CT bookings must be made at the PET/CT Centre at ext. 6552, but will only be finalised after authorisation by the responsible registrar. For any PET related questions or enquiries, the registrar can be contacted on cellular number 0733 604 665. Information is also available at ext. 6552/4265).

The request form for PET/CT studies with the patient's full history, weight, current medication and contact information, including a telephone number where the patient can be reached, must be completed and sent to the PET Centre. PET/CT request forms are available from the PET/CT centre, extension 6552.

#### **General remarks**

1. Nuclear Medical examinations on children are performed with the consent of the nuclear physician, who has been given full authority by the chief executive officer of the hospital. Parents, therefore, do not need to sign consent.
  2. Nuclear Medicine examinations may be requested only by doctors.
  3. If you are unsure about patient preparation or want to find out whether there is a Nuclear Medicine examination that could help with a certain problem, please contact ext. 4265 / 4268 / 6552 (for PET/CT studies) or one of the doctors.
  4. Some examinations such as whole-body iodine studies, MIBG and, octreotide studies, labelled white cell studies and most haematological studies must be discussed with the Nuclear Medicine doctor before an appointment will be given.
  5. Please provide a full history on the relevant request form as far as possible.
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## **Department of Psychiatry**

**Executive head: Prof. S Seedat**

### **Intern managers**

*Overall intern coordinator*

Dr Aneshree Moodley 021 940 4400 / 021 940 8921

*Stikland Hospital*

Old Paarl Road, Bellville

Dr Aneshree Moodley 021 940 8921 / 021 940 4400

*Tygerberg Hospital*

Psychiatry, 2nd Floor, Faculty of Health Sciences

Dr Gerhard Jordaan 021 938 9227

*Community Psychiatry*

Dr Chris Verster 021 940 4400 / 082 772 7740

Dr Helena Lategan 021 370 1111 / 083 368 0190

An introduction to the rotation will be held, details of which will be communicated to you prior to starting the Family Medicine / Psychiatry rotation. Please email Dr. Moodley at aneshmoodley@gmail.com to enquire about the introductory session.

### **Learning outcomes**

Learning outcomes for this rotation are defined in detail by the HPCSA and can be summarised as follows:

- to manage undifferentiated condition in primary care, provide chronic care and be exposed to aspects of palliative and forensic medicine
- to manage typical conditions seen in a district hospital
- to manage common mental-health problems in primary care and community psychiatry
- to manage acute psychiatric emergencies in primary care and in hospital
- to have opportunities for collaboration with other primary healthcare workers, such as nurses and allied health professionals
- to integrate the experience, knowledge and skills gained in all other domains.

### **Length of rotation**

One month in an acute psychiatry ward and 2 sessions per week (of 4 hours per session) in a community psychiatry clinic during the four-month Family Medicine rotation.

### **Psychiatric hospital**

Interns work at one location (either Stikland Hospital or the psychiatric wards of Tygerberg Hospital) for a month under the supervision of psychiatric registrars and consultants and will participate in the following: consultations with patients in the full spectrum of psychiatric illnesses ward rounds, and after-hours work at the hospital.

### **Community Psychiatry clinic**

Interns work in one clinic for the entire four-month period and attend two sessions per week. In the first session they assess new referrals together with psychiatric nurse and, in the second session, present these patients to the psychiatric registrar. Clinic sites will be allocated at the discretion of the consultants and will cover all CHCs in the Northern and Eastern metropole, including Somerset West, Khayelitsha and Strand.

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## **Surgical Department**

Specific information is listed under the respective sections.

### **GENERAL SURGERY**

**Head: Prof BL Warren**

Interns will receive a 12-page booklet on departmental protocols at the start of their surgical rotation. Registrars and medical officers may receive protocol manuals for Trauma and ICU rotations.

#### **Interns' duties:**

Interns rotate on the surgical gastroenterology service and the so-called "cocktail" units of the surgical interest groups.

1. Admission of patients to general wards, C1DE and special units, as well as the daily care of these patients. You are requested to discuss any problems with the clinical assistant or duty group in question. You may request basic special examinations at your own discretion, but you are expected to discuss advanced examinations with the senior members of your team. You are responsible for taking the admission notes, as well as keeping the follow-up notes. Where students take these notes, you are responsible for checking that they are correct and must counter-sign the notes. You must also write an appropriate discharge summary to give to the patient on discharge, containing the relevant clinical information about the admission.
2. Student interns and other students work under supervision and you have to ensure that the standard of patient evaluation and general ward work of students are satisfactory. Your opinion may be sought when marks are allocated to students in your duty group.
3. Emergency firm services are scheduled weekly and on Saturdays and Sundays according to the duty roster. Interns are responsible for initial assessment and management of incoming patients in C1DE or the "cocktail" admission units. After-hours cover of ward patients is the responsibility of the intern on call, in conjunction with the patient's treating registrar. You may on occasion be requested to adapt to changes in the duty and training programmes of the department's service units.

#### **Academic obligations**

As a member of an academic department, you are expected to attend the following meetings, as well as other meetings scheduled as per the

service where you rotate. Your active participation in discussions is expected.

1. Mondays, 13:00. Surgical gastroenterology X-Ray meeting for staff on this rotation. Compulsory for all members of the department.
2. Wednesdays 14:00. Personnel meeting, M&M meeting, academic discussion and teaching ward round, or other activities as listed in the departmental programme.

### **Leave arrangements**

Leave is granted according to a leave schedule. You will be on leave for either the first or last two weeks of the month during a Surgical Gastroenterology rotation. Contact Dr Ilina Conradie if you need to make other arrangements, which will be granted in special circumstances only.

### **GENERAL SURGERY SERVICES**

#### **Surgical gastroenterology**

This service manages all GIT and soft tissue septic surgical pathology and is truly a general surgical service. There are five service units, which share on-call duties.

#### **Burns**

Tygerberg Hospital houses the regional Adult Burns Unit, where one intern will rotate at all times.

#### **Surgical intensive care (A1)**

A 12-bed ICU, which offers the opportunity for tertiary surgical services.

#### **Head, neck, mamma and thyroid surgery ("surgical oncology")**

Manage mainly breast and thyroid disease, but also head and neck tumours, melanoma and soft-tissue sarcoma.

#### **Paediatric surgery**

A comprehensive paediatric surgical service for neonatal patients and infants, which currently also manages paediatric trauma. Special interest in Hirschprung's disease.

#### **Trauma Service and Surgical Unit**

Trauma Service manages all initial assessment, stabilisation and resuscitation of the injured while the Surgical Unit co-ordinates complex multi-trauma patient care and manages abdominal, vascular and neck soft-tissue trauma as well as post-ICU trauma care and the management of crush syndrome.

### **Vascular Surgery and Vascular Laboratory**

A sub-specialist unit, that manages all acute non-trauma and chronic arterial disease (occlusive and aneurismal) and complex venous disease. Also manages delayed-presentation vascular trauma (over a month post-injury).

### **SURGICAL DIVISIONS**

#### **Anaesthesiology**

Head: Prof AR Coetzee

#### **Cardiothoracic Surgery**

Head: Prof GJ Rossouw

#### **Neurosurgery**

Head: Prof HB Hartzenberg

#### **Ophthalmology**

Head: Prof D Meyer

#### **Otorhinolaryngology**

Head: Prof J Look

#### **Orthopaedics**

Head: Prof GJ Vlok

#### **Plastic Reconstructive Surgery**

Head: Prof FR Graewe

#### **Urology**

Head: Prof C Heyns

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## Department of Paediatrics and Child Health

### PAEDIATRICS SECTION

Head: Prof M Kruger

The documents you will be given at the beginning of the year:

- Map of the hospital
- Information on the issue of beepers
- Information on access-control cards/discs

The documents you will receive when you assume duty in Paediatrics include:

- A page to complete listing your personal details – to be handed in to Paediatrics' secretary;
  - Information sheet for new doctors (Paediatrics), which includes guidance/ information on:
    - Primary staff members and their contact details
    - Ward allocations & assessments
    - On-call duties & rosters
    - Handover ward rounds
    - Sleeping arrangements on calls
    - Functioning within the wards
    - Needlestick injuries
    - Departmental meetings
  - Rules regarding leave
  - Hand-outs on managing common conditions:
    - Convulsive disorders
    - Indications for blood cultures
    - CSF examination
    - ARV therapy guidelines
    - Indications for perinatal post-mortem examination
    - Admission criteria for ward G1
    - Guidelines for doctors working in G-Ground outpatient/emergency ward
    - Investigation guidelines for Paediatric Emergency
  - Neonatology handbook for doctors – available for sale at secretary's office, C3A
- 

## Unit for Infection Prevention and Control (UIPC)

Head: Dr W.A J. Meintjes

Telephone: 021 938 5054 or IPC Sister on call via switchboard

Location: H-corridor, 9th floor

Website: www.sun.ac.za/uipc

**IPC manual:** available on wards and on G-drive of ward computer

**IPC survival kit:** a bag, a set of z-cards with IPC-related information and a personal 50 ml alcohol handrub is available free of charge to TBH staff.

### Standard precautions

Standard precautions (SP) are minimum infection control (IC) procedures for the care and protection of patients and healthcare workers based on risk assessment.

- **Hand hygiene:** wash and dry hands thoroughly
  - before each patient contact
  - after removing gloves
  - if hands are visibly contaminated with organic matter. Alcohol rub may be used in the absence of visible contamination, for rapid hand disinfection.
- **Protective clothing:** appropriate use for each indication:
  - gloves: all contact with blood or body fluids
  - surgical masks: aerosols or splash contamination of mucous membranes and face from blood or body fluids
  - visors: to protect eyes from splash contamination
  - plastic aprons: to prevent contamination from blood/body fluids.
- **Do not re-cap needles.** The **user** of a sharp instrument is responsible for discarding it immediately and carefully in a puncture-proof container.
- Thorough **cleaning of clinical equipment** is essential before sterilisation or disinfection.
- **Waste management:**
  - Please familiarize yourself with the waste management policy included in the IPC manual on the G-drive on the computers at ward level. All waste generated by user should be discarded on completion of the procedure by the user him or herself.

**Separate all waste items according to the colour-coded containers:**

- ▶ Yellow sharps container: used syringes, needles, blades, broken ampoules etc.
- ▶ Box with red plastic bag: infectious or clinical waste
- ▶ Black plastic bag: non-infectious or municipal waste
- ▶ Clear plastic bag: CSSD equipment

**Checklist of protective equipment required for common procedures**

Procedure	Hand disinfection	Gloves	Apron	Mask	Eye protection
IV cannulation	√	√			
Wound dressing	√	Aseptic technique			
NG tube insertion	√	√			
Airway insertion	√	√		√	√
Dental procedures	√	√		√	√ (high speed drills)
Suturing	√	Sterile √	√	√	
Central lines (CVP)	√	Sterile √		√	√
Insertion of urinary catheter	√	Sterile √	√		
Fibre-optic procedures	√	√	√	√	√
Delivery (labour)	√	√	√	√	√
Surgery (clean/dirty)	√	Sterile √	√	√	√

**BOX WITH RED PLASTIC BAG:**

- Any clinical waste that was in contact with a patient, e.g.:
  - Used bandages & dressings
  - Urinary catheter & drainage bags
  - IV admin sets
  - Abdominal swabs
  - Used syringes
  - Theatre dressings
  - Sputum holders
  - Suction catheters
  - Airways, ET tubes etc.
  - Trochars
  - Linen savers (blood, vomit)
  - Used gloves
  - Dialysis sets

**NOTE:**

Safe & responsible discarding/handling of waste is the responsibility of all staff members



**SHARPS CONTAINER:**

- Hyperdermic needles
- Stilettes
- Broken vials
- Blades
- Lancets

Broken glass (bottles, crockery) should be put in a separately sealed box and sent with ward waste.

**TRANSMISSION BASED PRECAUTIONS (always applied in addition to standard precautions)**

**Airborne precautions**, e.g. for tuberculosis, measles, chickenpox

**Droplet precaution** e.g. for diphtheria, streptococcal pharyngitis, scarlet fever, meningococcal infection, influenza, mumps, parvovirus, rubella, adenovirus, mycoplasma pneumoniae, pertussis, pneumonic plague

**Contact Precautions** e.g. for highly resistant pathogens, clostridium difficile, shigella, scabies, pediculosis, impetigo

	<b>AIRBORNE PRECAUTIONS</b>	<b>DROPLET PRECAUTIONS</b>	<b>CONTACT PRECAUTIONS</b>
	Single (private) room Door closed at all times Negative air pressure, 6–12 air changes per hour Discharge of air outside or high-efficiency filters before circulation	Single room – door may be open. If not possible, space beds at least 1 metre apart. No special ventilation required	Single room if possible, or place patients together who have active infection with the same micro-organism (cohorting).
<b>RESPIRATORY PROTECTION</b>	PTB: Wear a mask (ideally a N95 respirator) when entering room of patient with known or suspected infectious pulmonary TB patient and when disposing of secretions. Measles/chickenpox: Susceptible persons should wear a surgical mask. Persons immune to measles and chicken pox need not wear a mask.	Mask to be worn when working within 1 metre of the patient	As for standard precautions.

<b>GLOVES AND HAND-WASHING</b>	As for standard precautions	As for standard precautions	Wear gloves when entering patient's room, or making any contact with the patient, equipment or a contaminated surface. Remove gloves before leaving patient's environment and wash/disinfect hands.
<b>GOWN/PLASTIC APRON PATIENT TRANSPORT</b>	As for standard precautions  Limit the movement of and transport patients for essential purposes only. If transporting is necessary, patient must wear a SURGICAL mask (NOT an N95).	As for standard precautions  Limit movement and transport patients for essential purposes only. If transported, patient must wear a surgical mask.	Single plastic apron per patient. Change daily or when soiled. Limit overall movement and transport patients for essential purposes only.
<b>PATIENT-CARE EQUIPMENT</b>	As for standard precautions	As for standard precautions	Dedicate use of equipment to a single patient. If not possible, clean and disinfect before use on another patient.

## AUXILIARY SERVICES

### Human Nutrition

**Head: Prof R Blaauw** (021 938 9259)

Assistant Director: Ms C Schübl (021 938 4351)

3rd Floor, Medical School and 10th Floor, A Block, Tygerberg Hospital.

#### *Head of Clinical Firms*

Mrs N Esau 021 938 5168

Mrs M du Plessis 021 938 5151

Mrs S Potgieter 021 938 9264

#### *Heads of Food Service Administration Firm*

Ms N Fredericks 021 938 5612

Mrs M Marais 021 938 9136

#### *Head of Community Nutrition Firm*

Ms L Du Plessis 021 938 9175

#### *Nutrition Support nursing sister*

Sr S Boje (nee Kinnear) 021 938 4105/Radio 0538)

#### *Dietician on call*

Radio 0441 (adults)

Radio 0182 (paediatric)

#### *Secretaries*

Tygerberg Hospital 021 938 4477

University of Stellenbosch 021 938 9259

#### *Work hours*

Monday to Friday: 07:30–16:00

Saturdays, Sundays & Public Holidays: 07:30–11:30

During weekends and public holidays the dietician on call may be paged via the radio room (ext. 6666) at the above times. Only referrals for tube feeds will be seen over weekends and public holidays. No consultations or tube-feed discharges can be done over weekends and public holidays.

#### **Role of the dietician**

The dietician is responsible for the overall nutritional management of adult and paediatric patients on normal or therapeutic diets, and for providing nutritional

support in the form of total enteral or total parenteral nutrition to patients on an indication basis.

Furthermore, the dietician provides nutritional instruction on dietary modifications for patients with special nutritional needs or with disease-specific diets.

The following criteria should be used when referring to the dietician for assessment and nutritional management:

- BMI <18.5 kg/m<sup>2</sup> (adults)
- BMI >30 kg/m<sup>2</sup> (adults)
- Growth faltering or failure to thrive (children) – downward crossing of two or more centiles
- Weight loss of 10% over last 3–6 months in adults
- Inadequate oral intake
- Patients requiring artificial feeding
- Patients requiring special diets
- Uncontrolled and new diabetic patients
- Hypertensive patients
- Patients with high cholesterol, high triglycerides, high blood glucose levels
- Newly diagnosed and/or malnourished HIV patients
- Patients on ARVs
- Patients not gaining weight on the Nutrition Therapeutic Programme (NTP)
- Patients with micronutrient deficiencies
- Complications impacting on a patient's ability to eat, e.g. nausea, loss of appetite
- Lactating mothers experiencing difficulty with breastfeeding (can also be referred to a lactation consultant, midwife or infant-feeding counsellor)
- Critical care patients (ICU and high care)
- Total Parenteral Nutrition (TPN)
- Eating disorders
- Renal patients (CRF, CAPD, haemodialysis, renal transplant, ARF, nephrotic syndrome)
- Abdominal surgery
- Metabolic complications
- Oncology patients
- Liver disease
- Thermal injury
- Severe malnutrition (oedematous malnutrition)
- Refeeding syndrome
- GIT diseases (e.g. peptic ulcers, inflammatory bowel disease)
- Preterm infants/Low Birth Weight (LBW)
- Trauma surgery

In addition, dietitians may themselves identify patients requiring nutritional support or consultation.

### Procedure for requesting dietary services

Nutritional status evaluation, dietary consultation and/or Total Enteral Nutrition (TEN) support of inpatients will be attended to only at the request of a doctor by means of a written referral. Referrals must be made on admission of the patient or as soon as a diagnosis has been made.

Referrals should, as far as possible, contain the following information:

- The immediate clinical problem
- A diagnosis if available
- Supporting clinical and laboratory data
- Prescribed medication

The dietician must be notified *in advance* of a patient's referral and discharge. Liaison with the dietician may take place during ward rounds, ward visits or by telephone.

### On-call system

Radio 0441 (adults) or 0182 (paediatric)

### Adults

This service is available only for outpatients who live far from the hospital, patients in ward F1, C1E, C2A. All other outpatients referred to the dietician must be sent with a referral – with the diagnosis and *all the comorbidities* – and 3 stickers to A10 West, room 150. The patients will either be seen by the dietician on call or be booked for the department's outpatient clinic, depending on the diagnosis.

The department runs a Health-and-Lifestyle clinic where patients referred for weight loss or those with diabetes are booked at the department's outpatient clinic for group consultations consisting of two (weight loss) or three (diabetes) sessions over a period of four to six weeks.

Patients referred for conditions other than overweight/obesity or diabetes and who do not qualify to be seen immediately by the dietician on call will be booked for an individual session at the department's outpatient clinic. The Health and Lifestyle Clinic is held at 14:00 on Tuesdays for the overweight group and Thursdays for the diabetes group.

### Paediatric

This service is available for paediatric patients referred from C3A and GGr. Only patients requiring specialised nutritional management (e.g. severely

malnourished children not yet on the Nutrition Therapeutic Programme (NTP), children with biliary atresia and cystic fibrosis) should be referred. Patients requiring routine nutritional management (e.g. obesity) should be referred for management at community clinic level.

**Please note:** The dietician on call may not always be available immediately owing to other on-call consultations or other clinical duties.

### Discharge on tube feeding or supplements

Patients requiring enteral feeding via a nasogastric tube can be referred to the community for continued enteral support only after the patient has reached full feeds. The dietician must be notified in advance of such a discharge to ensure that the necessary referral letters and products (maximum 7 days' supply) are provided and training of the caregiver is carried out. Only the following products may be issued on discharge: Nutren Optimum and Glucerna (adults) or Pediasure (paediatrics). NOTE: No tube-feed or supplemental drinks discharges can be done over weekends or public holidays.

No specialised products can be supplied. (Currently, such products are not issued at Tygerberg Hospital because of limited financial resources and limited stock levels.) In **exceptional** cases, products may be issued to state-dependent patients on the recommendation of the Dietitian with a prescription of a doctor and an authorisation letter from Management (which must be attached to the prescription).

Adult and paediatric patients who are severely underweight may be placed on the Nutrition Therapeutic Programme (NTP) if they qualify according to specific and fixed criteria. Patients must be referred to the dietician, who will assess them and determine whether they qualify for the NTP. The dietician will complete the necessary referral letter and provide nutritional counselling and a starter pack with NTP products. NOTE: The NTP is *not* a form of nutritional support for patients who cannot afford food. These patients must be referred to the Social Worker.

Patients who are already on the NTP in the community should not be referred again to the dietician for another NTP referral.

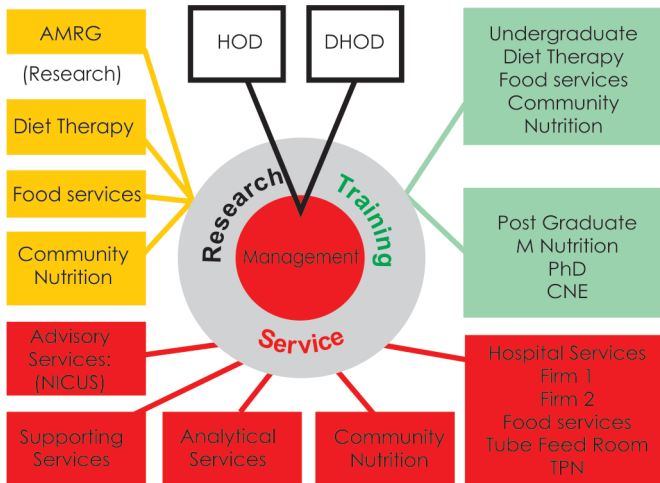
Note: Enteral products are not to be prescribed by the Dr on the medicine prescription chart. The pharmacy does not keep any stock of enteral or supplemental feeds. All patients in need of nutritional support must be referred to a Dietitian for evaluation



## Total Parenteral Nutrition (TPN)

All such referrals are dealt with by the Nutrition Support Team. Please contact the nursing sister of the Nutrition Support Team (radio 0538) after completing the referral. The Nutrition Support Team will then evaluate the patient and recommend the appropriate route for nutritional support. TPN orders have to be placed by 10h00 every day. Such referrals are replied to speedily in most cases and within 24 hours of receipt in all cases. TPN can however not be initiated over weekends

## SCHEMATIC DIAGRAMME OF THE STRUCTURE OF THE DEPARTMENT



NICUS: Nutrition Information Centre at the University of Stellenbosch

HOD: Head of Department

DHOD: Deputy Head of Department

## Occupational Therapy Division

Assistant Director: Mr E Williams (phone ext. 5962)

Tygerberg Hospital, Ground Floor, B-Block

Reception: ext. 5062 or tube number T5

Bleepers

Adult Psychiatry: 097

Burns: 335

Paediatrics: 0183/612

Neurosurgery & Neurology: 104

### Occupational Therapy Services at Tygerberg Hospital:

Strives to improve clients' abilities to fulfil all chosen occupations ("everything people do to occupy life" – Journal of Occupational Science, 2000).

### Occupations that Occupational Therapists assist clients at TBH with:

- Activities of daily living (basic self-care activities such as feeding, bathing and dressing as well as more complex activities such as assuming desired life role e.g. parent, spouse etc.)
- Work
- Schooling and
- Play

### We do this by providing

- Developmental assessment and treatment for children.
- Vocational rehabilitation as per level of care (such as work assessments, disability grant screening, recommendations for work adaptations and/or reasonable accommodation).
- Splinting
- Scar Management
- Pressure Garment Therapy
- Assistive Devices: Built-up handles for utensils, pens etc., transfer boards, bath boards, tap turners etc.
- Mobility Assistive Devices: wheelchairs, buggies, positioning.
- Occupation based Group Therapy: life-skills groups (addressing areas such as communication skills, assertiveness training, money management), educational groups (client and care-givers), support groups, stimulation groups to children, school readiness group, play therapy and anxiety management groups.
- Environmental and lifestyle adaptation.
- Specialised treatment techniques such as NDT (Neuro-developmental techniques), sensory retraining, dominance retraining etc.

- Reality orientation
- Energy-saving techniques
- Joint protection principles
- Home and work visits
- Home programs
- Cognitive and perceptual treatment for adults and children.
- Lymphoedema therapy
- Treatment of barriers to learning for non-school going children.
- Referrals to appropriate other services and professionals

### Referral Procedures

Use Tygerberg Hospital's standard referral form. Please add the name and contact number of the referring doctor and date all referrals. The following information must be included:

- Patient's name
- Patient's age
- Patient's address and contact telephone number
- Patient's diagnosis
- Any relevant or significant history
- Specific problems
- Intervention required

Please refer timeously.

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## Pharmacy

Enquiries: ext. 4916/4915/4917 (after hours: ext. 4915 only)

### Hours

#### *Outpatients*

Monday–Friday: 08:00–16:30 (closed on Christmas Day) Our OPD is not available over weekends.

#### *Inpatients*

Monday–Friday: 08:00–13:00, 14:00–16:30. Cut-off time is 14:30 after which only antibiotics or emergency requests will be accepted; Saturday, Sunday, and Public Holidays: 09:00–11:30, cut-off time is 11:30 after which only antibiotics and emergency requests will be accepted (closed on Christmas Day).

The pharmacist on call is available after hours. In an emergency you may contact the pharmacist via the after hours nursing manager on duty.

### Prescription requirements

You are required to meet the following requirements (in accordance with the Medicines and Related Substances Act, 1965 [Act 101 of 1965] as amended and provincial regulations):

- Supply the patient's name, surname, hospital number, date of birth and weight, especially for children.
- Always ensure that you use a TBH prescription sheet with the patient's correct name and folder number, as well as the correct name of the clinic/ward where applicable. Each clinic/ward/theatre has their own budget and it is important to ensure that the correct ward/clinic or theatre names are added to the prescription sheet for financial-control purposes.
- Use the generic name of the medicine (no brand names), the strength, dose and dose interval, the route of administration and period of treatment (maximum 28 days for chronic medication at one time). Write the prescription in legible handwriting and do not use any abbreviations, either Latin or otherwise.
- The signature of the doctor must appear on the prescription, as well as his/her name in print, his/her Persal number and radio-call numbers. You may apply for a stamp with your information at ext. 5752 (Ms Bindeman) and stamp each prescription.
- A prescription for chronic medication may be repeated for a maximum of 5 times, i.e. the original issue plus 5 repeats, giving a total of 6 issues on a prescription.

- Schedule 1–4 medicines may be repeated for a maximum of 5 times only.
- After Schedule 5 items are repeated 5 times, a psychiatrist must evaluate and decide whether the prescription should be repeated. Except for the Neurology and Psychiatry departments, benzodiazepines are only allowed once, and for a maximum of 14 days.
- Schedule 6 items may not be repeated. The prescription must be re-written each time. Schedule 6 prescriptions (e.g. morphine) require that the total quantity of the medication that is requested should not exceed 30 days' supply (28 days in the public sector) and that the final volume of liquid or number of tablets should also be written out in words. The doctor must add his name in print below the signature as well as his qualifications.

If you refer a patient to a community-service centre the following must appear on the referral prescription:

- Patient's name, address, and folder number
- Correct name of the institution to which the patient is being referred
- Full diagnosis, with a corresponding diagnosis on the form for each medication
- Correct generic medicine names, dosage strength, dosage intervals and the amount of repeats for each item (abbreviations, e.g. HCTZ for Hydrochlorothiazide, are not allowed).
- Original date of the prescription
- Patient's follow-up date at Tygerberg Hospital. This must be in multiples of 28 days according to the number of repeats, e.g. for 1 issue with 3 repeats the follow-up date is 4 x 28 days from the original date of the prescription. (If you deviate from this, the patient will either run out of medication or receive an oversupply of medication. Use the 28-day calendar.)
- Only medicine that is open for referral may be referred out.
- Medicine that is classified as general may be prescribed by any doctor; medicine that is classified as specialist initiated must started by a specialist in a particular field and the patient may be transferred to the periphery for follow-up repeats and continued management, medicines that are classified as specialist only may only be referred to the periphery) for a maximum of 5 months (6 issues, 1 at TBH and 5 in the periphery) after which the patient has to return to TBH for re-evaluation and a new prescription. Patients have to return to TBH for re-evaluation and a new prescription. Patients on medicines classified as tertiary hospital only may not be referred. Where such patients cannot return to TBH, an agreement must be reached with the pharmacy to assist with the process, whereby the patient, the pharmacist of the nearest hospital in the periphery and the TBH pharmacy work together in the best way to get the medicine to the patient. In these cases there must be repeat prescription in the patient's

folder at TBH.

- Ms Suzette Fourie at 021 938 4917 has to be contacted to assist with arranging this process.

### Availability and purchase of medicine

Medication available from government is subject to certain restrictions. Information is given in the Provincial Code List. (Every Head of Department has a copy.)

*Please note:*

- Any substances that do not appear in the Provincial Code List may be requested on an Individual Request Form, accompanied with a full motivation, which will be discussed by the medicine committee before a purchase is approved.
- If a product is not registered in South Africa, the Pharmacy will not stock it unless prior approval has been given by the Medicines Control Council (MCC) in Pretoria in terms of the Section 21 requirements and Hospital's Pharmaceutics and Therapeutics committee for a specific patient. Special request forms (Section 21 request forms of the MCC) are available from Pharmacy or from the internet. Such requests are based on an agreement between the doctor, the patient and the MCC only.
- A medicine that is not available at Tygerberg Hospital will definitely not be available at the community centres, which have an even more limited range of medicines.
- An emergency cupboard containing medication for inpatients is available for after-hours emergencies. Access to this is available only through the after-hours nursing manager on duty. Any medication removed from the cupboard must be recorded on the appropriate forms available in the emergency cupboard.
- Because the hospital has a limited budget for medication, you are seriously requested to prescribe medicine in a responsible manner to give each patient an equitable chance of being treated.
- Inpatients should be assessed regularly. Please change intravenous antibiotics to the oral form as soon as possible. This will avoid unnecessary costs from intravenous administration sets, needles and vaccolitres, and saves valuable nursing time.
- Before a prescription for chronic medicine is re-written, patients should be consulted to determine whether they have indeed taken their medicine to date and what supply they still have at home. The availability of unused medicine is one of the most frequent reasons for poisoning in children. It is important to know if a patient is compliant before you make a dosage adjustment.

- If uncertainty exists as to the availability, dosage or cost of a medicine, Pharmacy should be contacted at the numbers given above.
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## **PHYSIOTHERAPY DIVISION**

**Assistant Director: Ms A Swart** (Ext.4576)

B5, West, Tygerberg Hospital; ext. 5152 (messages will be conveyed)

### **WORKING HOURS**

Monday to Friday 07:30–16:00

#### *After hours*

An emergency after-hours service is available.

After-hours physiotherapy is available for chest patients according to policy 61/2006 (excluding D4, J1 & J3); policy is available in all wards.

#### *Weekend services*

Physiotherapy in ICU: as per policy 61/2006.

Ward physiotherapists will place patients whom they think require weekend chest physiotherapy on the weekend list. If you feel a patient requires weekend treatment please discuss with your ward physiotherapist or refer on Friday.

### **REFERRALS**

New referrals must reach the department by 12:00 on weekdays. They should be comprehensive and must include suspected/confirmed infectious/communicable diseases at all times. When referring, keep the following in mind:

- Contra-indications for physiotherapy: critically low platelet count, haemodynamic instability, and active haemoptysis
- Precautions for physiotherapy: fractures, osteoporosis, haemodynamic instability, low HB/HGT, raised intracranial pressure, low platelet count, malignancy – precaution to most electrotherapy modalities and certain chest physiotherapy techniques, fat and pulmonary emboli
- Appropriate and adequate analgesics should be prescribed.
- Inhalation therapy must be prescribed by the doctor and administered by nursing staff.

### **PHYSIOTHERAPY SERVICES**

Inpatient and outpatient services are available for:

- Respiratory therapy
- Musculoskeletal therapy (ROM, strengthening, rehab, including hydrotherapy, pain relief, etc.)
- Paediatric neurodevelopmental therapy
- Adult neurology – rehabilitation.

Services not provided:

- Sputum induction
- Routine mobilisation
- Manufacturing of splints
- Routine suctioning
- Wheelchairs (provided by Occupational Therapy).

### **Outpatient services**

(Only for patients living in the direct catchment area of TBH)

Procedure when referring a patient for OPD:

- Leave a detailed referral in the medical folder AND
- Phone Physiotherapy reception for an appointment.

If it is not possible to give the patient an appointment, the patient will be placed on a waiting list. Outpatients will not be treated at TBH if they arrive without an appointment arranged by Physiotherapy. Please do not provide patients with random appointment dates.

*Urgent OPD referrals should be discussed with the appropriate OPD physiotherapist.*

### **Inpatient services**

Physiotherapy services are available in most TBH wards (excluding wards D4, J1 & J3 – where there are part-time locum services). In most wards there is a specific physiotherapist allocated to that ward, except for Orthopaedics, which is allocated according to the doctor's firm. Please identify and refer patients for physiotherapy as soon as possible.

Physiotherapy students from UWC and US shadow and do clinical rotations in Tygerberg Hospital. Do not refer patients to physiotherapy students; the appropriate therapist must be contacted.

### **Inpatient referrals**

Leave the referral in clerk's office/ward arrangement and phone Physiotherapy at ext. 5152. Do not send referrals via the tube or internal mail system as these referrals are often lost or arrive late.

TBH physiotherapists will answer the written referral and *place it in the patient's medical folder.*

Referrals that are communicated late in the afternoon may only be attended to the following day.

Because the office for Mobility Assistive Devices (MADs) closes at 12:00 on Fridays, early referral is essential for same-day discharge.

## **SERVICES AVAILABLE OUTSIDE OF TBH**

### **1. Rehabilitation at an inpatient centre**

The following inpatient centres are available:

- Western Cape Rehab Centre (WCRC) in Mitchells Plain – inpatient centre for spinal, neurology and amputation patients; limited nursing care
- Conradie Care Centre in Pinelands – semi-private centre for more chronic patients; also provides rehabilitation
- Booth Memorial – semi-private, more long-term facility; limited nursing care

Neurology patients may be referred for inpatient therapy at a specialised centre. Referrals to these centres are co-ordinated by the social worker. If there is uncertainty as to the patient's suitability, please discuss the case with the physiotherapist concerned. There is a screening process and patients are admitted for a limited period only before being referred to their closest community health centre.

### **2. Outpatient physiotherapy services**

Patients should be referred to their closest day hospital/community health centre/other secondary hospitals/private practices (in the case of patients with medical aid) where services are available. Details of available physiotherapy services can be obtained from Physiotherapy reception ext. 5152.

Detailed referrals should accompany the patient because the therapists at other centres do not have access to the patient's folder or X-Rays etc.

Patients will be seen by appointment only – no walk-in patients are treated on the same day.

### **3. Home-based care**

Referral for home-based care is usually done by the ward sister when the patient is discharged.

## **MAD (MOBILITY ASSISTIVE DEVICES) SERVICES**

Ms Essie Jacobus is the staff member in attendance at ext. 4783. (The office closes at 12:00 on Fridays).

Tygerberg Hospital does not provide Mobility Assistive Devices to private patients and prison inmates. (Contact numbers for alternative sources are

available from the physiotherapist or the yellow pages). Old-age homes often have their own stock.

The issuing of mobility assistive devices is the responsibility of the discharging hospital. Wooden crutches, aluminium crutches, frames, and walking sticks are ordered by the physiotherapist or ward sister.

### **Wheelchairs**

Occupational Therapy manages wheelchair assessments as well as the wheelchair waiting list. The issuing of wheelchairs is the responsibility of the discharging hospital.

### **TED stockings**

The ward sister/doctor can order TED stockings by using the MAD requisition form (TBH0537 "Aansoek om uitreiking van hulpmiddele"). Guidelines regarding size are provided on the form. Physiotherapists are not involved in the ordering or fitting of TED stockings.

### **Slings and braces**

Doctor to order and fit.

### **Orthotics and prosthetics**

Ankle foot orthoses (AFOs) and other orthoses can be ordered by using the orthotics-and-prosthetic requisition book and sending the request to the Conradie Orthotic and Prosthetic Centre through the MAD Office.

### **Splints**

Occupational Therapy makes splints. They can be contacted at ext. 5062.

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## **Speech Therapy and Audiology**

### **Assistant director: Ms Haley Elliott**

Tygerberg Hospital, 5th floor, Gold Avenue

Reception: 4825/4

Email: haley.elliott@westerncape.gov.za (Head of Department)

candice.randall@westerncape.gov.za (Chief Speech Therapist)

gill.kerr@westerncape.gov.za (Chief Audiologist)

jenny.birkenstock@westerncape.gov.za (Chief Paediatric Audiologist)

### **Role of speech therapist and audiologist**

A *speech therapist* performs the function of assessment and remediation of speech, language-learning and feeding/swallowing disorders for adult and paediatric in- and outpatients.

An *audiologist* is responsible for assessing hearing status in adults, children and infants, including appropriate follow-up and management (e.g. hearing-aid fitting).

### **Referral procedures**

Use Tygerberg Hospital's standard referral form.

For referrals please include the following patient information:

- Patient's name
- Patient's age
- Patient's address and/or contact telephone number (in case of pending discharge)
- Patient's diagnosis
- Any relevant or significant history
- Specific problems
- Intervention required (e.g. regarding communication, hearing or feeding/swallowing)
- Please add the name and contact number of the referring doctor
- Please date all referrals

Ward patients: Please contact the department telephonically and provide the patient's name, ward and the reason for referral. Complete the referral form and place it in the patient's hospital folder.

Outpatients: Please contact the department telephonically in order to make an appointment. Please complete the referral form and place it in the patient's

hospital folder, indicating the date of the outpatient appointment on the form.

In cases where telephonic contact is not possible, email referrals can be made to the Head of Department or the appropriate Chief therapist. Please remember to include patients contact details in these cases.

*Please refer timeously. When in doubt – refer!*

### **Clinical areas: Evaluation and Treatment**

#### **Speech Therapy**

- Neurological Disorders, including CVA and traumatic brain injury
- Voice disorders
- Stuttering
- Early communication intervention (0–3 years)
- Preschool speech and language disorders
- Feeding and swallowing disorders (infants, children and adults) including modified barium swallow / video fluoroscopy
- Craniofacial abnormalities, including cleft lip and palate
- Head and neck cancer
- Autistic Spectrum disorder

#### **Audiology**

- Diagnostic testing: children and adults.
  - Neonatal infant hearing screening (in- and outpatients).
  - Electrophysiological testing (auditory brainstem response, auditory steady-state response testing).
  - Hearing-aid fitting (children and adults).
  - Aural rehabilitation.
  - Cochlear implants.
- 

## **Social Work Division**

**Social Work Manager: Mrs MN de Jager Tel. 021 938 5481**

**Social Work Consultants:**

**Mrs S Dhansay, tel 021 9385873**

**Mrs H Louw, tel 021 9384752**

**Ms N Frans, tel 021 9384527**

**Central office at Room 37, E7 West, Tygerberg Hospital**

**Telephone: 021-938 4164/021-938 5684**

The psycho-social care and re-adjustment of a patient forms an important component of the extensive treatment offered at Tygerberg Hospital, based on the World Health Organisation's definition of health as a condition of "mental, physical and social welfare".

As a professional member of the medical team, the hospital social worker gives professional attention to the psycho-social problems of both inpatients and outpatients, particularly those whose problems are connected with or arise from illness and/or hospitalisation. Among these are:

- impact of loss of work or protracted absence on the maintenance of the patient and his/her dependants owing to illness or permanent disability
- discharge problems and planning
- accommodation problems resulting from loss of income
- future care of the patient and/or dependants necessitated by protracted illness or disability
- family and marriage problems, domestic violence
- alcohol abuse, alcoholism, drug dependency
- emotional disorders, fears, worries, uncertainty and unrealistic attitudes owing to the social implications of the illness
- unwanted pregnancies, teenage pregnancies and termination of pregnancies.
- child abuse, sexual molestation of children and nutritional deficiency illnesses. (In terms of the Child Care Act (38 of 2005), all persons in whose care and treatment children are kept, are compelled to report any incidence of these problems.)
- abuse and neglect of the elderly
- HIV/AIDS counselling (pre-test and post-test)
- adjustment problems owing to chronic illness.
- Practical assistance in the form of clothing, food, toiletries, blankets and transport

Where appropriate, the social worker also makes an important contribution to the medical rehabilitation of patients. As far as possible, the co-operation of statutory and private welfare organisations and community resources is sought to offer specific services to the patient and his/her dependants or relatives.

### Referral procedure

A written referral to the social worker is required with the knowledge of the patient and his/her family. In the case of children or any other person at risk or in situations of danger/lethality, a referral may be made without consent.

### Written referrals

Written referrals should contain the following information:

- identification particulars such as name, file number, address of patient
- Clear contact details of referring doctor and referral date
- immediate clinical problem or a possible diagnosis
- reason for referral
- medical treatment plan and prognosis and possible discharge date.

No verbal referrals can be accepted. The social worker is responsible for filing written feedback in the medical file.

Liaison with the social worker may take place during ward rounds, team meetings, ward or clinic visits and by telephone. Particulars regarding social service delivery at a specific ward or clinic are generally available from the ward or clinic clerk. The Social Work department may also be contacted directly. All social workers can be reached by radio.

Services are organised on the basis of the allocation of a social worker to each clinical department. Owing to a shortage of staff, however, it is not possible to allocate full-time social workers to each department and, consequently, some social workers have to serve in more than one hospital department.

Social workers also render a service after hours, on public holidays and over weekends while a telephone consultation service is available after working hours. The social worker on call can be contacted via the hospital's switchboard.

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## INTRODUCTION

This specimen sample manual is intended as a guide to all people taking specimens that are sent to the National Health Laboratory Service – Tygerberg Coastal. This manual covers phlebotomy instructions as well as the correct sampling procedures for various other sample types. Please read the following instructions carefully before taking samples.

**Please remember that all diagnostic information from our laboratories is dependent on the quality of specimen received.**

### GENERAL INSTRUCTIONS:

1. This manual should be used as a training document and should be read and signed by all people who are responsible for taking samples that are to be sent to the NHLS TBH.
2. Please ensure that the correct procedure for the positive identification of the patient has been followed before taking any samples from a patient.
3. Samples **shall not** be processed by the laboratory if they are not labelled correctly
4. Do not pre-label samples – this may lead to erroneous labelling at times.
5. Please ensure that laboratory specimens are stored out of direct sunlight.
6. Please ensure that the correct sample container – with correct anticoagulant (where relevant) is used. All the necessary information required is covered in this manual.
7. Please ensure prompt, adequate mixing of blood samples taken into anticoagulant tubes (purple/blue top). These samples should be mixed adequately by gently inverting at least 8 times – **do not shake!** Failure to mix adequately may result in the sample clotting rendering it unsuitable for analyses.
8. Please ensure that samples are stored safely for transport and handling.
9. Please ensure that samples are not at risk to leak out or break, as the laboratory shall not process these samples.
10. Please check blood tubes for cracks before taking and sending samples.
11. Please check expiry dates on tubes before taking specimens into tubes.
12. Please ensure that safety and infection control procedures are followed at all times.
13. Please take note of the special precautions and storage instructions for certain tests. These are detailed under the relevant department doing the test.
14. If a test requested is not covered in the sampling manual, please phone the laboratory for special instructions regarding correct specimen

containers, special sampling procedures and requirements/precautions to be taken.

15. Please read the instructions at the beginning of each discipline's section for individual tests as each department may have different instructions that need to be adhered to when taking certain samples types.
16. Any after-request tests (tests not requested on original request form) must be telephonically requested with the relevant laboratory and a new request form must be faxed to the laboratory stating the additional tests required. The laboratory will inform you if the after-request can still be carried out.
17. If in any doubt regarding any aspect of our service, please feel free to contact the Laboratory at any time.

**Following these instructions will ensure that a high quality service can be maintained by the NHLS to the benefit of our clients as well as to the patients.**

### ROUTINE VENIPUNCTURE AND SPECIMEN HANDLING

#### VENIPUNCTURE PROCEDURE

The venipuncture procedure is complex, requiring both knowledge and skill to perform. Each phlebotomist generally establishes a routine that is comfortable for her or him. Several essential steps are required for every successful collection procedure:

- Identify the patient
- Assess the patient's physical disposition (i.e. diet, exercise, stress, and basal state)
- Check the request form for requested tests, patient information, and any special requirements
- Prepare the equipment, the patient and the puncture site
- Select a suitable site for venipuncture
- Perform the venipuncture
- Collect the sample in the appropriate container
- Label the collection tubes at the bedside or drawing area
- Assess the need for sample recollection and/or rejection
- Recognise complications associated with the phlebotomy procedure
- Promptly send the specimens with the request form to the laboratory

#### 1. PATIENT IDENTIFICATION

##### Verbal identification

- Greet the patient and identify yourself.
- Ask the patient to state his/her full name.

- Always ask patients to state their names.
- **Never ask**, "Are you John Tale?"
- **Remember that many patients have a tendency to say yes to anything in the outpatients setting.**
- Ask the patient's date of birth and ask them to spell their names if you want to query the patient's identity.

### Verifying identification

Examining any of the following should follow verbal identification: -

- Identity book
- Wrist band (wards)
- Ankle band (paediatric & neonates)
- Hospital/clinic card/book
- Wristband: All information on the wristband should match the details provided on the request form. **Note: a wristband lying on the bedside table may NOT be used for identification.**
- Ankle band: used for paediatric patients and newborns.
- Bed Number: a bed number on the request form cannot be used to identify ward patients.
- Hospital card/book: should be inspected to confirm the patient's name, hospital number, date of birth and doctor

## 2. COMPLETING THE REQUEST FORM

A request form must accompany each sample submitted to the laboratory (or one form if multiple tests are requested on a patient). This request form must contain the proper information in order to process the specimen. The essential elements of the request form are:

- Patient's surname and first name
- Patient's hospital number, clinic number or ID number
- Patient's date of birth and sex
- Requesting physician's complete name
- Contact number if urgent
- Person who took the specimen
- Date and time of collection
- Source of specimen
- Diagnosis
- Indicate the test(s) requested

## 3. LABELLING THE SAMPLE

**Please note: the laboratory will not process unlabelled specimens**

A properly labelled sample is essential to ensure that the results of the test match the patient. The essential elements in specimen labelling are:

- Patient's surname and first name.
- Patient's hospital number, clinic number or ID number.
- Where available make use of the addressograph sticker provided.

## 4. ORDER OF DRAW

Blood collection tubes must be drawn in a specific order to avoid cross-contamination of additives between tubes. The recommended order of draw is:

- First - blood culture bottles (yellow-black stopper)
- Second - non-additive tube (red stopper or SST)
- Third - coagulation tube (light blue stopper). A light blue stopper (sodium citrate) tube is NEVER the first tube drawn. If a coagulation assay is the only test ordered, draw a non-additive tube (red stopper or SST) first, and then draw the light blue stopper tube.

Last draw - additive tubes in this order:

- Heparin (dark green stopper)
- Oxalate/fluoride (light grey stopper)
- EDTA (lavender stopper)

**NOTE:** Tubes with additives must be thoroughly mixed (by gentle inversion and not shaking). Erroneous test results may be obtained when the blood is not thoroughly mixed with the additive, especially tests for Haematology. Overzealous mixing also results in haemolysis. Certain tests cannot be performed accurately with the presence of haemolysis.

## 5. VENIPUNCTURE SITE SELECTION

Although the larger and fuller median cubital and cephalic veins of the arm are used most frequently, wrist and hand veins are also acceptable for venipuncture.

**Certain areas are to be avoided when choosing a site:**

- Extensive scars from burns and surgery - it is difficult to puncture the scar tissue and obtain a specimen.
- The upper extremity on the side of a previous mastectomy - test results may be affected because of lymphedema.
- Haematoma - may cause erroneous test results. If another site is not available, collect the specimen distal to the haematoma.
- Intravenous therapy (IV) / blood transfusions - fluid may dilute the specimen,

so collect from the opposite arm if possible. Otherwise, satisfactory samples may be drawn below the IV by following these procedures:

- Turn off the IV for at least 2 minutes before venipuncture.
- Apply the tourniquet below the IV site. Select a vein other than the one with the IV.
- Perform the venipuncture. Draw 5 ml of blood and discard before drawing the specimen tubes for testing.
- Cannula/fistula/heparin lock - hospitals have special policies regarding these devices. In general, blood should not be drawn from an arm with a fistula or cannula without consulting the attending physician.
- Oedematous extremities - tissue fluid accumulation alters test results.

### Procedure for Vein Selection

- Palpate and trace the path of veins with the index finger. Arteries that pulsate are most elastic and have a thick wall. Thrombosed veins lack resiliency, feel cord-like, and roll easily.
- If superficial veins are not readily apparent, you can force blood into the vein by massaging the arm from wrist to elbow. Tap the site with index and second finger, apply a warm, damp washcloth to the site for 5 minutes, or lower the extremity over the bedside to allow the veins to fill.

## 6. PERFORMANCE OF A VENIPUNCTURE

Approach the patient in a friendly, calm manner. Provide for their comfort as much as possible, and gain the patient's co-operation.

- Identify the patient correctly.
- Properly fill out the appropriate request form, indicating the test(s) ordered.
- Verify the patient's condition. Fasting, dietary restrictions, medications, timing, and medical treatment are all of concern and should be noted on the lab request slip.
- Position the patient. The patient should sit in a chair, lie down or sit up in bed. Hyperextend the patient's arm.
- Apply the tourniquet 3-4 inches above the selected puncture site. Do not place too tightly or leave on more than 2 minutes.
- The patient should make a fist without pumping the hand.
- Select the venipuncture site.
- Prepare the patient's arm using an alcohol prep. Cleanse in a circular fashion, beginning at the site and working outward. Allow to air dry.
- Grasp the patient's arm firmly using your thumb to draw the skin taut and anchor the vein. The needle should form a 15 to 30 degree angle with the surface of the arm. Swiftly insert the needle through the skin and into the

lumen of the vein. Avoid trauma and excessive probing.

- When the last tube to be drawn is filling, remove the tourniquet.
- Remove the needle from the patient's arm using a swift backward motion.
- Press down on the gauze once the needle is out of the arm, applying adequate pressure to avoid the formation of a haematoma.
- Dispose of contaminated materials/supplies in the designated containers.
- Mix and label all appropriate tubes at the patient bedside. Label the tubes with the patient's name and hospital/clinic number.
- Place specimens in the appropriate collection box for delivery to the laboratory.
- For an urgent specimen request a messenger to collect this specimen immediately.

## 7. PERFORMANCE OF A FINGERPRICK

- Follow the procedure as outlined above for greeting and identifying the patient. As always properly fill out the appropriate request slip, indicating the test(s) ordered.
- Verify the patient's condition. Fasting, dietary restrictions, medications, timing, and medical treatment are all of concern and should be noted on the lab request slip.
- Position the patient. The patient should sit in a chair, lie down or sit up in bed. Hyperextend the patient's arm.
- The best locations for fingerpricks are the 3rd and 4th fingers of the non-dominant hand. Do not use the tip of the finger or the centre of the finger. Avoid the side of the finger where there is less soft tissue, where vessels and nerves are located, and where the bone is closer to the surface. The 2nd (index) finger tends to have thicker, callused skin. The fifth finger tends to have less soft tissue overlying the bone. Avoid puncturing a finger that is cold or cyanotic, swollen, scarred, or covered with a rash.
- Using a sterile lancet, make a skin puncture just off the centre of the finger pad. The puncture should be made perpendicular to the ridges of the fingerprint so that the drop of blood does not run down the ridges.
- Wipe away the first drop of blood, which tends to contain excess tissue fluid.
- Collect drops of blood into the collection device by gently massaging the finger. Avoid excessive pressure that may squeeze tissue fluid into the drop of blood.
- Cap, rotate and invert the collection device to mix the blood collected.
- Have the patient hold a small gauze pad over the puncture site for a couple of minutes to stop the bleeding.
- Dispose of contaminated materials/supplies in designated containers.

- Label all appropriate tubes at the patient bedside. Label the tubes with the patient's name and hospital/clinic number.
- Place specimens in the appropriate collection box for delivery to the laboratory or deliver the specimens promptly to the laboratory.

## 8. ADDITIONAL CONSIDERATIONS

### How to prevent a haematoma

- Puncture only the uppermost wall of the vein
- Remove the tourniquet before removing the needle
- Use the major superficial veins
- Make sure the needle fully penetrates the upper most wall of the vein. (Partial penetration may allow blood to leak into the soft tissue surrounding the vein by way of the needle bevel)
- Apply pressure to the venipuncture site

### How to prevent Haemolysis

- Mix tubes with anticoagulant additives gently 5-10 times
- Avoid drawing blood from a hematoma
- Avoid drawing the plunger back too forcefully, if using a needle and syringe, and avoid frothing the sample
- Make sure the venipuncture site is dry
- Avoid a probing, traumatic venipuncture

### Indwelling Lines or Catheters

- Potential source of test error
- Most lines are flushed with a solution of heparin to reduce the risk of thrombosis
- Discard a sample at least three times the volume of the line before a specimen is obtained for analysis

### Haemoconcentration

An increased concentration of larger molecules and formed elements in the blood may be due to several factors:

- Prolonged tourniquet application (no more than 2 minutes)
- Massaging, squeezing, or probing a site
- Long-term IV therapy
- Sclerosed or occluded veins

### Prolonged Tourniquet Application

- Primary effect is hemoconcentration of non-filterable elements (i.e. proteins). The hydrostatic pressure causes some water and filterable

elements to leave the extracellular space.

- Significant increases can be found in total protein, aspartate aminotransferase (AST), total lipids, cholesterol and iron
- Affects packed cell volume (PCV) and other cellular elements

## 9. PATIENT PREPARATION FACTORS

### Therapeutic Drug Monitoring:

Different pharmacological agents have patterns of administration, body distribution, metabolism, and elimination that affect the drug concentration as measured in the blood. Many drugs will have "peak" and "trough" levels that vary according to dosage levels and intervals. Check for timing instructions for drawing the appropriate samples.

### Effects of Exercise:

Muscular activity has both transient and longer lasting effects. The creatinine kinase (CK), aspartate aminotransferase (AST), lactate dehydrogenase (LDH) and platelet count may increase.

### Stress:

May cause transient elevation in white blood cells (WBCs) and elevated adrenal hormone values (Cortisol and catecholamines). Anxiety that results in hyperventilation may cause acid-base imbalances, and increased lactate.

### Diurnal Rhythms:

Diurnal rhythms are body fluid and analyte fluctuations during the day. For example, serum cortisol levels are highest in early morning but are decreased in the afternoon. Serum iron levels tend to drop during the day. You must check the timing of these variations for the desired collection point.

### Posture:

Postural changes (supine to sitting etc.) are known to vary lab results of some analytes. Certain larger molecules are not filterable into the tissue; therefore they are more concentrated in the blood. Enzymes, proteins, lipids, iron, and calcium are significantly increased with changes in position.

### Other Factors:

Age, gender, and pregnancy have an influence on laboratory testing. Normal reference ranges are often noted according to age.

## 10. SAFETY AND INFECTION CONTROL

Due to contact with sick patients and their specimens, it is important to follow safety and infection control procedures.

### Protect yourself

#### Practice universal precautions:

- Wear gloves and a lab coat or gown when handling blood/body fluids.
- Change gloves after each patient or when contaminated.
- Wash hands frequently.
- Dispose of items in the appropriate containers.
- Dispose of needles immediately upon removal from the patient's vein. Do not bend, break, recap, or resheath needles to avoid accidental needle puncture or splashing of contents.
- Clean up any blood spills with a disinfectant such as freshly made 10% bleach.

#### If you stick yourself with a contaminated needle:

- Remove your gloves and dispose of them properly.
- Squeeze puncture site to promote bleeding.
- Wash the area well with soap and water.
- Record the patient's name and ID number.
- Follow your institutions guidelines regarding treatment and follow-up.

**NOTE:** The use of prophylactic zidovudine following blood exposure to HIV has shown effectiveness (about 79%) in preventing seroconversion

### Protect the patient

- Place blood collection equipment away from patients, especially children and psychiatric patients.
- Practice hygiene for the patient's protection. When wearing gloves, change them between each patient and wash your hands frequently.

## 11. TROUBLESHOOTING GUIDELINES

#### If an incomplete collection or no blood is obtained: -

- Change the position of the needle. Move it forward (it may not be in the lumen)
- Or move it backward (it may have penetrated too far).
- Adjust the angle (the bevel may be against the vein wall).
- Loosen the tourniquet. It may be obstructing blood flow.

- Try another tube. There may be no vacuum in the one being used.
- Re-anchor the vein. Veins sometimes roll away from the point of the needle and puncture site.

#### If the blood stops flowing into the tube: -

- The vein may have collapsed; re-secure the tourniquet to increase venous filling. If this is not successful, remove the needle, take care of the puncture site, and redraw.
- The needle may have pulled out of the vein when switching tubes. Hold equipment firmly and place fingers against patient's arm, using the flange for leverage when withdrawing and inserting tubes.

#### Problems other than an incomplete collection: -





- A haematoma forms under the skin adjacent to the puncture site - release the tourniquet immediately and withdraw the needle. Apply firm pressure.
- The blood is bright red (arterial) rather than venous (dark red). Apply firm pressure for more than 5 minutes.




## 12. BLOOD COLLECTION ON BABIES

- The recommended location for blood collection on a newborn baby or infant is the heel.
- Pre-warming the infant's heel (42° C for 3 to 5 minutes) is important to obtain capillary blood for blood gas samples and warming greatly increases the flow of blood for collection of other specimens. However, do not use too high a temperature warmer, because baby's skin is thin and susceptible to thermal injury.
- Clean the site to be punctured with an alcohol sponge. Dry the cleaned area with a dry cotton sponge. Hold the baby's foot firmly to avoid sudden movement.
- Using a sterile blood lancet, puncture the side of the heel. Do not use the central portion of the heel because you might injure the underlying bone, which is close to the skin surface. Do not use a previous puncture site. Make the cut across the heelprint lines so that a drop of blood can well up and not run down along the lines.
- Wipe away the first drop of blood with a piece of clean, dry cotton. Since newborns do not often bleed immediately, use gentle pressure to produce a rounded drop of blood. Do not use excessive pressure or heavy massaging because the blood may become diluted with tissue fluid.
- Fill the capillary tube(s) or micro collection device(s) as needed.
- When finished, elevate the heel, place a piece of clean, dry cotton on the puncture site, and hold it in place until the bleeding has stopped.

- Be sure to dispose of the lancet in the appropriate sharps container. Dispose of contaminated materials in appropriate waste receptacles. Remove your gloves and wash your hands.

#### LIST OF TUBES USED FOR PHLEBOTOMY

Collection Tube	Additive	Mode of Action	Uses
Red Top (Plain) 	None	Blood clots and the serum are separated on centrifugation.	Chemistry, Immunology, Toxicology & Serology.
Gold 	None	Serum separator tube (SST) contains a gel at the bottom to separate blood from serum on centrifugation.	Chemistry, Immunology & Serology. Do <b>not use</b> for Antibiotic or Toxicology requests.
Purple 	EDTA liquid	Forms calcium salts to remove calcium	Chemistry Homocysteine, PTH, HbA1C, Red Cell Folate Haematology (FBC), Blood Bank (Crossmatch), CD4 counts and viral loads - invert 8 times to prevent clotting and platelet clumping. Chemistry (HBAC1); (Homocysteine & PTH on ice)
Light Blue 	Sodium citrate	Forms calcium salts to remove calcium	Coagulation tests (INR and PTT), <b>full draw</b> required - invert 8 times to prevent clotting and platelet clumping. Note: PTT stable for 6hrs after drawn-must reach lab at least within 4hrs after drawn in ward.

Dark Green 	Sodium heparin or lithium heparin	Inactivates thrombin and thromboplastin	Chemistry Transketolase, for lithium level, use sodium heparin For ammonia level or Trop-T, use sodium or lithium heparin. Ketones on ice (to reach lab within 15 minutes of phlebotomy) Immunology Oxidative Burst Test-to reach laboratory within 1 hr of blood draw.
Light Grey 	Sodium fluoride and potassium oxalate	Anti-glycolytic agent preserves glucose up to 5 days	Chemistry Lactate, Glucose's, requires <b>full draw</b> (may cause haemolysis if short draw) Lactate on ice
Black 	Sodium citrate (buffered)	Forms calcium salts to remove calcium	Westergren Sedimentation Rate (ESR); requires full draw

#### DIVISION OF ANATOMICAL PATHOLOGY

Head: Prof Johann Schneider

Telephone Number: 021 938 4048 Emergency contact details: 082 326 8772

Secretary: Elke van Wyngaardt: 021 938 4041

#### Consultants:

Prof Johann Schneider (Executive Head Pathology)	021 939 4965
Prof Juanita Bezuidenhout	021 938 4211
Dr William Bates	021 938 5553
Dr Leocardea Schroeter	021 938 4044
Dr Pawel Schubert	021 938 5349
Dr Mercia Louw (Head of Cytopathology)	021 938 4045
Dr Noor Mohamed	021 938 6163
Prof Peter Wranz	021 938 4046

Prof Richard Hewlett (Head of Neuropathology) 021 938 9689  
Dr Dan Zaharie 021 938 9535  
Dr Len Anstey 021 938 5224  
Prof ROC Kaschula 021 938 4947

Results: 021-938 4330/ 4904/ 4931  
Enquiries: Histology 021 9385226  
Cytology 021 938 4200 / 938 4202

There are four main subdivisions of the service:

- 1: Surgical diagnoses – including biopsies and other tissue specimens.**
- 2: Autopsies**
- 3: Cytology – including gynaecology exfoliative and fine needle aspirations.**
- 4: Oral & Maxillofacial Pathology**

## **1. SURGICAL DIAGNOSES**

### **1.1 Routine services:**

The Department provides a daily service. Specimens are received from the theatres, wards, clinics and other institutions. Specimens are received daily from 07:30 to 15:30

Depending on the size of the specimen, which has an influence on the fixation time, the specimen will be trimmed and processed between 2 and 24 hours of receipt.

The process includes dehydration of the specimen and impregnation with paraffin wax. The process is usually completed in 13 hours.

The specimen is then sectioned, processed, embedded, cut, stained and sent to the registrar for provisional evaluation. As soon as possible thereafter the specimen is examined by the registrar and consultant and the report is taken to the typists for typing.

The time-span from receipt of the specimen to final posting of the report varies from 48 to 72 hours.

Anatomical Pathology request forms must be legibly and completely filled out to be accepted by the Division. Failure to do so will inevitably lead to delays

in processing of the specimen. The request forms are available from Dept. Anatomical Pathology.

ALL specimens are received at SPECIMEN RECEPTION, which is manned from 07:30 to 16:00 daily. (See emergency service).

Immediate fixation in 10% Formal Saline (Formalin) is essential for the preserving of tissue.

Formalin is available in theatres, wards, clinics and at the reception area of Anatomical Pathology.

### **Factors influencing the speedy availability of the report include:**

- 1.1.1 Size of the specimen – adequate formalin fixation of large specimens may need 24 hours. Remember: the volume of formalin should be 10 times the volume of the specimen.
- 1.1.2 Specimens that is lost in the theatres or elsewhere in the hospital.
- 1.1.3 Special stains – are done to elucidate specific characteristics of the tissue and may delay diagnoses for at least 24 hours.
- 1.1.4 Specimens requiring decalcification
- 1.1.5 Incorrectly labelled specimens

### **1.2 Special services (Enquiries: telephone 4040 or pathologist on call).**

#### **1.2.1 Immunofluorescence laboratory (Telephone 5676)**

FRESH unfixed tissue wrapped in a swab moistened with normal saline in a sealed container must be sent immediately and be clearly marked "for immunofluorescence examination – fresh unfixed tissue".

#### **1.2.2 Electronmicroscopy (EM) (Telephone 4213)**

2 or 3 small (5mm x 1cm) blocks of a representative well-preserved area of tissue which has been fixed in GLUTARALDEHYDE. Glutaraldehyde is obtainable in theatres and from the EM lab at Tel 4213.

### **1.3 Urgent specimens:**

- 1.3.1 **Expedited diagnosis:** An expedited diagnosis may be arranged by the registrar or consultant, with the pathologist on emergency duty (bleeper



or Tel 4200) on the day prior to the diagnosis, for a telephonic result by 10:00 on the day following receipt of the specimen.

- 1.3.2 **Emergency diagnosis:** Very urgent specimens which need a diagnosis within 4 – 6 hours must be arranged with the pathologist on emergency duty by the registrar or consultant.

#### **Procedure:**

During working hours contact the pathologist on call on the pager.

After hours contact the pathologist on call on the pager or home number/cell, which is obtainable from the telephone exchange at the hospital.

The pathologist, registrar and technologist on emergency call are all available on pagers (number available from the telephone exchange).

- 1.3.3 **Frozen section diagnosis:** The surgeon who requires an intra-operative diagnosis usually requires this investigation.

All routine frozen sections as well as emergency, frozen sections must be arranged with the pathologist on emergency duty who will ensure that the emergency team (registrar and technologist) is ready to receive the specimen.

Routine frozen sections should be arranged the day before the operation is undertaken with the pathologist on emergency duty.

#### **Reports:**

It is the policy of the Department to issue printed reports wherever possible.

#### **Reasons for this are as follows:**

- 1.4.1 To ensure that faulty information is not transmitted telephonically; this has a direct impact on the well being of the patient.
- 1.4.2 To obviate differing interpretations by different clinicians of telephonic messages.
- 1.4.3 To restrict to an absolute minimum unnecessary time wasting and duplication of enquiries as well as to restrict telephonic enquiries to the absolute minimum.

## **REPORTS ARE POSTED DAILY AND SHOULD BE AVAILABLE ON THE DISALAB WARD ENQUIRIES COMPUTER IN THE WARDS.**

Telephonic enquiries (Tel 938 4330/ 4904/ 4931)

The clerk at specimen reception may under NO circumstances issue telephonic reports. Copies of the printed report may be requested and fetched from the clerk at the specimen reception. Should a report not be available at specimen reception then the clinician is free to contact the registrar to whom the case has been assigned.

## **2. AUTOPSIES**

Because there is confusion as to the correct manner in which to request an autopsy as well as to obviate problems that may be encountered during the performance of such a procedure it is suggested that the following guidelines be followed:

The Department of Forensic Pathology has approved these guidelines.

In the event of a "natural death" (see Forensic Medicine), an autopsy can be requested, for academic purposes or to determine the **exact cause of death**.

### **2.1 Request of autopsies**

The following must be sent to reception (tel no 5226) as soon as possible after the post-mortem has been requested.

- 2.1.1 The folder, X-rays and other relevant test results of the deceased patient.
- 2.1.2 "Notification/Register of Death/Still birth" (B1 1663) – the ward staff completes the entire form except Sections D and G. If sections D and G are accidentally completed by the clinician, and the request for a post-mortem from the Division of Anatomical Pathology is made at a later stage, the body might have already been handed over to the family or undertaker.
- 2.1.3 Consent from family – (form 3 – closest relative). If no person is available to grant consent, please contact the Clinical Executive Officer on call. The Clinical Executive Officer can then give written consent for such a post-mortem. If telephonic consent is obtained, 2 witnesses must also sign the form. Faxed consent is acceptable, with two witnesses.

2.1.4 Complete form 2 – the clinician requesting the autopsy (preferably the consultant or registrar) so that the department knows to whom the report is to be sent.

2.1.5 Autopsy Examination request form – a relevant summary of the clinical picture. The more precise and relevant the information provided, the more specific the post-mortem examination is directed at solving any problems.

2.1.6 The above forms (TH 310/10.89 5010780/TH 9/2/93 5008778/TH 10/2.93 5008786/TH 11/2.93 5008794) should be available in every ward and can be obtained from the photocopy room, by the ward clerks.

**SHOULD THERE BE ANY UNCERTAINTY/PROBLEMS WITH THE NATURE OF THE DEATH PLEASE CONTACT THE FORENSIC PATHOLOGIST ON EMERGENCY DUTY**

## 2.2 Attendance at autopsies

Arrangements can be made between the pathologist on call and the clinician involved. There is an autopsy discussion on all adult autopsies daily at 12.15 in the mortuary.

## 2.3 Rejection of post-mortems

Autopsies are occasionally rejected at the discretion of the consultant on call /head of discipline. No autopsy is indefinitely rejected and further motivations will always be considered in these cases.

## CYTOLOGY LABORATORY

**Please note that cytology has its own separate request form (CYT1.2) and requires the following information:**

- Name of patient
- ID no / Date of birth
- Location / Ward
- Date of collection of specimen
- Referring doctor
- Nature/origin of specimen
- Adequate history including previous treatment eg. Previous radiotherapy
- Previous histology and cytology reference numbers.

**Please note that the laboratory is legally entitled to return specimens which do not have these details legibly supplied.**

**Specimens can be delivered on the 10th floor - E-passage Cytology Room 2351**

**or the Corelab on the 9th floor in TBH complex**

**Please discuss urgent cases with the laboratory (ext. 4202, 4200) or pathologists (ext. 4045, 6163, 5349) as these will only be done by prior arrangement. Contact the Laboratory or the Pathologists before taking the sample to ensure optimum handling of the specimen. For after-hour call-outs, dial radio room at 6666 for pathologist on call.**

- For **urgent cases** make sure that the request form contains a **contact number** as well as a **time /date** by when the result is required.
- If **more than one investigation** is to be done, (e.g. pleural fluid for Cytology and TB culture) please submit **separate specimens and request forms** (where possible)
- It is very important that slides prepared by the clinician e.g. cervical smears, brushings and FNA's are fixed promptly and correctly to optimize cytodiagnosis. Please see Addendum 1 on correct fixation of specimens.
- **Slide holders** are available on request from the **Cytology laboratory**. **All other clinics** may order **slide mailers** and **request forms, free of charge**, from **NHLS, Green Point** (stores).

**Order forms available from the lab or Green Point stores.**

**Ph 021 417 9322 / 9324**

**Fax 021 421 3501**

### Take note of the following when labeling slides:

- Please write **FULL NAME, SURNAME, FOLDER NUMBER** or **DATE OF BIRTH** and **LOCATION**
- Please use standard slides with **frosted end** for labeling.
- Please label with **PENCIL ONLY** on frosted end (use diamond pen to scratch name on non-frosted slides).
- **NEVER use STICKERS or INK** to label slides as they do not withstand the staining process.
- Name and smear should be on the **same side** of the slide.
- Please **do not send an unlabeled slide in a labeled container**.

## Cytological Tests According to Organ System

### Female genital tract

1. Cervical smear
2. Vaginal smear
3. Vault smear
4. Endocervical smear
5. Endometrial smear
6. Vulvar smear

### Please state clearly on the requisition form:

- Date of last menstrual period (LMP)
- If patient is currently pregnant
- Years menopausal
- Relevant history eg previous procedures (eg cone biopsy, radiation treatment and date of these procedures) or previous conditions eg. atypia or carcinoma
- Appearance of the cervix



### Collection notes:

- Please use standard glass slides with **frosted end** for labeling.
- Spray-fix **IMMEDIATELY** after taking smear (within 10 seconds)
- **Please see above notes on labeling slides!**
- Allow smears to dry before packing for transporting to the lab
- Please **do not** use the Cytology request form to **directly wrap** the papsmear slides, as this poses an infection risk.
- **Slide holders** are available on request from the **Cytology laboratory, all other clinics** may order **slide mailers and request forms, free of charge, from NHLS, Green Point (stores).**

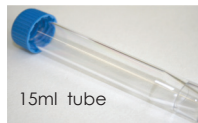
[Order forms available from the lab or Green Point stores.](#)

Ph 021 417 9322 / 9324

Fax 021 421 3501

### Respiratory system

- Sputum
- Bronchial brushings
- Bronchiolar-alveolar lavage (BAL)
- Bronchial washings
- Tracheal aspirates



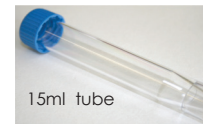
- Pharyngeal brushings
- Antral aspirates /sinus washings
- Nasal smears

### Collection notes & Fixation:

- Please submit sputum after an **early morning deep cough** to ensure that sputum, and not saliva, is collected.
- Containers with fixative (Carbowax) are available at reception at 10th floor, E-passage, Room 2371.
- For outside clinics, use plastic specimen container and fix these fluids with an equal amount of 50% to 70% alcohol.
- Please make sure that if multiple specimens were collected by use of different techniques or from different sites – the **specimen type is clearly marked** on the container.
- The 45ml screw top container is used for sputa, while smaller amounts like bronchial lavages are normally collected in the 15ml screw top tubes.

### Fluids

1. Pleural
2. Peritoneal
3. Pericardial
4. Hydrocoele
5. Cerebrospinal fluid
6. Cyst fluid
7. Peritoneal washings



### Collection notes:

- Please ensure that the fluids reach our laboratory as soon as possible – in case of a **delay of more than 24h**, please add **equal amount of 50% alcohol (please indicate if alcohol was added).**
- **Cerebrospinal fluid** must reach the lab (Room 2371) preferably within **4h** after tap to prevent cellular degeneration. If not possible, fix with **equal amount of 50% alcohol.**
- For small amounts of fluid, 15ml screw top tubes are used, while the 75ml screw top container is used for larger amounts.
- Please send full volume of fluid drained. If a litre bottle is used, please ensure it is sealed properly, especially for glass bottles.

### Gastro-intestinal tract

Oesophageal brushing  
Gastric brushings  
Duodenal brushings  
Pancreatic duct aspirates  
Bile duct aspirates / brushings  
Colonic brushings



75ml screw top

### **Collection notes:**

- It is very important that the slides are fixed immediately (within 10 seconds) with cytological spray fixative to prevent degeneration of cells. See Addendum 1 on correct fixation of specimen.

### Urogenital tract

Voided urine  
Catheterized urine  
Ureteric urine  
Renal cyst aspirate  
Renal pelvis brushings  
Urethral smear

### **Collection notes:**

1. Please state clearly if the patient has recently:
  - Undergone catheterization
  - Undergone cystoscopy
  - Undergone retrograde radiography
2. Cells in urine deteriorate rapidly. Specimens must reach the lab within 2h, if not possible **an equal amount of 50% alcohol** may be added.
3. Please note that early morning urine and 24h urine collections are unsuitable for cytodiagnosis. (midstream collection most suitable)
4. Urine is normally collected in 75ml screw top containers.

### The breast

Nipple discharge  
Nipple smears  
Breast aspirate  
Cyst aspirates

### **Collection notes:**

- Spray-fix immediately (within 10 secs)

- If **more than 2 smears** are made, one could be left unfixed for giemsa stain, but should be clearly **marked "unfixed" on slide.**

### Other Fine needle aspirations (FNA)

1. Superficial palpable lesions
2. Impalpable/ deep / image guided FNAs

### **Collection notes:**

- Spray-fix immediately (within 10 secs)
- If **more than 2 smears** are made, one could be left unfixed for giemsa stain, but should be clearly **marked "unfixed" on slide.**

Slides may be sent by porter or via specimen depot.

\*See **Addendum II** on FNA

### Cytology FNA Clinic

Patients may be sent to the FNA clinic for aspiration of superficial, palpable lesions.

- Appointments are not necessary.
- The clinic is located on the 10th floor, East Side, Room 171. There are signs that can be followed in the Green Passage.
- The clinic operates from 10am to 1pm, Monday to Friday, on a first come first serve basis.

- **Please remind the patients** to bring their referral letters and patient files.

### **2. Impalpable/ deep / image guided FNAs (on-site theatre FNA's)**

- Cytology offers an on-site staining and diagnostic service for adequacy of aspiration from deep-seated lesions in wards, CT Scan, sonar, bronchoscopy and surgical theatres.
- Contact 4045, 5349, 4048 or 6163 to request this service.

### Miscellaneous

Tumour imprints  
Lymph node imprints  
Skin smears  
Tzank smears  
Ulcer smears  
Tissue imprints  
Diaphragmic wipes

### Collection notes:

- Adequate and rapid fixation is essential
- Please note that material on a swab is not suitable for cytology.

### Reports

- It is the policy of the Department to issue printed reports wherever possible.
- Clerks may under NO circumstances issue telephonic reports. Reports can be faxed to the requester.

### Reasons for this are as follows:

- To ensure that faulty information is not transmitted telephonically; this has a direct impact on the well being of the patient.
- To obviate differing interpretations by different clinicians of telephonic messages.
- To restrict to an absolute minimum unnecessary time wasting and duplication of enquiries as well as to restrict telephonic enquiries to the absolute minimum.

**Telephonic results** (Tel 021 938 4330/ 4904/ 4931)

**REPORTS ARE POSTED DAILY AND SHOULD BE AVAILABLE ON THE LAB WARD ENQUIRIES COMPUTER IN THE WARDS.**

### Special stains

Special stains are available e.g. Ziehl-Neelson for TB, silver stains for fungi etc. Other special investigations available include immunocytochemistry, flowcytometry

### Addendum I

#### PROPER FIXATION TECHNIQUE

1. Air-drying of a specimen causes distortion and loss of cytoplasmic density. Crisp nuclear chromatic patterns are lost and the cytoplasm cannot be coloured properly. Hence rapid fixation is a vital step in cytological preparations.

When the clinician is preparing a slide e.g.pap smear or bronchial,

oesophageal or gastric brushings, the smear should be made in one direction with one motion and the doctor should avoid the same area twice. All prepared slides should be sprayed with cytological fixative immediately to prevent specimen degeneration.

2. Please use cytology slides only, with a ground glass edge to prevent traumatising of cells.
3. Check expiry date on spray fixative

### Addendum II

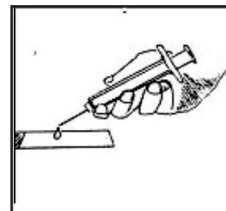
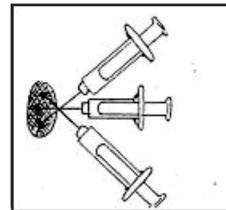
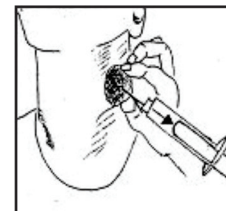
#### METHOD OF FINE NEEDLE ASPIRATION (For Cytology)

#### MATERIALS:

22 or 23 gauge needle  
10 cc syringe  
Clean glass slides (2 – 4 slides, with frosted ends)  
(4 = 2 Pap (fixed) + 2 unfixd – air-dried)  
Slides clearly labelled with patient's details  
Cytology spray fixative  
Pencil  
Alcohol swabs

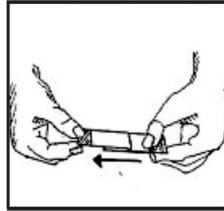
#### METHOD: (see drawings)

- Use pencil to ensure that patient's details are clearly identifiable on each slide.
- Clean area on skin with alcohol swab.
- Ensure that all air is expelled from syringe and that plunger moves smoothly.
- Attach needle to syringe.
- Fix target lesion between thumb and forefinger.
- Push needle through subcutaneous tissue into lesion.
- Apply 1 – 2 mm constant suction while aspirating, moving needle firmly in different directions Aspirate until material is present in hub of needle.
- Equalize pressure before pulling needle out by releasing all pulling action on



plunger.

- Place sterile swab on area and pull out.
- Remove needle from syringe, aspirate 10cc air into syringe, re-attach needle and firmly push plunger down, with tip of needle on glass slide, 1cm from frosted end.
- Place another slide onto expressed material, without pressure, allow the material to disperse.
- Firmly and slowly pull slides apart in a horizontal direction.
- **NB! IMMEDIATE FIXATION IS ESSENTIAL FOR OPTIMAL CELLULAR DETAIL.**
- Shake and hold Spray fixative can 30cm away from slide. Spray-fix one slide immediately.
- Allow other one slide to air-dry.
- More than one pass is necessary if insufficient material was obtained. Repeat procedure.
- Complete cytology request form as comprehensively as possible.
- Detailed sketches are essential to facilitate diagnosis.



### Addendum III

#### **HOW TO TAKE THE PERFECT PAP SMEAR**

1. Get everything ready
2. Label slides and forms
3. Do smear first – before PV
4. Spread labia
5. Insert speculum dry or moisten with saline (not tap water)
6. Visualise external os
7. Swab cervix free of blood / discharge
8. Scrape full circumference firmly
9. Lay spatula flat on the side
10. Spread along the length of the slide  
Should you make use of a cervibrush
  - `Insert into os
  - `Turn clockwise 360°
  - `Roll onto slide
11. Sprayfix immediately (within 10 secs)
12. Allow slide to dry (after fixation) before packing to send off.

#### **4. ORAL & MAXILLOFACIAL PATHOLOGY (in association with ANATOMICAL PATHOLOGY and the TYGERBERG ORAL HEALTH CENTRE of THE UNIVERSITY of the WESTERN CAPE)**

**NHLS Head of Discipline: Prof JJ HILLE**

The discipline of Oral & Maxillofacial Pathology is a speciality of both Dentistry and Pathology which deals with the nature, identification, and management of diseases affecting the oral and maxillofacial regions. It is a science that comprehensively investigates the causes, processes and effects of these diseases. The practice of Oral & Maxillofacial Pathology includes diagnosis of diseases using clinical, radiographic, microscopic, biochemical and other examinations, and management of patients. As such this discipline not only adds special value to Anatomical Pathology and the other pathology disciplines, but also to the clinical disciplines of Maxillofacial & Oral Surgery, Oral Medicine and Dermatology in the management of complex oral mucosal diseases, and to General Surgery, Ear-Nose-Throat Surgery and Oncology in head & neck cancer management.

The discipline offers the following services:

1. Surgical pathology diagnoses – including biopsies and other tissue specimens (e.g. resections) from the oral cavity, jawbones and surrounding anatomical regions. Kindly refer to the description of the routine diagnostic service in Anatomical Pathology for further details and array of special services. Please submit whenever possible a (panoramic) radiograph and/or CT scans for accurate diagnosis of bone lesions. Note that frozen sections on bony specimens are not possible.
2. Microscopic examination of oral mucosa surface brushings to detect fungal infection and bacterial overloads. Kindly sample with a cervi-brush and submit exfoliative smears (on glass slides fixed with cytospray or alcohol) to the anatomical pathology laboratory with the specific request to stain for PAS.
3. On-site clinical and radiological consultations in oral mucosal diseases and jaw lesions on request (see contact details below).
4. Punch and/or scalpel biopsies, surface cytology brushings/modified deep (semi-invasive) cytology sampling for oral mucosal lesions and fine needle aspirations/core needle biopsies of oral deep soft tissues can be performed under local anaesthesia in the FNA clinic on the 10th floor with prior arrangement (see contact details below).

**Staff:**

Consultants: Prof JJ Hille (X 6159 or 082-5560703).  
 Prof VM Phillips (phone 9373161) **NB:** Forensic odontology  
 Registrar: X 4449 or tel 9373158

**ALL URGENT SPECIMENS MUST BE ARRANGED WITH THE LABORATORY.****CHEMICAL PATHOLOGY**

The Discipline of Chemical Pathology is situated on the 9th floor of the hospital.

**Contact Details**

Head of Discipline:	Prof. RT Erasmus	4107
Consultants:	Dr C Meyer	4168
	Dr A Zemlin	4254
	Dr M Hoffman	4165
	Dr M Rensburg	4927
Registrars:	Dr C Hudson	4174
	Dr N Vanker (Rotating clin path)	4174
	Dr I Smit (Rotating clin path) Dr L Basso	4150
	Dr D Phathlane	4150
Consultations	Monday-Friday (08h00-17h00)	4330
	After hours (telephonically)	4934/4330
Urgent requests	All hours	4934
Any test not listed		4330 / 4934
Results/Information	Core hours (After hours, weekends)	(4936)
Automation		4936
Protein-electrophoresis		4258
Urine- and stool investigations		4171

**General Instructions:**

- Blood gas specimens: arterial blood; not in contact with air; on ice; replace needle with cap; send to lab as soon as possible. Within 30 minutes.
  - Creatinine clearance: clotted blood must be taken AT THE SAME TIME AS 24h urine collection, i.e. during collection period. Include mass and height.
  - Porphyrins: urine and stool; light sensitive specimens – transport container in black bag. Please send 15ml EDTA blood (purple top tube) for genetic tests with each request.
  - Bence-Jones protein: send 50ml FRESH urine in azide container (obtain container from laboratory)
  - Neonatal bilirubin: protect against light.
  - 24-hour urine collection: obtain container from lab for the specific test – different substances require different preservatives. Do not discard fluid (preservative) in bottle. Follow instructions on label or from lab.
  - For, HVA, Fractionated MA determination, AVOID the following:
  - Coffee, Tea, Citrus Fruits, Vanilla Containing Compounds
  - Drugs: Chlorpromazine, Methyldopa, Naladixic Acid
  - for 3 days prior to collection.
  - Stool Alpha-1-antitrypsin: collect a pre-weighed container from the laboratory. A minimum of 10g (half a 40ml urine container) of stool is required for quantification. A blood sample must be collected at the same time for clearance estimation.
  - Stool Reducing substances request must be sent separately from a Microbiology test request ( a separate request form and specimen).
  - Osmol requests blood or urine must be submitted on ice.
  - Pyruvate to be arranged with the laboratory.
  - Sweat test to be arranged with the laboratory.
  - Fractionated NMA / VMA ideal sample is three (3) consecutive 24 hour collections
  - Urine Cortisol must arrive in the laboratory as soon as the 24 hr collection is completed. Should a delay occur then 10g of Boric acid per litre must be added to collection .
- Send all specimens to lab a.s.a.p..
  - Request forms must be completed in detail

**Index of tests**

1. Urea and electrolytes
2. Liver function tests

3. Blood gasses
4. Calcium magnesium and phosphate
5. Iron studies
6. Trace elements
7. Enzymes/ Special proteins
8. Cardiac markers
9. Electrophoresis
10. Lipogram
11. Hormones
12. Tumor markers
13. CSF investigations
14. Tests on urine and stool
15. Fluids
16. Other tests
17. Tests send to other laboratories (See note 2)
18. Steatocrit (stool)

**Please note:**

1. Only **certain adult reference values** currently in use at TBH are provided. Reference values can change depending on the technique used to analyze the specimen. Some reference values are **age dependent**. If further information is required, please contact the laboratory.
2. Specimens can be sent to other laboratories. Please contact the laboratory for any tests not mentioned on the list.

**1. Urea and electrolytes**

Sodium	Yellow	135 -147 mmol/l
Potassium	Yellow	3.3-5.3 mmol/l
Chloride	Yellow	99-113 mmol/l
Urea	Yellow	2.6-7.0 mmol/l
Creatinine	Yellow	60-120 µmol/l

**2. Liver functions**

Total Protein	Yellow	60-85 g/l
Albumin	Yellow	35-52 g/l
Total Bilirubin	Yellow	0-21 µmol/l
Conjugated Bilirubin	Yellow	0-6 µmol/l
Aspartate Transaminase (AST)	Yellow	8 - 20 U/l

Alanine Transaminase (ALT)	Yellow	5 - 40 U/l
Gamma-Glutamyltransferase (GGT)	Yellow	1- 24 U/l
Alkaline Phosphatase(ALP)	Yellow	40-120
Laktate Dehydrogenase (LDH)	Yellow	100-190 U/l
Ammonia	Green Heparinised blood on ice	
Lactate	Grey (fluoride tube) on ice	

**3. Blood gasses**

pH	<i>Heparin, on ice</i>	7.73 – 7.43
pCO <sub>2</sub>		4.50 – 6.10 kPa
pO <sub>2</sub>		11.00 – 15.00 kPa
HCO <sub>3</sub>		21.0 – 25.0 mmol/l
Base excess		-4 to +2 mmol/l
O <sub>2</sub> Sat		95 – 98 %

**4. Calcium, magnesium and phosphate**

Calcium (corrected)	Yellow	2.05-2.56 mmol/l
Magnesium	Yellow	0.65-1.10 mmol/l
Phosphate	Yellow	0.80-1.40 mmol/l

**5. Iron studies**

Iron	Yellow	10 - 30 µmol/l
Transferrin	Yellow	2.0-3.6 g/l
% Saturation (Fe)	Yellow	20-50

**6. Trace elements**

Copper	Clotted blood	0- 0.47 µMol/l
	Urine-24 h (Mineral free)	10- 26 µMol/l
Zinc	Plastic screw top tube or special trace metal tube	40- 34 µMol/l



## 7. Enzymes/ Special proteins

Haptoglobin	Yellow	0.30- 2.00 g/l
Beta- microglobulin	Yellow	1.0 – 3.0 mg/l
Caeruloplasmin	Yellow	0.20 -0.60g/l
CRP	Yellow	0.20 -0.60g/l
Alpha-1 antitrypsin	Yellow	19 yr to adult 0.90- 2.00 g/l
ADA	Pleural fluid	< 25U/l values >60 suggestive of TB, septic effusion, lymphoma, leukaemia, TB
	Pericardiac fluid	
	Ascitis fluid	
	CSF	< 4U/l > 6U/l suggestive of TB meningitis
Pyruvate ( arrange ext 4258 )	Whole blood	30 -80 µmol/l

## 8. Cardiac markers

CKMB	Yellow	>3% suggestive of cardiac origin
Troponin I	Yellow	0,00 – 0,07 g/l
Units and range to change		< 0,07: Normal 0,08 – 1,5: High risk > 1,5: possible infarct
Creatine kinase (CK)	Yellow	26-140 U/l

## 9. Electrophoresis

Immunoglobulin G	Yellow
Immunoglobulin M	Yellow
Immunoglobulin A	Yellow
Serum Electrophoresis	Yellow
Urinary Electrophoresis	Urine in preservative
Immunofixation	Yellow
Immunofixation	Urine in preservative

## 10. Lipogram

Total Cholesterol	Yellow	≤ 5.0 mmol/l
Triglycerides	Yellow	≤ 1.5 mmol/l
HDL	Yellow	≥ 1.2 mmol/l
LDL	Yellow	≤ 3.0 mmol/l

## 11. Hormones

Cortisol (nmol/l)	Yellow Preservative-Boric acid if not received in lab within 4hrs post urine collection(10g/L)	Adults: 07h00 – 09h00: 120 – 620 nmol/l 15h00 – 17h00: 85 – 460 nmol/l 24 h urine Cortisol: 80 – 590 nmol/l
Estradiol (pmol/l)	Yellow	
FSH (IU/l)	Yellow	
Free T3	Yellow	3,1 – 6,6 pmol/l
Free T4	Yellow	10,3 – 21,9 pmol/l
LH (IU/l)	Yellow	
Progesterone (nmol/l)	Yellow	
Prolactin (µg/l)	Yellow	
TSH	Yellow	0,35 – 4,5 mIU/l
Testosterone	Yellow	
B-HCG	Yellow	<5 IU/l: Negative
PTH	Purple on ice	1,2 – 8,5 pmol/l
Insulin	Yellow	3,0 – 25,0 mIU/l

## 12. Tumormarkers

AFP	Yellow	0,0 – 8,0 µg/l
CEA (µg/l)	Yellow	Non-smokers: <2,5 Smokers: 2,6 – 10
PSA	Yellow	0,0 – 4,0 µg/l

### 13. CSF investigations

CSF – Protein	Sterile tube	0.15 – 0.45 g/l
CSF – Glucose	Grey tube	2.2 – 3.9 mmol/l
CSF – Chloride	Sterile tube	120 – 130 mmol/l
Blood brain studies:CSF/ IgG Index	Serum/ CSF in a sterile tube	0- 0.70 mg/g
Albumin index		0- 9.0 mg/g
CSF ADA		< 4U/l Normal > 6U/l suggestive of TB meningitis

### 14. Tests on urine and stool

Alpha-1-antitrypsin	Stool		Fill pre-weighed container (from the lab) at the half way mark
Apt test	Bloody stool// vomitus/mucus or blood-stained diaper; collect in glass or plastic container.	Distinguish between fetal and mother's blood	
Amylase (urine)	Urine	0-650 U/l	
Bicarbonate (Tot. CO2-content)	Urine – random	Interpretation depends on serum value	Urine. Fill a 10 ml sterile container. Seal securely. Send immediately on ice
B2 Microglobulin	Urine – random	0-3 ug/L	
Calcium	Urine 24 h	Male 2,5-7,5 mmol/day	
Creatinine Clearance	Urine 24 h Blood gold tube	Male 85-125 ml/min Female 75-115 ml/min	Complete collection required.

Creatinine Clearance	Urine 24 h Blood gold tube	Male 85-125 ml/min Female 75-115 ml/min	Complete collection required.
Copper	Urine-24 h	10- 26 uMol/l	
Fat globules - Sudan staining	Random stool in sterile tube	N: 2.5 fat droplets per high power field Steatorrhea: >26 fat droplets	
Steatocrit	Random stool, not 24 hour. 40 – 50 ml urine container to be used to collect sample.	Adults: 0 – 25%	A minimum of 10g or half a urine container of sample required
5-hydroxy indole acetic acid (5-HIAA)	Urine 24 h or random specimen	Screening: absent	
Homovanilic acid (HVA)	Urine 24 h	> 5 yr 0 – 12 µmol/mmol	Container with 12ml concentrated HCl and 4ml H2O as preservative. Store during collection in a fridge at 4-8°C. Patient must avoid vanilla containing food. Repeat collection on 3 consecutive days
Magnesium	Urine 24 h	3-5 mmol/day	

Fractionated Metanephrines)	Urine 24 h	> 15 yr <5 µmol/24h	Container with 12ml concentrated HCl and 4ml H <sub>2</sub> O as preservative. Store during collection in a fridge at 4-8°C. Patient must avoid vanilla containing food. Repeat collection on 3 consecutive days
Myoglobin	Random urine	Negative	Urine must be fresh and reach the lab within 2 hours after collection
Micro-albumin	Random urine	0 – 20.0 mg/l	
Occult blood	Stool random	Negative	A special diet free of myoglobin and haemoglobin must be followed for 3 days prior to the collection
Osmolality	Random urine – on ice	50-1200 mOsm/ Kg H <sub>2</sub> O – Interpretation depends on serum osmolality	
pH	Random urine	±□6	Send immediately on ice to the laboratory

Porphyrins	Stool (Random)	Screen : Negative	Specimen must be wrapped in dark paper to protect against light.
Porphyrins and precursors: Porphobilinogen (PBG)	10 ml fresh urine	Negative	Specimen must be wrapped in dark paper to protect against light.
Reducing agents	10 ml fresh urine in sterile tube	Absent	
Reducing agents	Stool in sterile tube	Negative	
Specific gravity (SG)	Random urine	Adult: 1.002-1.030	
Tubular reabsorption of phosphate (TRP)	24 h urine	85% - 95%	
TmPO <sub>4</sub> /GFR	24 h urine	Adults 1,0-1,68	
Urea	24 h urine	250 - 500 mmol/day	
Uric acid	24 h urine	1,5-4,4 mmol/day	
Urobilinogen	Random Urine	Absent to trace	

#### 15. Determination on fluids

Pleural fluid Ascites fluid	Exudate: Fluid/ serum protein ratio >0,5 Fluid/serum LD-ratio >0,6 Fluid LD >200 U/l	
Fluid pH		

ADA	Pleural fluid	< 25U/l values >60 suggestive of TB, septic effusion, lymphoma, leukaemia, TB
	Pericardiac fluid	
	Ascitis fluid	
	CSF	< 4U/l / > 6U/l suggestive of TB meningitis

#### 16. Other tests

Homocysteine	EDTA Purple top-on ice	Fasting 2,1 – 15,7 µmol/l Post: 15,0 – 42,2 Homocysteine increase: 8,3 – 27,7
Ferritin	Yellow	10 – 291 g/l
Folate- Red cell	EDTA	280-791 ug/l
Folate- serum	Yellow	Normal: >5.4 ug/l Indeterminate: 3.4 – 5.4 ug/l Deficient; 0.4 – 3.4 ug/l
Vit B12	Yellow	211 – 911 ng/l
Vit D (25 OH)	Yellow	Deficient:<25 nmol/l Insufficiency: 25-75 nmol/l Sufficient; 75 -250 nmol/l Toxicity; >250nmol/l
IgE	Yellow	0,0 - 378 kU/l
Lithium	Yellow	0,5 – 1,2 mmol/l
Amylase (Serum)	Yellow	0-17 U/l
Amylase (urine)	Urine	0-650 U/l
Uric acid	Yellow	0.15-0.35 mmol/l
HbA1c	EDTA (Purple top)	< 6% (N) non-diabetic < 7% Target value > 8% Additional action
Porphyryns	Blood (Heparin tube)	Negative Specimen must be protected against light.
Procalcitonin	Yellow	0.00 – 0.50 ug/L

#### 17. Tests sent to other laboratories

ACTH	5 ml EDTA blood on ice	Send on Ice. Sent to Johannesburg
Acetyl choline receptor antibody	5 ml Clotted Blood	Sent to GSH
ACE (Angiotension Converting Enzyme)	5 ml Clotted Blood	Sent to Johannesburg
Aluminium	10 ml Clotted Blood	Mineral Free Tube. Sent to Johannesburg Avoid antacids containing aluminium
Ca 125	5 ml Clotted Blood	Sent to GSH
Ca 199	5 ml Clotted Blood	Sent to GSH
Ca 153	5 ml Clotted Blood	Sent to GSH
Ca 724	5 ml Clotted Blood	Sent to Johannesburg
Ceruloplasmin	5 ml Clotted Blood	Sent to Johannesburg
Calcitonin	5 ml Clotted Blood	Sent to Johannesburg
C-Peptide	5 ml Clotted Blood	Sent to Johannesburg
DHEAS	5 ml Clotted Blood	Sent to GSH
11 Deoxycortisol	5 ml Clotted	Sent to GSH
DPD	Urine- kept in the dark	Sent to Johannesburg
Gastrin	5 ml Clotted Blood	Sent to Johannesburg
Growth Hormone	5 ml Clotted Blood	Sent to Johannesburg
LEAD	Heparin Blood / Urine	Sent to Johannesburg
Osteocalcin	5ml Clotted blood	Sent to Johannesburg
Selenium	5 ml Clotted Blood	Mineral Free Tube. Sent to Johannesburg
SHBG	5 ml Clotted Blood	Sent to GSH
1.25 Vitamin D	5ml	Sent to Johannesburg
Thiamine	5 ml EDTA	Sent to Johannesburg

## HAEMATOLOGY LABORATORY

The **Discipline of Haematology** is situated on the 9th floor of the hospital. The discipline offers a wide range of routine and specialized investigations to help with the diagnosis and treatment of patients.

### Contact Details

Head of Department: Prof Akin Abayomi

Departmental secretary	021 938-5348 021 938 4608
Consultants	21 938-4399 021 938 6358 021 9384612
Registrars	021 938- / 4613 /4089
Clinical Haematologist	021 938-5888

### Request forms

- Please provide the follow information in legible handwriting
- Patient's name, surname, date of birth and folder number
- Ward number, clinic code, date and time of specimen collection.
- Name of doctor (and initials) to be contacted if abnormal results are obtained
- Relevant clinical information
- Relevant therapy, e.g. warfarin and heparin

### Specimen tube (C9 Core Lab, 5159 / 5074)

All specimens are received here. Urgent FBC's and coagulation tests must be arranged telephonically.

Any results not available on the ward computers may be obtained at the above telephone numbers

### Laboratories

The department is comprised of 5 sections each with different functions

Routine Laboratory	938-5750
Coagulation Laboratory	938-4615
Bone Marrow Laboratory	938-4122
Haemolytic Studies Laboratory	938-4615
Ante Natal Blood Grouping Laboratory	938-6081

## SPECIMEN TYPES

Specimen	Description
EDTA	Purple topped tube (Routine FBC)
Sodium citrate	Light blue topped tube (Coagulation)
Sodium citrate	Black topped tube (ESR)
Clotted blood	Red brown topped tube

If a patient identification sticker is used on a specimen tube, it must be shortened and pasted lengthwise to ensure blood level visibility. Stickers wrapped around the tube will damage the automated cell counter's conveyer belt.

### 1. ROUTINE LABORATORY (C9B CORE LAB, 5750)

Investigation:	Specimen Type:
Full blood count	4ml EDTA blood
Differential WBC count	4ml EDTA blood
Reticulocyte count	4ml EDTA blood
Peripheral blood smear	4ml EDTA blood
<i>(All the above can be done on one 4ml EDTA blood specimen)</i>	
Lamellar body Count	2ml Amniotic fluid (sent in plain tube0)
Erythrocyte Sedimentation Rate (ESR)	2 ml sodium citrate blood (black)

### 2. COAGULATION LABORATORY (CORE LAB, 4615)

Investigation:	Specimen Type:
Clotting profile: INR and PTT	4.5ml sodium citrate
DIC screen: D-dimer	4.5ml sodium citrate
Fibrinogen	4.5ml sodium citrate
Thrombin time,	4.5ml sodium citrate
<i>(All the above can be done on one 4.5ml sodium citrate blood specimen)</i>	

### Investigations for Hypercoagulability

Investigation:	Specimen Type:
Protein C, protein S and Antithrombin	4.5ml sodium citrate
Protein C resistance	4.5ml sodium citrate
<i>(The above four investigations can be done on two 4.5ml sodium citrate blood specimen)</i>	
Factor V Leiden	4ml EDTA blood

### Screening for Lupus Anticoagulant

**4.5ml sodium citrate.**  
*(Investigations for all Hypercoagulability tests are done in batches and not on a daily basis)*

### Investigations for Bleeding Tendency

#### Investigation:

Bleeding time  
Platelet aggregation studies  
Clotting factor levels

#### Specimen Type:

Arrange with laboratory  
Arrange with pathologist  
4.5ml sodium citrate blood.  
Arrange with laboratory.  
4.5ml sodium citrate blood.  
Arrange with laboratory.

**NB: Specimens must reach the Coagulation laboratory within 4 hours of venepuncture.**

### 3. HAEMOLYTIC LABORATORY (CORE LAB, 4615)

#### Investigation:

Direct and indirect Coombs test  
Haptoglobin  
Cold agglutinins and Cryoglobulins

#### Specimen Type:

2ml clotted blood  
2ml clotted blood  
Arrange with the laboratory before 09:00  
Heparin blood (only Mondays to Thursdays) before 12 am.  
Arrange with lab  
4ml EDTA blood  
4ml EDTA blood  
4ml EDTA blood  
4ml EDTA blood

Osmotic fragility 5ml  
G6PD screening test  
Hb electrophoresis  
Sickling Test  
Malaria

### 4. BONE MARROW LABORATORY (C9A, GOLD AVE, ROOM 59, 4122)

#### Bone Marrow Investigations

Done on a daily basis. It comprises a bone marrow aspirate and one or more trephine biopsies. This is a surgical invasive procedure. The patient therefore needs to give written consent for the procedure. Children and adults are usually done under local anaesthetic. Out-patients need to be admitted in the hospital by the duty firm prior to the procedure. Haematology out-patients are admitted via the X-Block.

Premedication must be given one hour prior to the procedure. The ward sister will be informed telephonically of the time that this must be given. An appointment must be arranged with the laboratory. The referring doctor must then consult the relevant pathologist and confirm the appointment. The procedure will only be done if a completed request form (TH333) is received. Referring doctor responsible for:

1. Consent for the procedure
2. Premedication
3. Request form
4. The safe discharge of the patient after the procedure

NAP neutrophil alkaline phosphatase

- Arrange with laboratory – fresh blood from a finger prick is required.

CSF Cytospin

- A fresh, warm CSF specimen kept at 37°C, which is delivered by hand immediately after the lumbar puncture, is required.

Buffy preparation

- 4ml EDTA blood is required. This is done only if WBC count is <4000 per  $\mu$ l or <4 x 10<sup>9</sup>/ $\mu$ l.

Hemosiderin in urine

- Fresh urine specimen in an ordinary urine specimen container.

Flow cytometry for immunological markers

- Arranged by the referring doctor with the pathologist.

### 5. BLOOD GROUPING LABORATORY (C9A, GOLD AVE, ROOM 205, 6081/6082)

#### Investigation:

Ante-natal tests  
Post- Natal tests

#### Specimen type:

4ml EDTA blood  
4ml EDTA maternal blood  
4ml EDTA cord blood  
Arrange with laboratory  
Arrange with laboratory

Cordiocentesis  
Amniocentesis

### 6. AFTER HOURS EMERGENCY INVESTIGATIONS (ROUTINE AND COAGULATION)

Contact the technologist on call via the pager service. Only investigations arranged in this manner will be done after hours. Bleeper 0682.

NOTE: Coagulation specimens must be processed within 6 hours following venepuncture.

The laboratory's tube station is monitored 24 hours a day and specimens can be sent directly to the laboratory (Tube C9)

## MICROBIOLOGY LABORATORY

### Contact Details Medical Microbiology & Immunology:

Laboratory located in the C passage, eastern side of the hospital on the 9th Floor.

Consultant on call: contact pager room at 4487/6666

		Tel. number
Head of Discipline:	Prof. Andrew Whitelaw	4032
Consultants:	Dr. Heidi Orth	4021
	Dr. Rena Hoffman	4008
	Dr. Catherine Samuel	4035
Scientist:	Dr. Kim Hoek	4009
Registrars:	Registrars Office	/5193
Laboratories:	Reception	4012
	Microbiology	4006/7
	Blood cultures	4026
	TB	4031
Head of Immunology	Dr. Monika Esser	5228
	Immunology laboratories	4001/4018

### General Instructions:

1. All diagnostic information from the microbiology laboratory is contingent on the quality of specimen received. Consequences of a poorly collected and/or poorly transported specimen include: i) failure to isolate the causative microorganism, and ii) recovery of contaminants or normal microbial flora which may be misleading and result in improper treatment of the patient.
2. Safety considerations with regard to the handling of specimens:
  - Treat all specimens as potentially hazardous
  - Do not contaminate the external surface of the collection container and/or its accompanying paperwork
  - Minimize direct handling of specimens in transit from the patient to the laboratory. Ideally, specimens should be placed in plastic

3. Please ensure that samples are correctly labelled and that the request form is filled in with all the relevant data.
4. The points listed below each specimen type are to enable clinicians and nursing staff to be able to take a good quality specimen.
5. Please contact the laboratory if in any doubt as to the collection or transport of a specimen.

## 1. FAECAL SPECIMENS - COLLECTION AND TRANSPORT

### SPECIMEN COLLECTION

1. Specimens should be submitted to the laboratory in a sterile screw-cap jar as soon after collection as possible (within 1 - 2 hours). Ensure that the specimen is not contaminated with urine.
2. Sample portions containing pus, blood or mucus when submitting a specimen. A tablespoon-sized quantity is sufficient for bacteriological processing.
3. The most important requirement is a freshly passed stool specimen, since acid metabolites in stored specimens may be detrimental to enteropathogenic bacteria.
4. Stool specimens in transport medium: A small amount of stool can be collected by inserting a sterile cotton swab into the stool and rotating it. If mucus is present, it should be sampled. Immediately insert swab into the transport medium (e.g. Cary-Blair, Amies' or Stuart's transport medium). Push swab completely to the bottom of the tube of transport medium and the top portion of the stick touching the fingers, may be broken off and discarded. Recap and tighten firmly.
5. Rectal swabs: may be submitted where stool cannot be obtained eg. in neonates or severely debilitated adults or when screening for carriage is required. Moisten the swab in sterile transport medium, insert swab gently through the rectal sphincter, 2-3cm, rotate to sample anal crypts. Remove swab and check for visible faecal material. Place in suitable transport medium and deliver to laboratory promptly Place the tube in a refrigerator or cold box if delay in transport.
6. Biopsy: specimens of bowel wall tissue e.g. colon. Routine MC&S is not recommended as these tissue samples are considered unsterile and the organisms predominately cultured are considered colonizers of the gastrointestinal tract. TB culture is recommended, if clinically suspected. Submit tissue specimens in a sterile screw-cap jar with a small amount of sterile water/normal saline to prevent desiccation.

Specimens for microbiological processing must not be submitted in formalin.

7. Clostridium difficile toxin assay: patients suspected of antibiotic-associated diarrhoea should have stool submitted for C. difficile toxin assay. The request must be clearly indicated on the form. Stools samples must be freshly collected and kept refrigerated or on ice.
8. Parasites: If parasites are suspected, request testing for parasites
9. A modified acid-fast stain is performed to identify Cryptosporidium parvum. It is routinely done on all unconcentrated stool specimens of children < 3yrs and on specimens from immunocompromised patients if this information is available on the request form.

#### Specimens of doubtful value:

1. Unpreserved stool samples >2 hours old.
2. Dry rectal swabs or biopsy samples.
3. Multiple specimen collections on the same day.

Please note: Routine MC&S includes microscopy of a wet mount preparation, culture for Salmonella, Shigella and Campylobacter and sensitivity testing. The wet mount preparation is examined for red and white blood cells and parasites. If Vibrio cholera or E. coli 0157.H7 (haemolytic uremic syndrome) is suspected, please indicate so on the request form.

## 2. URINE SPECIMENS - COLLECTION AND TRANSPORT

Urine is normally a sterile body fluid. If not, collected properly, it can become contaminated with normal flora of the perineum, urethra or vagina. The following guidelines are provided to ensure proper specimen collection and subsequent, prompt, delivery of urine samples to the laboratory.

#### TIMING OF SPECIMEN COLLECTION

1. Obtain early-morning specimens whenever possible because of increased bacterial counts after overnight incubation in the bladder.
2. Do not force fluids in order to have the patient void urine. Excessive fluid intake will dilute the urine and may decrease the colony count to <105 CFUs/ml.
3. For Schistosoma haematobium (Bilharzia), send 3 terminal urine specimens for detection of ova.

#### SPECIMEN TRANSPORT

1. Transport urine to the laboratory as soon as possible after collection.
2. Urine specimens must be submitted for culture within 2 hours after collection, or refrigerated and cultured within 24 hours whenever possible.

**All specimen containers must be tightly closed to prevent leakage. If sample has grossly leaked from the container, the specimen will be rejected for processing. Please indicate on the request form: the mode of specimen collection (eg. MSU, etc), date, time and clinical diagnosis.**

Please note that urine samples obtained by suprapubic aspiration and at cystoscopy are processed differently in the laboratory compared to conventional MSU samples and it is therefore essential, so as to not compromise the accuracy of results, to inform the laboratory about the mode of specimen collection.

#### SPECIMEN COLLECTION

##### MIDSTREAM URINE SPECIMENS (MSU):

1. Wash hands with soap and water, rinse, and dry. If the patient is collecting the specimen, provide detailed instructions, including diagrams or a pictorial display.  
**Females:** Cleanse the urethral opening and vaginal vestibule area with sterile gauze pads soaked with normal saline or sterile water. Do not use disinfectants. Hold the labia apart during voiding.  
**Males:** Cleanse the penis, retract the foreskin (if not circumcised), and wash with normal saline. Keep foreskin retracted while voiding (to minimise contamination with skin flora).
2. **Both females and males:** Allow a few millilitres of urine to pass into the toilet (DO NOT STOP THE FLOW OF URINE) collect the midstream portion of urine in a wide-mouthed sterile container.
3. DO NOT use a urinal or bedpan for collection.

#### CATHETER URINE

1. Indwelling urinary catheter specimens are the most unsatisfactory of all urine specimens, because these catheters are often colonized and therefore bacterial cultures are difficult to interpret. Remove catheter if catheter-associated urinary tract infection is suspected and collect a MSU or if a catheter is still required, collect the urine specimen after replacement of the catheter.
2. Do not collect the sample from the drainage/collection bag
3. Collect sample from the sampling port with a syringe and needle using an aseptic technique.  
Clamp catheter tubing below port  
Clean sampling port with at least 2 separate 70% alcohol swabs  
Insert needle obliquely into port and aspirate urine.



Transfer to sterile container and mark correctly: "indwelling catheter urine specimen".

4. A straight (non-indwelling) catheter can be used by a physician to obtain urine directly from the bladder. This procedure is not routinely recommended because there is a risk of introducing microorganisms into the bladder. It should be performed aseptically if necessary.
5. Urine from an ileal conduit must be collected after removal of the external device and insertion of a catheter into the cleansed stoma.
6. Urine collected by suprapubic needle aspiration of the bladder avoids contamination associated with the collection of voided urine. This is the preferred method for infants and for patients for whom the interpretation of results of voided urine is difficult.
7. Foley catheter tips are **UNACCEPTABLE samples** for culture.

### 3. STERILE BODY FLUIDS INCLUDING CSF - COLLECTION AND TRANSPORT

#### CEREBROSPINAL FLUID (CSF)

**Please note: CSF MUST BE COLLECTED PRIOR TO ANTIMICROBIAL THERAPY!**

Collection considerations for Cerebral Nervous System (CNS) specimens:

Culture	Optimal volume (ml) <sup>a</sup>	Comments
Bacteria	1	Send cloudiest CSF specimen to microbiology laboratory immediately.
Fungi	5 - 10	Culture for <i>Cryptococcus</i> spp. is more sensitive if a higher volume of CSF is processed
Mycobacteria	5-10	<i>Mycobacterium tuberculosis</i> , <i>Mycobacterium avium- intracellulare</i> complex.
Anaerobes	NA	Brain abscess pus or central nervous system (CNS) biopsy specimens.
<sup>a</sup> Amounts are guidelines. Greater volumes increase the chance of organism recovery. NA, not applicable.		

- Sterile tubes without clot activator Material aspirated from a brain abscess should be immediately transported to the laboratory
- CSF specimens should be transported to the laboratory promptly. Failure to do this may result in the non-viability of fastidious organisms and in overgrowth by more hardy bacteria.
- If prompt delivery is not possible specimens should be kept at room temperature, but never refrigerated. Organisms such as *Neisseria meningitidis* and *Haemophilus influenzae* are sensitive to chilling.

Routine examination of CSF involves:

- Direct cell count
- Gram stain
- India ink stain (for *Cryptococcus*)
- Culture (Bacteria and *Cryptococcus*)
- Sensitivity testing on bacteria cultured
- Other investigations: TB culture, Cryptococcal antigen test

INTERPRETATION OF CSF RESULTS:

Condition	Macroscopic appearance	Cell count (per mm <sup>3</sup> )	Erythrocytes	Protein (g/l)	Glucose (mmol/l)
Normal	Clear	0-5 lymphocytes (0 – 30 cells in neonate, mainly neutrophils)	None	0.15 – 0.4 (0.15 – 1.5 in neonate)	2.2-3.3 (60% of blood glucose)
Bacterial meningitis	Turbid	100-2000 neutrophils	None	0.5 – 3 ↑↑	0 – 2.2 ↓
Viral meningitis	Clear or slightly turbid	15 – 500 lymphocytes	None	0.5 – 1 ↑	Normal
Tuberculous meningitis/ <i>Cryptococcus</i> *	Clear or slightly turbid	30 – 500 lymphocytes plus neutrophils	None	1 – 6 ↑↑↑	0 – 2.2 ↓
Bloody tap or recent haemorrhage	Bloody or xanthochromic	Variable	High	↑ due to blood	Normal

\*All parameters may be completely normal in the severely immunocompromised patient with Cryptococcal meningitis

## OTHER STERILE FLUIDS

### Commonly submitted fluids

1. Joint or synovial fluid
2. Pleural fluid
  - a. Thoracocentesis fluid
  - b. Empyema fluid
3. Peritoneal fluid
  - a. Ascites fluid
  - b. Paracentesis fluid
3. Pericardial fluid
4. Culdocentesis fluid

## SPECIMEN COLLECTION

1. Specimens should be collected with as little contamination from indigenous microbial flora as possible to ensure that the sample will be representative of the infected site.
2. Sterile equipment and aseptic technique must be used to collect specimens to prevent introduction of microorganisms during invasive procedures.
3. If a specimen is to be collected through intact skin, cleanse the skin first. For example, use 70% alcohol followed by 0.5% chlorhexidine in alcohol and wait till dry.
4. In addition to routine information it is essential that the patients' specimen label accurately reflects:
  - The specific body site from which the specimen was taken
  - Provisional diagnosis
5. Collect specimens in sturdy, sterile, screw-cap, leak-proof containers with lids that do not create an aerosol when opened.
6. Although occasionally small clots will form in some fluids, addition of anticoagulant is not recommended; citrate or EDTA inhibits some organisms. If anticoagulant must be used, heparin should be the choice.
7. Although in the past the use of blood bottles for fluid collection has not been recommended, recent studies suggest that the larger the sample volume that can be cultured the more likely the recovery of low numbers of organisms in fluids such as ascitic fluid will be. As with any broth system, however, the fastest growing organism is often the only one isolated, jeopardizing the recovery of slow growers.

When a broth is used, no direct smear information is available and, therefore,

no assessment of the initial distribution of organisms or inflammatory cells can be made. A smear can be prepared, however, at the time of specimen collection and submitted with the broth medium.

## TRANSPORT

### Syringes:

Specimens obtained by a doctor using needle aspiration should be transferred to a sterile container prior to transport to the laboratory. Alternatively, and only if transferring it from the syringe will compromise the specimen, the **doctor should remove the needle**, using a protective device to avoid injury, and cap the syringe with a sterile cap prior to transporting it to the laboratory. It is essential that the specimen be submitted to the laboratory immediately after collection.

### Swabs:

Swabs are the least desirable sample for culture of body fluids and their use should be discouraged. Protection of anaerobes from ambient oxygen is impossible. A good direct smear cannot be made, and the quantity of sample may not be sufficient to ensure recovery of a small number of organisms. If a swab is taken it is essential that it be placed in an anaerobic transport medium.

## 4. BLOOD CULTURES - COLLECTION AND TRANSPORT

We recommend that a minimum of 2 aerobic blood cultures from different sites should be submitted in order to acquire the optimal volume of blood and to facilitate the interpretation of results.

Anaerobic blood culture bottles are not available routinely. Most infections involving anaerobes are clinically suspected e.g. intra-abdominal infections. Management of anaerobic infections involves surgical debridement and drainage in addition to antimicrobial therapy. A recent survey in the Western Cape has shown that the beta-lactam inhibitor combination drugs (co-amoxiclav and piperacillin-tazobactam), carbapenems, including ertapenem, and metronidazole remain very active against anaerobic organisms and are suitable agents for empiric therapy where anaerobic cover is needed.

## A. PROCEDURE

### Site selection

The phlebotomist should:

- Select a different site for each blood sample.
- Avoid drawing blood through indwelling intravenous or intra-arterial catheters. However if blood cultures have been obtained from intravascular catheters, they should be labelled as such and a blood

culture should also be obtained by venipuncture at the same time in order to help assess positive blood cultures from catheters.

#### Site preparation

- Vigorously cleanse the venipuncture site with 70% isopropyl or ethyl alcohol and wait till dry.
- Apply 0.5% chlorhexidine in alcohol disinfectant in ever increasing circles starting at the point where the venipuncture is to be made and allow to dry..
- Do not touch the venipuncture site after preparation and prior to phlebotomy.

#### Disinfecting blood culture bottles

- Disinfect the top of the bottle or tube with alcohol and allow top to dry.

#### Collection of blood

- Using a syringe and needle insert the needle into the vein, and withdraw blood. Do not change needles before injecting the blood into the culture bottle due to risk of needlestick injury.
- After the blood is inserted into the blood culture system mix well to avoid clotting.
- Use a new needle if vein is missed initially.
- Add sufficient volume of blood according to the table below.

### B. SPECIMEN VOLUME

**Note:** The volume of blood is critical because the number of organisms in the majority of bacteraemias is low, especially if the patient is on antimicrobial therapy. Collection of an appropriate volume of blood improves the time to detection and the yield. In infants and children, the number of microorganisms during bacteraemia is higher than in adults. Therefore less blood is required for culture.

#### Recommended volume per bottle: see label on bottle

Children: Ideally, 3 to 5ml of blood should be added to bottle

Neonates: 1-3ml of blood per bottle

Adults: Ideally 10ml blood per culture bottle (aerobic).

### C. RECOMMENDATION ON NUMBER AND TIMING OF BLOOD CULTURES

- a. A minimum of 20ml (blood cultures from different sites) is recommended in order to obtain an optimal yield from blood

cultures.

- b. Fever of unknown origin (occult abscess, typhoid fever, or brucellosis): Obtain two separate blood cultures initially. It is recommended that a further 2 blood cultures be obtained during temperature spike ideally after 24-36 hours of the initial samples. The increase in positive cultures beyond four cultures is very minimal.
- c. Suspected endocarditis – collection of blood cultures do not have to coincide with fever spikes due to continuous bacteraemia.

### D. BOTTLE TYPES:

BOTTLE	USE	BLOOD VOLUME
<b>BacTAlert® SA</b> Standard Aerobic Culture Bottles <b>(Blue caps) – available in wards</b>	These bottles are generally used in most of the bacteraemia, candidaemia and cryptococcaemia cases	The optimal blood volume per bottle for culture is 8-10ml.
<b>BacTAlert® PF</b> Paediatric Culture Bottles <b>(Yellow caps) – available in the wards</b>	These bottles are aerobic and are used for low volume specimens; such as in neonates	The optimal blood volume per bottle for culture is 4ml (filling volume ranges from 0.5-4ml)
<b>BacTAlert® FA</b> Resin (charcoal) containing Aerobic Culture Bottles <b>(Green caps) – available in the wards</b>	The resin bottles absorb antibiotics and the inhibiting components out of the blood; enhancing the recovery of micro-organisms.	The optimal blood volume per bottle for culture is 8-10ml.
Bactec Myco/F lytic <b>(Red cap)</b> or BacT/Alert® MB <b>(Black cap)</b> – obtainable from core lab reception	These bottles are generally used in cases of disseminated TB; M. avium-intracellulare The medium will also support growth of other organisms, including yeasts, fungi and bacteria.	The optimal blood volume per bottle for culture is 3-5ml.

Duration of incubation of blood cultures is 5 days; using an automated system. Please indicate if endocarditis is suspected, because some organisms that cause endocarditis e.g. HACEK group are slow-growing and therefore these bottles need to be incubated for 14 days Suspected Brucella is incubated for 28 days and suspected TB and fungi other than Candida/Cryptococcus (Bactec Myco/F lytic bottles) are incubated for 42 days, before the culture is regarded as negative.

#### E. QUALITY CONTROL:

##### Media

- Check expiry dates of each batch of blood culture bottles used.
- Uninoculated blood culture bottles should be stored in a cool dark place
- Examine bottles for turbidity and/or change of colour before adding any blood.
- Discard any bottles showing abnormal characteristics.

##### Labelling and transport

Please ensure that all blood culture bottles are labelled correctly (not over bar code and not over the bottom of the bottle that contains the sensor (the machine reads this sensor). Do not remove any barcode numbers from the label on the bottle. The laboratory request form must be completed with all the relevant required data. All specimens should be transported to the laboratory promptly. Failure to do this may result in the death of fastidious organisms and in overgrowth by more hardy bacteria.

##### INTRAVASCULAR CATHETER TIP CULTURES

Cleanse skin around catheter site with alcohol.

Aseptically remove catheter, and slip 5cm distal tip of catheter directly into sterile tube.

Transport directly to microbiology laboratory to prevent drying.

Acceptable IV catheters for culture: central, CVP, Hickman, Broviac, peripheral, arterial, umbilical, hyperalimentation, Swan-Ganz.

#### 5. PUS SWABS INCLUDING BURN SWABS – COLLECTION AND TRANSPORT

##### SPECIMENS

**Specimens should be collected prior to the administration of antimicrobial therapy. The quality of the specimen is very important in order to isolate the causative pathogen(s) and not colonizing flora or contaminants.**

#### A. SUPERFICIAL WOUNDS:

##### Aspirates:

- a. Syringe aspirates (3- 5 ml syringe with 22- 23 gauge needle) are preferable to swab specimens.
- b. Decontaminate the surface of the wound with a **chlorhexidine/ alcohol** solution The deepest part of the lesion should be **aspirated**. **If a vesicle** is present, collect both fluid and cells from the base of the lesion.
- c. If the initial aspiration fails to obtain material, inject sterile, non-bacteriostatic 0.85% NaCl subcutaneously and repeat the aspiration.
- d. Transfer the aspirate into a sterile container and transport promptly to the laboratory. If a delay in processing of more than 30 minutes is anticipated, the specimen should be transferred to an anaerobic transport container.

##### Pus swabs:

If material cannot be obtained with a needle and a syringe, and a swab must be used.

- a. Separate the wound margins with the thumb and forefinger of one hand (wearing a sterile glove) and take a deep swab or make a small opening in a closed abscess with a scalpel blade before extending the tip of the swab deeply into the depths of the lesion with the other hand. Care should be taken not to touch the adjacent skin margins.
- b. The swab should then be inoculated onto appropriate culture media as soon as possible after collection; alternatively, it can be placed immediately into a suitable transport medium (eg. Amies or Stuart's medium). **Dry swabs are not recommended.**

#### B. ULCERS AND NODULES:

- a. Clean the area with 70% alcohol and then a 0.5% chlorhexidine in 70% alcohol - solution.
- b. Remove overlying debris.
- c. Curette the base of the ulcer or nodule.
- d. If exudate is present from the ulcer or nodule, collect it with a syringe or a sterile swab.

#### C. BURN SPECIMENS:

The surfaces of burn wounds will become colonised by the patient's own microbial flora or by environmental organisms. When the organism load is large, infection of underlying tissue may occur, and bacteraemia may ensue. Cultures of the surface alone are misleading; therefore biopsies of deeper tissues after debridement are often indicated. Clean the surface of the wound with normal

saline/ sterile water before collecting samples. Blood cultures should be taken if septicaemia is suspected.

#### **D. DEEP WOUNDS, ASPIRATES, AND TISSUE SPECIMENS:**

##### **a. Bite wounds:**

Aspirate pus from the wound, or obtain at the time of incision, drainage, or debridement of the infected wound.

##### **b. Bone:**

Obtain bone specimen during surgery. Submit a sterile container without formalin. Specimen may be kept moist with sterile 0.85% NaCl.

##### **c. Deep wounds or abscesses:**

Disinfect the surface with 70% alcohol and then with a chlorhexidine solution. Aspirate the deepest portion of the lesion, avoiding contamination by the wound surface. If collection performed at surgery, a portion of the abscess wall may also be sent for culture.

##### **d. Punch skin biopsies:**

Disinfect the skin surface with 70% alcohol and then with a chlorhexidine solution. Collect a 3-4mm sample with a dermal punch. Submit for microbiological analysis in a sterile container without formalin.

##### **e. Soft tissue aspirate:**

Disinfect the surface with 70% alcohol and then with a chlorhexidine solution. Aspirate the deepest portion of the lesion or sinus tract. Be careful to avoid contamination by the wound surface.

#### **Colonic and rectal biopsies:**

These tissue samples are considered unsterile and the organisms predominately cultured are considered colonizers of the gastrointestinal tract. Routine MC&S not routinely recommended. The exception where biopsy is considered useful is in TB, *Helicobacter* and *Campylobacter* sp. Infections.

##### **f. Throat (Pharyngeal specimens):**

1. Routinely used for the isolation of Group A Streptococci. Please stipulate on the request form if suspicious of any other pathogens eg. *Neisseria gonorrhoeae*. Staphylococci may cause tonsillar abscesses – please send pus for culture. If diphtheria is suspected, a sample of

the pseudomembrane should be collected.

2. Do not obtain throat samples if epiglottitis is inflamed, as sampling may cause serious respiratory obstruction.
3. Depress tongue gently with tongue depressor.
4. Extend sterile swab between the tonsillar pillars and behind the uvula. (Avoid touching the cheeks, tongue, uvula, or lips).
5. Sweep the swab back and forth across the posterior pharynx, tonsillar areas, and any inflamed or ulcerated areas to obtain sample..

##### **g. Nasal swabs:**

- Submitted primarily for the detection of staphylococcal carriers.
- After moistening the swab with sterile water or saline, insert the swab into the nose until resistance is met at a level of the turbinates (2cm).
- Rotate the swab against the nasal mucosa.
- Repeat the process on the other side with the same swab. Nasal swabs are not suitable for the detection of the aetiologic agents of sinusitis. A needle aspirate of the sinus is the specimen of choice.

##### **h. Swabs for the culture of *B. pertussis*:**

Contact the laboratory to obtain special agar medium (charcoal-cephalexin plates) and "calcium-alginate" swabs for the collection of pernasal specimens.

- a. Insert swab into nasal passage, aiming towards the midline and down. Follow the floor of the nasal passage for ~5 cm (depending on the age of the patient) until progress is blocked by the posterior wall of the nasopharynx.
- b. Take > 1 swab on consecutive days for optimal results.
- c. Plates are incubated for 7 days.
- d. Alternative: nasopharyngeal aspirate. Please note that the PCR test for the detection of *B. pertussis* is referred to GSH microbiology laboratory. Send nasopharyngeal aspirate and specifically request Pertussis PCR.

Other upper respiratory tract specimens that may be submitted to the laboratory include sinus aspirates and tympanocentesis fluid.

#### **E. GENERAL RECOMMENDATIONS FOR SPECIMEN COLLECTION FOR SEXUALLY TRANSMITTED DISEASES:**

##### **Cervical swabs**

The cervix should be visualized via speculum examination and normal or inflammatory discharges should be removed with swabs. For chlamydia and gonorrhoea, the collection swab should be inserted 2-3cm into the endocervical

canal and rotated against the walls of the canal to dislodge columnar epithelial cells. The swab is rolled onto a slide for microscopic examination or placed into appropriate transport/storage medium (Amies transport medium for GC and Chlamydial transport medium) for the subsequent diagnostic test required. Please note that **vaginal swabs** are not suitable for the isolation of *Neisseria gonorrhoea* and *Chlamydia* antigen detection.

#### **Rectal swabs**

Insert the swab 2-3cm into the anal canal, press laterally then rotate to obtain columnar epithelial cells with minimal faecal contamination. Process as for cervical swabs.

#### **Urethral swabs**

A thin cotton or Dacron swab on a wire shaft is inserted 2-4cm into the urethra, rotated and used to prepare smears for microscopic examination or placed into appropriate transport media.

#### **Eye specimens**

Conjunctival scrapings (using spatula or no. 15 blade scalpel without touching lashes or lids) or sterile swab to sample the discharge or lower conjunctival surface. Two swabs are preferred (one for Gram stain and one for culture.) Inoculate directly onto blood agar, chocolate agar or put in appropriate transport media. If gonococcal conjunctivitis is suspected, send specimen in Amies transport medium.

#### **Ear swab cultures**

Ear swabs are only useful for isolation of pathogens causing otitis externa. The flora of the external meatus bears no relation to that behind the eardrum. Ear swabs are taken from just inside the external meatus. The most common pathogens are *S. aureus* and *Pseudomonas aeruginosa*. Most cases respond to keeping the ear clean and dry. For the isolation of pathogens causing otitis media, fluid from behind the eardrum should be aspirated for culture.

#### **TRANSPORT**

- a. All specimens should be transported to the laboratory promptly. Failure to do this may result in the death of fastidious organisms and in overgrowth by more hardy bacteria.
- b. If prompt delivery is not possible specimens should be refrigerated at 4-8°C
- c. Syringes:  
Specimens obtained by a doctor using needle aspiration should be transferred to a sterile tube to transport to the laboratory.

Alternatively, and only if transferring it from the syringe will compromise the specimen, the doctor should remove the needle, using a protective device to avoid injury, and cap the syringe with a sterile cap prior to transporting it to the laboratory. It is essential that the specimen be submitted to the laboratory immediately after collection.

#### **ANAEROBIC CULTURES**

A foul smelling discharge may indicate anaerobic infection.

Most anaerobes are susceptible to amoxicillin-clavulanate (Augmentin), and metronidazole. No disk sensitivity testing is performed on anaerobes, but the report will indicate whether an anaerobe produces beta-lactamases (indicating resistance to penicillins).

Aspirated pus for anaerobic culture can be sent in a syringe (needle removed) or sterile tube, and tissue in a sterile container with or without sterile saline.

IUCDs (intra-uterine contraceptive devices) can be sent in a sterile container for culture of Actinomycetes.

Pus swabs are not acceptable for anaerobic cultures except when sent in anaerobic transport medium. These specimens SHOULD NOT be refrigerated.

#### **6. COLLECTION AND TRANSPORT OF SPECIMENS FOR FUNGAL CULTURE**

##### **SKIN**

Epidermal scales are collected by scraping the affected areas with a blunt, banana shaped scalpel. Material from the active periphery of lesions is taken for examination. In paronychia infections, the nail fold should be moistened with sterile water and a dental probe used to remove material from under the nail fold. Roofs of vesicles are snipped off with sterile scissors for examination. It is not necessary to pre clean skin with 70% ethanol unless ointments or other topical medications have been recently applied.

##### **NAIL**

Whole thickness of affected nails is clipped off using nail clippers. Subungual debris is scraped out with a blunt scalpel or dental probe and often contains much fungus.

##### **HAIR**

Scalp and other hair-bearing areas should be examined under a Wood's

lamp. Fluorescent hairs (bright green in *Microsporum* infections, dull green in *T. schoenleinii* (favus) infection or hair stumps should be plucked out with sterile forceps. If no fluorescence is noted, lustreless hairs or stumps of hairs broken off at follicular level should be plucked out.

Skin scrapings should also be taken from suspect areas (hair stumps are often extracted by this method). Scalp samples (especially for mass screening) can be obtained using individually bagged plastic massage brushes, velvet squares or even swabs.

#### **TRANSPORT**

Specimens should be sent DRY in specimen jars to prevent overgrowth of contaminating fungi. Spores of fungi in these specimens will remain for many weeks to several years when maintained in a dry condition.

#### **SUBCUTANEOUS FUNGAL LESIONS**

Send biopsy tissue or aspirated pus in sterile container.

#### **SPUTUM, BRONCHIAL WASHINGS, TRANSTRACHEAL ASPIRATES etc**

Collect into sterile containers and transport to the laboratory without delay. Refrigeration will kill the yeasts of *Histoplasma capsulatum* rapidly, therefore this is not advised when histoplasmosis is suspected.

#### **BONE MARROW**

Bone marrow should be aspirated into Myco/F lytic blood culture bottles for fungal culture

### **7. INFECTIONS OF THE RESPIRATORY TRACT**

**PHARYNGITIS, PERTUSSIS AND LARYNGITIS** - see pus swab section

#### **EPIGLOTTITIS**

Culture of the throat is not indicated. Touching the inflamed epiglottis may precipitate complete obstruction of the airway

#### **SINUSITIS**

The specimen of choice is a needle aspirate of the sinuses. Do not submit a swab. No specimen other than an aspirate is recommended

#### **SPUTUM AND LOWER RESPIRATORY TRACT - COLLECTION AND TRANSPORT**

##### **INTRODUCTION:**

Infections of the lower respiratory tract are a major cause of morbidity and

mortality. Diagnosis of these infections frequently is complicated by the contamination of specimens with upper respiratory tract secretions during collection. Specimen quality is judged microscopically. A properly collected specimen should contain minimal numbers of squamous epithelial cells and significant numbers of neutrophils with bacterial infection.

Please note: Legionella antigen test on urine is available at the NHLS microbiology laboratory at GSH.

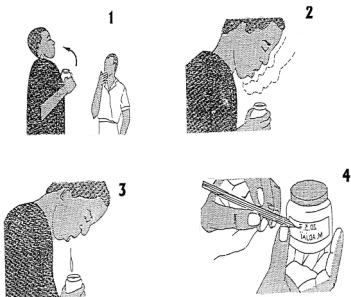
##### **SPECIMEN COLLECTION:**

Specimens include sputum, endotracheal aspirates, bronchial washings, bronchial brushes, bronchial biopsy specimens, bronchoalveolar lavage fluid, transtracheal aspirate, lung aspirates and lung biopsy specimens.

- It is best to obtain a sputum specimen early in the morning, before the patient has eaten or taken medication.
- Collecting a good sputum specimen is not easy and requires that the patient be given clear instructions and explanation of the difference between sputum and saliva/spit.
- It is important to remember that aerosols containing TB bacteria may be produced when the patient produces a sputum specimen.
- It is best for the patient to produce a specimen either outside in the open air or away from other people.
- Patients should not produce sputum in confined spaces such as toilets.
- The person supervising the sputum collection should stand behind the patient to avoid breathing in any aerosols that may be created when the patient coughs.

##### **THE FOLLOWING INSTRUCTIONS SHOULD BE GIVEN TO THE PATIENT, WHEN COLLECTING SPUTUM SAMPLES:**

1. The patient should rinse his/her mouth with water, then take two deep breaths, holding the breath for a few seconds after each inhalation and then exhaling slowly.
2. The patient should hold the specimen container to the lower lip and gently release the specimen from the mouth directly into the container and avoid spills.
3. The specimen container is then capped and clearly labelled.
4. The specimens should be transported to the laboratory as soon as possible after collection. **DO NOT FREEZE SPECIMENS!**



**PROCEDURE FOR INDUCTION OF SPUTUM for the isolation of *Pneumocystis jirovecii*:**

1. Patient should preferably not have eaten for 8 hours.
2. Patient should brush teeth with water, rinse thoroughly and gargle several times.
3. Patient inhales 20-30 ml of hypertonic saline (3-5%) in a fine mist generated by an ultrasonic nebuliser over 10-20 minutes.
4. Patient is encouraged to take several deep breaths and cough deeply.
5. Collect sputum in sterile containers.
6. Sputum collected initially should be sent for TB and AFB, fungal culture and MC&S.
7. Later specimens are more likely to be representative of distal respiratory tract secretions and should be sent for *Pneumocystis jirovecii* examination.
8. An indirect immunofluorescence test is done – see serology

**GUIDELINES FOR PROPER SPECIMEN TRANSPORT**

All specimens should be transported to the laboratory promptly. Failure to do this may result in the death of fastidious organisms and in overgrowth by more hardy bacteria. If prompt delivery is not possible specimens should be refrigerated at 4-8OC.

**TB LABORATORY**

**Phone number: 938 4031**

Proper collection procedures are imperative for accurate laboratory analysis. The quality of specimens collected and the proper transport of those specimens to the laboratory are critical to successful isolation of etiological agents.

**General guidelines for specimen collection for TB analysis:**

- a. Use only sterile, screw cap, leak proof, disposable plastic containers for specimen collection.
- b. Do not use waxed containers as they may produce false-positive smear results.
- c. Label the container with the patient's name, specimen type and date and time of collection.
- d. Collect initial specimens before anti-tuberculous medication is started.
- e. Swabs are not recommended for the isolation of mycobacteria.
- f. Collect sufficient material for the tests requested (see table below)
- g. Do not use any fixatives or preservatives
  - o The specimen should be transported to the lab as soon as possible after collection. If this is not possible, the specimens should be refrigerated to inhibit the growth of unwanted micro-organisms.
- h. **Do not freeze specimens.**
  - o Mycobacteria are killed by ultraviolet light, therefore specimens should not be placed anywhere where they may be exposed to direct sunlight or become too hot.

**TB Diagnostics::**

Current national and provincial policy suggests a **single GeneXpert (GXP)** analysis on a respiratory sample (sputum, induced sputum and tracheal aspirate) from an adult TB suspect to screen for TB and to detect resistance to Rifampicin. When performed, the GXP will replace smear microscopy. The GXP diagnostic algorithm should be used when interpreting the result and to decide on further action.

General principles:

- If the GXP result is positive and suggests a **rifampicin susceptible** isolate, a 2nd sample should be sent for microscopy
- If the GXP result is positive and suggests the presence of a **rifampicin resistant** isolate, a 2nd sample should be sent for TB culture and subsequently processed by Hain line probe assay and second-line drug



- susceptibility testing (DST) will be performed
- If the GXP result is indeterminate a 2nd specimen should be submitted for **TB microscopy and culture** (preferably before the patient is commenced on anti-TB therapy)
- If the GXP result is negative, submit a 2nd specimen for culture ± DST in HIV-infected patients

Please note:

**Guidelines for using the GXP on paediatric samples or extrapulmonary samples from adults and children are not yet available and is thus not routinely performed. These samples will be processed for TB microscopy, culture and sensitivity as requested.**

The GXP is able to identify rifampicin-resistant strains but is currently unable to identify INH-mono-resistant TB strains; this is currently done by the Hain line probe assay.

Acid-fast microscopy is performed on respiratory specimens where TB microscopy is requested for monitoring treatment

If the sample volume is insufficient for GXP, culture ± DST will be performed.

If the sample is highly blood-stained or the consistency of the sample is not suitable for a GXP, culture ± DST will be performed.

If the sample volume is insufficient for culture, acid-fast microscopy will be performed

**Please note: the laboratory will not process leaking specimens!**

Table: Specimen requirements for mycobacterial isolation and acid-fast stains

SPECIMEN TYPE	SPECIMEN REQUIREMENTS	SPECIMEN INSTRUCTIONS	UNACCEPTABLE SPECIMENS
Abscess contents, aspirated fluid	As much as possible in sterile container	Cleanse skin with alcohol before aspirating sample. Collect sample on swab, and place in transport medium only if volume is insufficient for aspiration by needle and syringe.	Dry swab
Blood	5ml inoculated directly into BACTEC Myco-F-lytic bottle	Disinfect site as for routine blood culture. Mix tube contents immediately after collection.	Blood collected in EDTA, Citrate, Oxalate or fluoride tubes – these inhibit mycobacterial growth even in trace amounts
Body fluids (pleural, pericardial, peritoneal etc.)	As much as possible (10-15 ml minimum) in sterile container.	Disinfect site with alcohol if collecting by needle and syringe.	
Bone	Bone in sterile container without fixative or preservative		Specimen submitted in formalin
Bone marrow	As much as possible in BACTEC Myco-F-lytic bottle	Collect aseptically. Mix tube contents immediately following collection.	
Broncho-alveolar lavage or bronchial washings	≥ 5ml in sterile container	Avoid contaminating bronchoscope with tap water. Saprophytic mycobacteria may produce false-positive culture or smear results.	

Bronchial brushing	Sterile container		
CSF	≥ 5-10ml in sterile container	Use maximum volume attainable	
Fine needle aspirate	Submit dry, unfixed slide and aspirate in a sterile container or directly inoculated not more than 0.5ml into a MGIT tube (available from Microbiology and the Cytology clinic)	Make smear of aspirate on a clean dry slide. Air dry. Do not use any fixative.	Slide sprayed with fixative
Gastric lavage fluid	≥ 5-10ml in sterile container. Collect in the morning soon after patient awakens in order to obtain sputum swallowed during sleep.	Collect fasting early-morning specimen on 3 consecutive days. Use sterile saline. Adjust to neutral pH with 100mg of sodium carbonate immediately following collection.	Specimen that has not been pH-neutralised
Lymph node	Node or portion in sterile container without fixative or preservative	Collect aseptically. Select caseous portion if available. Do not immerse in saline or other fluid and do not wrap in gauze	Specimen submitted in formalin

Skin lesion material	Submit biopsy specimen in sterile container without fixative or preservative. Submit aspirate in sterile container.	Swabs in transport medium (Amies or Stuarts) are acceptable only if biopsy sample or aspirate is not obtainable. For cutaneous ulcer, collect biopsy sample from periphery of lesion, or aspirate material from under margin of lesion.	Dry swab
Sputum	5-10ml in sterile, wax-free, disposable container. Collect an early morning specimen from deep, productive cough on at least 2 consecutive days. Do not pool specimens.	For expectorated sputum, instruct patient on how to produce sputum specimen as distinct from saliva or nasopharyngeal discharge. Have patient rinse mouth with water before collecting specimen to minimise contaminating specimen with food particles, mouthwash, or oral drugs, which may inhibit the growth of mycobacteria. For induced sputum, use sterile hypertonic saline. Avoid sputum contamination with nebulizer reservoir water. Saprophytic mycobacteria in tap water may produce false-positive culture or smear results. Indicate on request if specimen is induced sputum, as these watery specimens resemble saliva and risk rejection as inadequate.	24 hour specimens

Stool	1 tablespoon-sized specimen in a sterile, wax-free, disposable container	Collect specimen directly into container, or transfer from bedpan or plastic wrap stretched over toilet bowl. Wax from container may produce false-positive smear.	Frozen specimen. Utility of culturing stool for acid-fast bacilli remains controversial.
Tissue biopsy sample	1g of tissue, if possible, in sterile container without fixative or preservative.	Collect aseptically. Select caseous portion if available. Do not immerse in saline or other fluid and do not wrap in gauze. Freezing decreases yield.	Specimen submitted in formalin.
Trans-tracheal aspirate	As much as possible in sterile container		
Urine	As much as possible (minimum – 40ml) of first morning specimen obtained by catheterisation or of midstream clean catch in sterile container. For suprapubic tap, as much as possible in sterile container.	Collect first morning specimen on 3 consecutive days. Only one specimen per day is acceptable. Organisms accumulate in bladder overnight, so first morning void provides best yield. Specimens collected at other times are dilute and are not optimal.	24 hour pooled specimens, urine from catheter bag. Specimens of <40ml unless larger volume is not obtainable.

Wound material	See biopsy or aspirate	Swabs are acceptable only if biopsy or aspirate is not obtainable. If used they must be placed in transport medium (Amies or Stuarts). Negative results are not reliable.	Dry swab
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### IMMUNOLOGY

(Nephelometry/Syphilis laboratory	021-9384001
Immunofluorescence laboratory	021-9386238
Elisa Laboratory	021-9384018
Flow Cytometry laboratory	021-9385278
Laboratory Manager	021-9385564

Test	Comments	Sample	Schedule
<b>1. Nephelometry</b>			
C3		Clotted blood	Daily
C4		Clotted blood	Daily
Anti-Streptolysin O	ASOT & DNASB are always done together.	Clotted blood	Daily
Anti-Dnase B		Clotted blood	Daily
Rheumatoid factor		Clotted blood	Daily
<b>2. Syphilis</b>			
RPR	Screening test for Syphilis before specialized tests are done	Clotted blood/ EDTA (for screening only)	Daily
VDRL	Only on CSF's	CSF	weekdays
<b>3. Fluorescence</b>			
FTA	Done after RPR/VDRL screen	Clotted blood/ CSF	weekdays
Bilharzia		Clotted blood	Weekdays (can be batched)

Coxiella		Clotted blood	weekdays
Legionella IFA		Clotted blood	Weekdays
Mycoplasma IgM IFA		Clotted blood	weekdays
Rickettsia IgG/IgM IFA		Clotted blood	weekdays
Pneumocystis carinii IFA		Tracheal aspirates, sputa, etc	weekdays
Anti-nuclear factor IFA	Lupus screening test	Clotted blood	weekdays
Centromere Ab's		Clotted blood	weekdays
Liver/Kidney Microsomal Ab's		Clotted blood	weekdays
Mitochondrial Ab's		Clotted blood	weekdays
Smooth muscle Ab's		Clotted blood	weekdays
Parietal cell Ab's		Clotted blood	weekdays
Glomerular basement membrane Ab's		Clotted blood	weekdays
<b>Aquaporin 4</b>		Clotted blood	weekdays
<b>4. Elisa:</b>			
Anti-Double Stranded DNA Ab's		Clotted blood	weekdays
Anti-Neutrophil Cytoplasmic Ab's		Clotted blood	weekdays
Anti-Cardiolipin Ab's		Clotted blood	weekdays
GAD/IA <sub>2</sub> - Ab test	Type 1 diabetes mellitus autoimmune disease	Clotted blood	weekdays
Anti-Cyclic Citrunillated Peptide	Confirmatory test for RA	Clotted blood	weekdays
Entamoeba IgG		Clotted blood	weekdays
Jo-1 Ab's		Clotted blood	weekdays
Brucella IgM/IgG		Clotted blood	weekdays
Intrinsic Factor antibody			weekdays

Tissue transglutaminase Ab's	Replacement for endomesium	Clotted blood	weekdays
Thyroid Hormone Receptor Antibody		Clotted blood	weekdays
Cysticercus		Clotted blood	weekdays
Echinococcus		Clotted blood	weekdays
Extractable nuclear Ab's- Ab's-RNP/SM Ab's	Done on Positive ANA Samples	Clotted blood	weekdays
Anti-Ro (SSA) Ab's		Clotted blood	weekdays
Anti-La (SSB) Ab's		Clotted blood	weekdays
Leptospira		Clotted blood	weekdays
Scl 70 Ab's		Clotted blood	weekdays
Toxocara	Refer to JHB Immunology	Clotted blood	
Toxoplasma IgG/IgM/ Avidity		Clotted blood	weekdays
Vaccination studies	Haemophilus influenza Ab's	Clotted blood	weekdays
Vaccination studies	Streptococcus pneumoniae Ab's	Clotted blood	weekdays
Vaccination studies	Clostridium tetanus Ab's	Clotted blood	weekdays
Vaccination studies	Coryne-bacterium diphtheriae Ab's	Clotted blood	weekdays
Vaccination studies	Bordetella pertussis Ab's	Clotted blood	weekdays
<b>5. Agglutination tests:</b>			
Total haemolytic Complement(RID)	Must arrive on ice	Clotted blood	weekdays
Widal		Clotted blood	Daily
Yersinia		Clotted blood	Daily
Anti-Thyroid Ab's		Clotted blood	weekdays

<b>6. Cellular/Flow Cytometry :</b>			
T, B & NK cell counts on BAL specimens	Done on Bronchio-alveolar lavage	BAL	Prior arrangement with laboratory
CD3 / CD4 / CD8 counts	Done on all non-ARV samples	EDTA blood	Daily
T, B & NK cell counts	Done on samples when requested-specialized markers for Immune monitoring	EDTA blood BAL	Daily
PLG-CD4	Done on all ARV classified patients as well as non-ARV patients-CD4 count only!	EDTA blood	Daily
HLA B27		EDTA blood	Daily
Lymphocyte proliferation	PHA: T-cell mitogen only	EDTA blood	Prior arrangement with the laboratory
	Con A: T-cell mitogen only	EDTA blood	Prior arrangement with the laboratory
	Prot A: B-cell mitogen only	EDTA blood	Prior arrangement with the laboratory
	Pwm: T-cell dependent B-cell mitogen	EDTA blood	Prior arrangement with the laboratory
	Candida: T-cell antigenic stimulant	EDTA blood	Prior arrangement with the laboratory

Respiratory burst / NBT		Heparin blood	Prior arrangement with the laboratory
Phagocytosis		EDTA blood + Clotted blood	Prior arrangement with the laboratory
Bacterial killing		EDTA blood + Clotted blood	Prior arrangement with the laboratory
Chemotaxis		EDTA blood + Clotted blood	Prior arrangement with the laboratory
<b>NB!</b> → <b>Lymphocyte proliferation tests, Neutrophil function tests and BAL</b> → <b>must be pre-arranged and booked for a specific day.</b> → <b>The blood must reach this lab before 09h00 on the day for which it was booked.</b> → <b>The blood must be freshly taken (not older than 6hrs after blood taking) and immediately transported to the laboratory.</b>			
<b>Referred tests:</b>			
Acetyl Choline Receptor Ab's		Clotted blood	Sent to GSH
C1 esterase inhibitor	Functional assay available at a later stage Antigen screen referred to JHB Immunology	Clotted blood	Screening test done at JHB NHLS.
C' fractions	Only C6 screen available	Clotted blood	Referred to JHB NHLS.
IgG subclasses		Clotted blood	Done at JHB NHLS
Avian precipitins		Clotted blood	Referred to GSH

Chlamydia	Antigen detection	Chlamydia swab/ ordinary swab but care should be taken not to let swab dry out	Referred to GSH
Fungal precipitins		Clotted blood	Referred to GSH
Glaidin Test		Clotted blood	Referred to JHB

### **VIROLOGY LABORATORY SERVICES**

#### CONTACT DETAILS:

Results and reception	Tel no: 021 938 9557
Serology	Tel no: 021 938 9348
Isolation	Tel no: 021 938 9348
Molecular	Tel no: 021 938 9348/9555
Pathologist	Tel no: 021 938 9691/9057
Registrars	Tel no: 021 938 9347
Tygerberg Hospital switchboard	Tel no: 021 938 4911

### **MOLECULAR LABORATORY**

Please refer to the table for a list of nucleic acid detection tests offered by the Virology laboratory. If you require any tests that are not listed, please phone the laboratory for discussion. Unless otherwise indicated, all tests listed are performed and results sent out daily.

TEST	SAMPLE TYPE	SPECIAL INFORMATION / TAT	CODES
HIV-1 DNA (+RNA) PCR	EDTA blood, dried blood spot	Daily / 24 hours	PCRHQ
HIV-1 Viral Load	EDTA blood (PPT tube)	Daily / 24 hours	HIVVL
HIV-1 resistance genotyping	EDTA blood (2 tubes)	Weekly	HIVDR
HIV-2 PCR	EDTA blood	Referred	-
HTLV-1 DNA PCR	EDTA blood	Referred	PCRTL
Influenza A/H1N1 (Novel) 2009	Respiratory samples and swabs	Mondays/Wednesdays and Fridays	PCRRV

HSV PCR	CSF	Mondays/Wednesdays and Fridays	PCRMV
VZV PCR	CSF	Mondays/Wednesdays and Fridays	PCRMV
EBV PCR (qualitative)	EDTA blood, CSF	Mondays/Wednesdays and Fridays	PCRMV
EBV PCR (semi-quantitative)	EDTA blood	Referred	-
CMV PCR (qualitative)	CSF, EDTA blood, urine, amniotic fluid	Mondays/Wednesdays and Fridays	PCRCM
CMV PCR (semi-quantitative)	CSF, EDTA blood, urine, amniotic fluid	Daily / 24 hours	CMVVL
HBV PCR (qualitative)	EDTA blood	Referred	PCRHB
HBV Viral Load	EDTA blood	Referred	HBVVL
HCV PCR (qualitative)	EDTA blood	Referred	PCRHC
HCV PCR (semi-quantitative)	EDTA blood	Referred	HCVL
HCV Genotyping	EDTA blood	Referred	HCGEN
JC polyomavirus PCR	CSF	Referred	PCRJC
BK polyomavirus PCR	Urine	Referred	PCRBK
Rubella PCR	Urine, amniotic fluid	Weekly	PCRRU
Measles PCR	Urine, amniotic fluid	Weekly	PCRME
Mumps PCR	Urine, CSF	Mondays/Wednesdays and Fridays	PCRMV
Parvovirus PCR	EDTA blood	Referred	PCRVP
Enterovirus PCR	EDTA blood, CSF	Mondays/Wednesdays and Fridays	PCREV
Respiratory Panel PCR	Respiratory sample	Mondays/Wednesdays and Fridays	RCR15

Meningitis Panel PCR (Herpes virus and Enterovirus)	CSF (other samples by consultation)	Mondays/Wednesdays and Fridays	PCRMV
Enterovirus genotyping	EDTA blood, CSF, stool	On request	-
Adenovirus genotyping	Respiratory samples, stool	On request	-
HCV viral load	EDTA blood	Thursdays	HCVL

## SEROLOGY LABORATORY

Results and reception Tel no: 021 938 9557

Serology Tel no: 021 938 9348

Please refer to the table for a list of serological tests offered by the Virology laboratory. If you require any tests that are not listed, please phone the laboratory for discussion. Unless otherwise indicated, all tests listed are performed and results sent out daily.

Ideally 5ml clotted blood (yellow top) should be sent for serological tests. The actually required minimum volume depends on the number of tests requested. Generally, the presence of IgM antibodies indicates recent or active infection and of IgG antibodies past or ongoing infection (depending on virus) and/or immunity (following immunisation or infection).

TEST	SPECIAL INSTRUCTIONS / TAT	CODES
HIV ELISA (4th generation)	Daily / 24 hours	HIVCA
Rapid HIV (screening)	Daily for after-hours requests – samples are sent to Chemical Pathology. Done on request / 1 hour	HIVR
Hepatitis A total antibodies	Daily / 24 hours	HEPAG
Hepatitis A IgM	Daily / 24 hours	HEPAM
Hepatitis B immunity (HBsAb)	Specify "for immune status only". Daily / 24 hours	HBSAB
Hepatitis B active infection	Extended markers done if indicated. Daily / 48 hours for extended markers. For Tygerberg patients only	HBVAC HEPAC

Hepatitis Bs Antigen	Daily / 24 hours	HBSAG
Hepatitis B extended markers	Daily / 24 hours. Extended markers done if indicated or requested	HEPBX
Hepatitis B Core-M	Daily / 24 hours. Extended markers done if indicated or requested	HBIGM
Hepatitis B anti-HBe	Daily / 24 hours. Extended markers done if indicated or requested	HBEAB
Hepatitis B HBeAg	Daily / 24 hours. Extended markers done if indicated or requested	HBEAG
Hepatitis C	Daily / 24 hours	HEPC
CMV IgG	Daily / 24 hours	CMVG
CMV IgM	Daily / 24 hours	CMVM
Herpes Simplex IgG	Weekly	HERPG
Herpes Simplex IgM	Weekly	HERPM
Varicella IgG	Daily / 24 hours	VZVG
Varicella IgM	Weekly	VZVM
EBV VCA/EBNA IgG	Daily / 24 hours	EBVCG
EBV VCA IgM	Daily / 24 hours	EBVCG
Measles IgG	Referred	MEASG
Acute Measles (not SSPE or immunity)	5ml clotted blood (must be accompanied by a urine sample or throat swab – see under ISOLATION). This is a disease for which a suspected case is notifiable. Please send with completed EPID form. The specimen is referred to the reference laboratory. <b>Do not send to Virology TBH, but send directly to NICD.</b>	
Mumps IgG	Daily / 24 hours	MUMPG
Mumps IgM	Weekly	MUMPM
Rubella IgG	Daily / 24 hours	RUBG
Rubella IgM	Daily / 24 hours	RUBM
Coxsackie B1-6 titres	Weekly	COXS

Polio 1-3 titres (immunity)	As required	POLIO
HTLV total antibody	Referred	HTLV1
Parvovirus IgG	Referred	PARVO
Parvovirus IgM	Referred	
Injury on duty (IOD) protocol	Only specimens sent via E8 Occupational Health (and F1 after hours) will be treated as IOD specimens. HIV and Hepatitis C status is tested on the contact, and Hepatitis B immunity is tested on the staff member. Further testing is done as indicated by the results, or at the request of Occupational Health. Post-exposure prophylaxis (using the antiretroviral starter pack) should be started immediately if and when indicated. Daily / 24 hours	HIVCA HEPC HBSAB

#### ISOLATION LABORATORY

Results and reception Tel no: 021 938 9557

Isolation Tel no: 021 938 9348

Please refer to the table for a list of virus isolation and detection tests offered by the Virology laboratory. If you require any tests that are not listed, please phone the laboratory for discussion. Unless otherwise indicated, all tests listed are performed and results sent out daily.

TEST	SAMPLE TYPE	SPECIAL INFORMATION / TAT	CODES
Rotavirus / Adenovirus 40/41	Stool	Rapid test. Daily / 24 hours	ROTA ADENO
Enterovirus culture	Stool, respiratory sample, CSF	14 days	CULVI
Enterovirus typing	Done on laboratory isolate	Done if Enterovirus culture is positive. Weekly	-
CMV pp65 anti-genaemia	5ml EDTA blood	Specimens older than 48 hours will not be processed. 24 hours	PP65

RSV Rapid test	Respiratory sample	If positive, shell vial culture will not follow unless specifically requested. 24 hours	RSV
Respiratory virus shell vial culture	Respiratory samples	The following viruses are included in this screen: <ul style="list-style-type: none"> <li>• CMV</li> <li>• RSV</li> <li>• Influenza A/B</li> <li>• Parainfluenza 1/2/3</li> <li>• Adenovirus</li> <li>• Human metapneumovirus</li> </ul> 48 hours A9 and A5 patients at TBH	2 X SVC  1 x SCV PCR15
Adenovirus immuno-fluorescence with shell vial culture	Respiratory samples containing adequate epithelial cells	If positive, shell vial culture will not follow. 24 hours	RVS
RSV immuno-fluorescence with shell vial culture	Respiratory samples containing adequate epithelial cells	If positive, shell vial culture will not follow. 24 hours	RVS
CMV immuno-fluorescence with shell vial culture	Respiratory samples containing adequate epithelial cells	This should be specified as it is not routinely done. If positive, shell vial culture will not follow. 24 hours	RVS
Adenovirus shell vial culture	Respiratory samples, urine, conjunctival swabs	48 hours	SVCAD
CMV shell vial culture	Respiratory samples, urine, biopsy tissue	48 hours	SVCCM
Herpes simplex shell vial culture	Swabs, aspirates, urine	48 hours	2 X SVC
Varicella shell vial culture	Swabs, aspirates, respiratory samples	48 hours	SVC



Mumps shell vial culture	Respiratory sample, urine, CSF	48 hours	SVC
Measles shell vial culture	Swabs, CSF, urine	48 hours	SVC
Acute Measles. <b>Do not send to Virology TBH, but send directly to NICD.</b>	Urine sample or throat swab (Must be accompanied by 5ml clotted blood – see SEROLOGY)	Please send with completed EPID form. This is a disease for which a suspected case is notifiable, and is referred to the reference laboratory.	-
Acute flaccid paralysis. <b>Do not send to Virology TBH, but send directly to NICD.</b>	2x stool samples taken 24 hours apart	Please send with completed EPID form. This is a disease for which a suspected case is notifiable, and is referred to the reference laboratory.	-

## SPECIAL PATHOGENS

### ACUTE MEASELS PROTOCOL

#### Case definition:

- Fever
- Maculopapular rash
- Cough or runny nose or conjunctivitis

#### Suspected Measles notification and testing protocol in brief:

- Clotted blood and urine (or throat swab) must be sent to the laboratory.
- Contact the infection control unit/nursing sister for the relevant forms:
  - A case investigation form must be filled in and sent with the specimens.
  - A notification form GW17/5 must be filled in.
- An EPID number must be obtained when the case is telephonically reported to EPI-WCP at 021 483 5691 / 3156.

### ACUTE FLACCID PARALYSIS (AFP) PROTOCOL

#### Case definition:

- Acute flaccid paralysis (including Guillian-Barrè Syndrome)
- Under 15 years of age, no apparent cause
- Any age, polio has been diagnosed by a medical officer

#### Acute Flaccid Paralysis notification and testing protocol in brief:

- Stool must be sent to the laboratory, followed by another specimen 24 hours later.
- Contact the infection control unit/nursing sister for the relevant forms:
  - A case investigation form must be filled in and sent with the specimens.
  - A notification form GW17/5 must be filled in.
- An EPID number must be obtained when the case is telephonically reported to EPI-WCP at 021 483 5691 / 3156.

### OTHER SPECIAL PATHOGENS

For special pathogens, please contact Virologist at lab or via the pager system to discuss the case before sending specimens. In some cases, the reference laboratory will need to be notified in advance. Most cases of suspected viral haemorrhagic fever are due to other causes, and a clinical consultation may provide better information for both clinician and pathologist.

VIRUS	SAMPLE TYPE	SPECIAL INFORMATION
Rabies	Saliva, brain biopsy, CSF, clotted blood	Consult with pathologist
Viral haemorrhagic fevers	5ml EDTA blood and 5ml clotted blood	Consult with pathologist
Arboviruses	Clotted blood, various	Consult with pathologist

### 1. GUIDE TO APPROPRIATE SPECIMENS

#### GENERAL INSTRUCTIONS:

- All diagnostic information from the virology laboratory is contingent on the quality of specimen received. A poorly collected and/or poorly transported specimen can result in:
  - Failure to isolate the causative virus, and
  - Contamination with bacteria or fungi.
  - Haemolysis of blood samples

- Safety considerations with regard to the handling of specimens:
  - Treat all specimens as potentially hazardous
  - Do not contaminate the external surface of the collection container and/or its accompanying paperwork
  - Minimize direct handling of specimens in transit from the patient to the laboratory. Ideally, specimens should be placed in plastic sealable bags with a separate pouch for the specimen request form.
- Please ensure that samples are correctly labelled and that the request form is filled in with all the relevant data.
- The points listed below each specimen type are to enable clinicians, nursing staff and patients to be able to take a good quality specimen.
- Clinicians, nursing staff and patients are responsible for ensuring that these guidelines are followed.
- Please contact the laboratory if in any doubt as to the collection or transport of a specimen.

#### a. FAECAL SPECIMENS

##### COLLECTION AND TRANSPORT

- Acceptable specimens: Specimens should be submitted to the laboratory in a sterile screw- cap jar as soon after collection as possible (i.e. within 1 to 2 hours). Care should be taken to ensure that the specimen is not contaminated with urine. The stool should be a freshly passed stool specimen.
- A 1- 2g quantity is sufficient for virological processing.
- Submit rectal biopsy specimens in a sterile screw-cap jar with a small amount of sterile water to prevent desiccation. Specimens for virological processing must not be submitted in formalin.
- Specimens for Acute Flaccid Paralysis (enteroviruses) should be sent on ice.

##### ACUTE FLACCID PARALYSIS NOTIFICATION AND TESTING PROTOCOL IN BRIEF

- An EPID number must be obtained when the case is telephonically reported to EPI-WCP at 021 483 5691 / 3156.
- A case investigation form must be filled in and sent with the specimens.
- A notification form GW17/5 must be filled in.
- Stool must be sent on ice to the laboratory, followed by another specimen 24 hours later.

##### Case definition:

- Acute flaccid paralysis (including Guillian-Barré Syndrome)
- Under 15 years of age, no apparent cause

#### b. URINE SPECIMENS

##### COLLECTION AND TRANSPORT

Urine is normally a sterile body fluid. However, unless it is collected properly, it can become contaminated with microorganisms from the perineum, urethra or vagina. The following guidelines are provided to ensure proper specimen collection and subsequent, prompt delivery of urine samples to the laboratory.

##### A. SPECIMEN COLLECTION

###### 1. Midstream urine specimens (MSU):

- The person obtaining the urine specimen should wash their hands with soap and water, rinse, and dry. If the patient is collecting the specimen, he/she should be given detailed instructions, including diagrams or a pictorial display.
- **Females:** Cleanse the urethral opening and the vaginal vestibule area with clean gauze pads soaked with sterile saline. Hold labia apart during voiding.
- **Males:** Cleanse the penis, retract the foreskin (if not circumcised), and wash with sterile saline. Keep foreskin retracted during voiding (to minimise contamination with skin flora).
- **Both females and males:** Allow a few millilitres of urine to pass (DO NOT STOP THE FLOW OF URINE) and collect the midstream portion of urine in a sterile container. In circumcised men, cleansing of the peri-urethral area does not improve the detection of bacteriuria and is therefore not necessary. Collect voided urine directly into a sterile container; do not use a urinal or bedpan for collection.

###### 2. Catheter urine

- A straight (non-indwelling) catheter is used by a physician to obtain urine directly from the bladder.
- Avoid contamination during urine collection from indwelling catheters.
- This procedure is not routinely recommended because there is a risk of introducing microorganisms into the bladder.

###### 3. Urine from an ileal conduit must be collected after removal of the external device and insertion of a catheter into the cleansed stoma.

###### 4. Urine collected by suprapubic needle aspiration of the bladder avoids contamination associated with the collection of voided urine. This is the preferred method for infants and for patients for whom the interpretation of results of voided urine is difficult.

## B. SPECIMEN TRANSPORT

- Transport urine to the laboratory as soon as possible after collection.
- Urine specimens must be submitted for culture within 2 hours after collection, or refrigerated and cultured within 24 hours whenever possible.
- **All specimen containers must be closed tightly to prevent leaking. If sample has grossly leaked from the container, the specimen will be rejected and not processed. If the specimen has leaked slightly, decontaminate the outside of the container with 70% alcohol prior to transport.**

### SUSPECTED MEASLES NOTIFICATION AND TESTING PROTOCOL IN BRIEF:

An EPID number must be obtained when the case is telephonically reported to EPI-WCP at 021 483 5691 / 3156.

A case investigation form must be filled in and sent with the specimens.

A notification form GW17/5 must be filled in.

Stool must be sent on ice to the laboratory, followed by another specimen 24 hours later.

#### Case definition:

- **Fever**
- **Maculopapular rash**
- **Cough or runny nose or conjunctivitis**

## C. STERILE BODY FLUIDS INCLUDING CSF

### COLLECTION AND TRANSPORT

#### 1. CEREBROSPINAL FLUID (CSF)

Please note: CSF MUST BE COLLECTED PRIOR TO ANTIMICROBIAL THERAPY!

Collection considerations for Central Nervous System (CNS) specimens:

Assay	Optimal volume	Comments
Culture	1-2ml	
PCR	1-2ml	
Serology	1-2ml	NOT ideal specimen for serology.

Volumes are guidelines. Greater volumes increase the chance of organism recovery.

- The laboratory, irrespective of the volume received, must process all CSF specimens.
- CSF specimens should be transported to the laboratory promptly. Failure to do this may result in the non-viability of some viruses.
  - In addition to routine information, it is essential that the patients' specimen label accurately reflects:
    - The specific body site from which the specimen was taken
    - Provisional diagnosis
- The ideal tubes for CSF specimens are tubes with no additives or clotting activators.
- 
- If prompt delivery is not possible CSF specimens should be kept at 4-8°C for viral culture.
- CSF should not be added to viral transport medium.
- The ideal tube for CSF specimens is a red-topped tube with no additives or clotting activators.

#### 2. OTHER STERILE FLUIDS

Vesicle fluid

- Vesicle fluid should be aspirated using a sterile technique, and inoculated into viral transport medium. Transport medium can be drawn up into the syringe and then expelled to flush the syringe and ensure that a maximum amount of vesicle fluid is obtained.
- In the past, it has been permissible to use the aspirating syringe as the transport container provided the needle was capped. This practice is no longer acceptable because of the increased possibility of needle-stick injuries.

Other: Contact the virologist to discuss the clinical case and possible tests.

#### SPECIMEN COLLECTION

- Specimens should be collected with as little contamination from indigenous microbial flora as possible to ensure that the sample will be representative of the infected site.
- Sterile equipment and aseptic technique must be used to collect specimens to prevent introduction of microorganisms during invasive procedures.
- In addition to routine information, it is essential that the patients' specimen label accurately reflects:

- a. The specific body site from which the specimen was taken
- b. Provisional diagnosis
- Collect specimens in sturdy, sterile, screw cap, leak-proof containers with lids that do not create an aerosol when opened.

#### TRANSPORT

- **Syringes:**  
Specimens obtained by a doctor using needle aspiration should be transferred to viral transport medium prior to transport to the laboratory. Transport medium can be drawn up into the syringe and then expelled to flush the syringe and ensure that a maximum amount of fluid is obtained.
- **Swabs**  
If a swab is taken it is essential that it be placed in viral transport medium. The swab should be placed into the bottle, and the shaft broken off. This will allow the bottle to close. Swabs for virological testing must not be put into the gel medium used for bacterial culture. Viral transport medium should be used instead.
- **RESPIRATORY SWABS** Swabs for viral culture can be taken from the nasopharynx or oropharynx.
- Multiple swabs taken from the same patient can be pooled in a single container of viral transport medium.
- d. **SWABS OF ULCER BASES:**
  - Specimens should preferably be collected prior to the administration of antiviral therapy.
  - Remove overlying debris.
  - Vigorously swab or curette the base of the ulcer. Ulcer scrapings can be sent for culture.
  - If exudate is present from the ulcer, collect it with a syringe or a sterile swab.
- e. **TISSUE SPECIMENS**

#### Biopsies and tissue specimens:

Tissue should be sent in viral transport medium. If this is not available, use sterile water or saline. Do NOT use formalin. Brain tissue for rabies investigation should be sent in sterile glycerol-saline (50%/50%) – consult the pathologist.

#### Fine needle aspiration:

Specimens obtained by a doctor using needle aspiration should be transferred to viral transport medium prior to transport to the laboratory. Alternatively, and only if transferring it from the syringe will compromise the specimen, **the doctor**

**should remove the needle**, using a protective device to avoid injury, and cap the syringe with a sterile cap prior to transporting it to the laboratory. If the latter procedure is followed it is essential that the specimen be submitted to the laboratory immediately after collection.

#### GENERAL RECOMMENDATIONS FOR SPECIMEN COLLECTION FOR SEXUALLY TRANSMITTED DISEASES:

**Cervical swabs:** The cervix should be visualized via speculum examination and normal or inflammatory discharges should be removed with swabs. Swabs for Herpes Simplex Virus (HSV) should be collected from the ectocervix.

**Genital Ulcer:** Swabs should be used to obtain specimens from the ulcer base and placed into appropriate transport medium. If vesicles are also present in the same area, vesicle fluid may be collected after lancing the vesicle.

**Vesicles:** Vesicle fluid may be collected after lancing the vesicle, or aspirated from the vesicles.

#### TRANSPORT

- All specimens should be transported to the laboratory promptly. Failure to do this may result in overgrowth of bacteria.
- If prompt delivery is not possible specimens should be refrigerated at 4-8°C
- Syringes:
- Specimens obtained by a doctor using needle aspiration should be transferred to viral transport medium prior to transport to the laboratory. Alternatively, and only if transferring it from the syringe will compromise the specimen, **the doctor should remove the needle**, using a protective device to avoid injury, and cap the syringe with a sterile cap prior to transporting it to the laboratory. If the latter procedure is followed it is essential that the specimen be submitted to the laboratory immediately after collection.

#### f. SPUTUM AND RESPIRATORY TRACT SPECIMENS

##### INTRODUCTION:

Infections of the lower respiratory tract are a major cause of morbidity and mortality. Diagnosis of these infections frequently is complicated by the contamination of specimens with upper respiratory tract secretions during collection.

### SPECIMEN COLLECTION:

Specimens include sputum, tracheal aspirates, bronchial washings, bronchial brushes, bronchial biopsy specimens, bronchoalveolar lavage fluid, trans-tracheal aspirate, lung aspirate and lung biopsy specimens.

#### • Throat (Pharyngeal specimens):

- Do not obtain throat samples if epiglottis is inflamed, as sampling may cause serious respiratory obstruction.
- Depress tongue gently with tongue depressor.
- Extend sterile swab between the tonsillar pillars and behind the uvula. (Avoid touching the cheeks, tongue, uvula, or lips).
- Sweep the swab back and forth across the posterior pharynx, tonsillar areas, and any inflamed or ulcerated areas to obtain sample.

#### • Nasopharyngeal swabs:

- Carefully insert a swab through the nose into the posterior nasopharynx, and rotate the swab.

#### • Nasopharyngeal aspirates

- Attach syringe to tube and fill 5ml syringe with saline or viral transport medium. Instill saline into nostril and aspirate the recoverable nasal specimen immediately. Inject aspirated specimen into container containing virus transport medium

#### • Tracheal aspirates

- Bronchoalveolar lavages

### GUIDELINES FOR PROPER SPECIMEN TRANSPORT:

- All specimen containers must be tightly closed. **Leaking specimens will compromise the quality of results.**
- Specimens must be transported to the laboratory promptly. Failure to do this may result in the death of fastidious organisms and in overgrowth by more hardy bacteria.
- If prompt delivery is not possible, specimens should be refrigerated at 4 – 8°C.
- The longer the delay in reaching the laboratory, the lower the yield of virus, and the less sensitive the culture.

### GUIDELINES FOR BLOOD SPECIMENS:

Please consult the list of tests to see which type of blood specimen is required.

- In general, only two types of blood specimens are used – clotted blood for serology, and EDTA blood for other assays.
- Serology – clotted blood (yellow or red-topped tube)
- CMV pp65 antigenaemia – EDTA blood needs to arrive at the laboratory before 15:00. Samples older than 48 hours cannot be processed.
- PCRs and viral loads done on blood samples – EDTA blood

- Post-mortem blood samples are often haemolysed. Moderately haemolysed specimens might still be testable, but severely haemolysed specimens are often untestable.

### FORENSIC MEDICINE

No tests are performed in the Department of Forensic Medicine and Pathology. Most blood specimens are sent to the Woodstock Police testing facility to maintain the chain of evidence.

It is of the utmost importance that clinicians always strive to maintain the chain of evidence in all cases where medico-legal intervention is anticipated, for example where blood is taken from a patient for ethanol concentration determination, or projectiles are collected during surgery in gunshot cases.

For practical pointers regarding maintenance of chain of evidence during evidence collection, please contact the department or doctor on call at the following numbers:

#### CONTACT DETAILS:



Head of Discipline, all personnel: Tel no: 021 938 9325 / 931 8043

On call registrar: Tel no: pager number 444 Tygerberg Hospital

### HUMAN GENETICS LABORATORY

Telephone number: 938 4217, 938 9089 or 938 4760

List of tubes used for Phlebotomy

Collection Tube	Additive	Mode of Action	Uses
Purple 	EDTA liquid	Forms calcium salts to remove calcium	DNA extraction - invert 8 times to prevent clotting and platelet clumping
Dark Green 	Sodium heparin or lithium heparin	Inactivates thrombin and thromboplastin	Blood culturing for chromosome analysis - invert 8 times to prevent clotting and platelet clumping
Sterile (Greiner or Falcon)	10 – 15 ml of amniotic fluid		Amnion fluid culturing for chromosome analysis

<b>Sterile</b>	5 – 8 ml HBSS or Transport medium	Preserves solid tissue	Solid tissue culturing for chromosome analysis or solid tissue for DNA extraction
<b>Sterile</b>	5-8 ml HBSS with heparin		Chorionic Villus for chromosome analysis or for DNA extraction

#### General Instructions:

- Please ensure prompt, adequate mixing of blood samples taken into anticoagulant. These samples should be mixed adequately by gently inverting at least 8 times – **do not shake!** Failure to mix adequately may result in the sample clotting rendering it unsuitable for analyses. Vigorous shaking will cause haemolysis of sample.
- Coagulation samples:
  - Full draw is critical** – the correct anticoagulant/blood ratio is essential for accurate results.
  - Please ensure that coagulation specimens reach laboratory within 24 hours. Paediatric/neonate tubes are available from the lab – please phone lab stores (ext. 2207/2238) to place your order. These tubes are commercially available if you are outside the laboratory service area.
  - Haemolysis must be avoided.
  - Send coagulation specimens at room temperature unless otherwise advised by the laboratory.
- Safety considerations with regard to the handling of specimens:
  - Treat all specimens as potentially hazardous
  - Do not contaminate the external surface of the collection container and/or its accompanying paperwork
  - Minimize direct handling of specimens in transit from the patient to the laboratory. Ideally, specimens should be placed in plastic seal able bags with a separate pouch for the specimen request form.
- Please ensure that samples are correctly labelled and that the request form is filled in with all the relevant data.
- The points listed below each specimen type are to enable clinicians, nursing staff and patients to be able to take a good quality specimen.
- Clinicians, nursing staff and patients are responsible for ensuring that these guidelines are followed.
- Please contact the laboratory if in any doubt as to the collection or transport a specimen.

**All specimen containers must be closed tightly to prevent leaking. If sample has grossly leaked from the container, the specimen will be rejected for processing. If specimen has leaked slightly, decontaminate the outside of the container with 70% alcohol prior to processing.**

**If any of the tests that you require are not listed in the table below, please phone the laboratory for special instructions. Tests listed below are the common human genetic diagnostic tests available.**

TEST	SAMPLE TYPE	SPECIAL INSTRUCTIONS
<b>Chromosome Analysis (Karyotype):</b>		
Blood (Peripheral & Umbilical)	2ml heparinised blood (green top)	
Amniotic fluid	10 - 15ml amniotic fluid in sterile Falcon or Greiner tube	
Chorionic villus	Sterile tube with heparin and HBSS or transport media	Obtain tube with specific heparin concentration from laboratory
Solid tissue (eg. Product of conception, skin biopsy, etC.)	1sq cm solid tissue in sterile tube with 5 ml HBSS or transport media	Obtain tube from laboratory
Fanconi Anaemia	5ml heparinised blood (green top)	
<b>Fluorescent in situ hybridisation (FISH) with:</b>		
Down syndrome probe	5ml heparinised blood (green top)	
Edward syndrome probe	5ml heparinised blood (green top)	
Patau syndrome probe	5ml heparinised blood (green top)	

Sexing probe	5ml heparinised blood (green top)	
Williams syndrome probe	5ml heparinised blood (green top)	
Di George syndrome probe	5ml heparinised blood (green top)	
Angelman syndrome probe	5ml heparinised blood (green top)	
Smith Magenis syndrome probe	5ml heparinised blood (green top)	
Prader-Willi syndrome probe	5ml heparinised blood (green top)	
<b>Molecular Genetics (DNA test):</b>		
Spino-cerebellar Ataxia (SCA)	5ml EDTA blood (purple top)	
Friedreich's Ataxia	5ml EDTA blood (purple top)	
Huntington Disease	5ml EDTA blood (purple top)	
Retinal Degenerative Disorder	5ml EDTA blood (purple top)	
Becker Muscular Dystrophy	5ml EDTA blood (purple top)	
Duchenne Muscular Dystrophy	5ml EDTA blood (purple top)	
Myotonic Dystrophy	5ml EDTA blood (purple top)	
Mitochondrial Disease	5ml EDTA blood (purple top)	
Charcot-Marie-Tooth	5ml EDTA blood (purple top)	
Dentatorubral Pallidoluisan Atrophy	5ml EDTA blood (purple top)	
Cystic Fibrosis	5ml EDTA blood (purple top)	
Galactosaemia	5ml EDTA blood (purple top)	
Familial Adenomatous Polyposis (FAP)	5ml EDTA blood (purple top)	

Hereditary Non Polytopic Colon Cancer (HNPCC)	5ml EDTA blood (purple top)	
Familial Breast Cancer (BRACA1/2)	5ml EDTA blood (purple top)	
Haemophilia A	5ml EDTA blood (purple top)	
Fragile X Syndrome	5ml EDTA blood (purple top)	
Spinal Muscular Atrophy (SMA)	5ml EDTA blood (purple top)	
Polycystic Kidney Disease	5ml EDTA blood (purple top)	
<b>Diagnostic test for rare genetic diseases:</b>		<a href="http://www.doh.gov.za/docs/index.html">http://www.doh.gov.za/docs/index.html</a> or consult the laboratory

#### STERILE AMNION FLUID, SOLID TISSUE AND CHORIONIC VILLUS - COLLECTION AND TRANSPORT

##### Collection considerations for Amnion Fluid specimens:

Culture/ Test	Optimal volume (ml)a	Comments
Amniotic fluid / Chromosome analysis or DNA extraction	10 - 15 ml	Send specimen to human genetics laboratory immediately.
Amniotic fluid / FISH analysis	10- 15 ml	Send specimen to human genetics immediately
Solid Tissue / Chromosome analysis or DNA extraction	0.5 sq meter in 5-8 ml transport medium	Send specimen to human genetics immediately
Chronic Villus / Chromosome analysis or DNA extraction	In 5-8 ml transport medium with heparin	Send specimen to human genetics immediately

- **If prompt delivery is not possible specimens should be refrigerated at 4-8°C.**

## SPECIMEN COLLECTION

1. Specimens should be collected with as little contamination from indigenous microbial flora as possible to ensure culture growth.
2. Sterile equipment and aseptic technique must be used to collect specimens to prevent introduction of microorganisms during invasive procedures.
3. If a specimen is to be collected through intact skin, cleanse the skin first. For example, use 70% alcohol followed by iodine solution (1-2% tincture of iodine or 10% solution of povidone-iodine). **Prevent burn by tincture of iodine by removing excess after the specimen has been collected.**
4. In addition to routine information it is essential that the patients' specimen label accurately reflects:
  - o The specific body fluid the specimen contain
  - o Provisional diagnosis and reason for referral
5. Collect specimens in sturdy, sterile, screw-cap, leak-proof containers with lids that do not create an aerosol when opened.
6. Although occasionally small clots will form in some fluids, addition of anticoagulant is not recommended; citrate or EDTA inhibits growth. If anticoagulant must be used, heparin should be the choice.

## TRANSPORT

### Sterile tubes

Fluid specimens can also be transferred into a sterile tube without preservative. The specimen should be submitted to the laboratory without delay so as not to compromise the recovery of anaerobic organisms.

## BLOOD CULTURES - COLLECTION AND TRANSPORT

### 1. PROCEDURE

#### Site selection

The phlebotomist should:

- Select a different site for each blood sample.
- Avoid drawing blood through indwelling intravenous or intra-arterial catheters.

#### Site preparation

- Vigorously cleanse the venipuncture site with 70% isopropyl or ethyl alcohol.
- Do not touch the venipuncture site after preparation and prior to phlebotomy.

#### Collection of blood

- Using syringe and needle insert the needle into the vein, and withdraw blood. Do not change needles before injecting the blood into the tube.
- After the blood is inserted into the tube mix well to avoid clotting.
- Use a new needle if vein is missed initially.
- After phlebotomy, cleanse the site with 70% alcohol and cover puncture wound appropriately.

### 2. SPECIMEN VOLUME

#### Recommended volume:

Babies (<6 months): Ideally, 1 to 2 ml of blood should be drawn per venipuncture. However, a minimum of 0.25ml x 2 is required per test.

Children (>6 months – 12 years): Ideally, 1 to 3 ml of blood should be drawn per venipuncture. However, a minimum of 0.3ml x 2 is required per test.

Adults (>12 years): Ideally 5 ml blood per tube. However, a minimum of 0.35ml x 2 is required per test.

#### **QUALITY CONTROL:**

##### **Tube**

- Check expiry dates of tubes used.
- Tubes should be stored in a cool dark place
- Discard any tubes showing abnormal characteristics.

##### **Labelling and transport**

Please ensure that all tubes are labelled correctly and that the request form is completed with all the relevant required data. All specimens should be transported to the laboratory promptly. Failure to do this may result no growth in culture with no results.



## TYGERBERG HOSPITAL EXTENSION LIST

(For direct calls add 021 938 with the extension no)

WARD	SR	SECR	WARD	SR	SECR
A1W Surgical	6040	6037	C1AW	5132	5133
A1East Burns	4751	5068	Trauma	5135	5911
A2 East Thoracic	6055	5950	C1DE Int Medicine	5941	4625
A2 West Thoracic	5951 5879	5950	C1DW Int Medicine		5978
A3W Orthopaedics	5970	5971	C2A Labour Ward	5965	4728 4707
A3 East	5854	5855	C2B Obstetrics	4345	
A4W Neuro Surgery	5176	5175	C3A Wes Paeds	4541	4539
A4 East	6302 5669	5077	C5 Plastics, Vascular		5221
A5 West Lung	5775	5773	C5 Abdomen		5215
A5 East	5761	5754	Day Surgery	6611	6619
A5 West Int Medicine	5793 5792	5773 5754	B1 Thoracic Theatre	6018	
A6 West Heart	5778	5781	Burns Unit Theatre	4841	
A6 West Int Medicine	6050 5768	5781	C2A Theatre	4713	
A7 West Nephro	5557	5666	C3B Theatre	6442	
A7 East	4491 4680	5559	Cardio Theatre	4339	
A8 West Neurology Derma	6060	6061	DLG Psychiatry	5870	5869
A8 East	6063	6062	DG Surgical	5907	4869
A9 West Paediatrics	6052	6056	D1 Vascular	4864	4866
A9 Wes Int Medicine	6057	6058	D2 Surgery	4465	4764
A10 Wes Endocrine	4583	5432	D3 Plastic Surgery	4777	4766
A10 East	4257 4584	5125	D4 Private	5073	4566
			D5 Head, Neck & Breast	5838	4064
			D6 Urology	4364	4367
			D7 Eye	4463	4466
			D8 Int Medicine	5386	5388
			D9 Int Medicine	5383	5385
			D10 Int Medicine	5980	5975
			FLG Children	4571	4573

WARD	SR	SECR	DEPARTMENT	EXT NO
FG Gynae	4412	6078	Patient Enquires	4785/4786
F1	6511	5614	West	
F2 Obstetrics B	4645	4646	Patient Transport	5492
F2 Obstetrics M	4649		East	
F3 Congo	5990	4940	PA Transport	4243/5471
F4 Orthopaedics	4155	4639	Tube System	5072/5136
GLG Psychiatry	5583	5064	X-Rays C1A	5233/5378/5868
GG Paediatrics	6378	6722	Medical reporting	5200/5866
G1 Paediatrics	6573	6570	Medical Records	4518/4512
G2 Paediatrics	4552	4556	C.S.S.D.	5884
G3 Paediatrics	4564	4565		
G4 Paediatric Surgical	4660	4658	<b>SECURITY</b>	
G5 Paediatrics	4131	4154	Control Room	5165
G6 Paediatrics	4472	4474	Emergency Phone	4282
G7 Paediatrics	4667	4664	Threats	5088
G8 Paediatrics	4723	4732	Crèche	5143
G9 Paediatrics	5635	5634	Patient Hospital School	5261
G10 Paediatrics	5004	5007	CT Scan	5599/5798
JLG Psychiatry	5121	5120	Main Kitchen	5291/4759
JG	4407	4470	Night Matron	4056/4655
J1	6533	4532	Revenue (Hosp. Fees)	5852/5857
J2 Obstetrics B	5114	5113	X-Blok Wards	4439/5939
J3	5109	5108	Mortuary	5469
J4 Obstetrics	5105	5104	Mortuary SAPS	6327 / 931-4232
J5 Obstetrics B	5029	5028	SAPS	4982 933-3787/8
J6 Orthopaedics	5017	5021	Resuscitation	4072/6286
J7 Surgical	5011	5015	Feedem	6310
J8 Paediatrics	4302	4157	Cafeteria	933-1362
Cardiac Arrest	4844		T.B.H. Fax	931-1451
Carel du Toit	5312	6066	Medical School Fax	931-7810

## CLINICS

Abdominal Surgery	5215	Gynaecology	4437
Allergies	5524	Gynaecology Oncology	4428
Allergies children up to 12 years	4539	Hand Clinic	5333
Andrology	4940	Hearing & Speech	4825
Andrology Lab	4445	Head, Neck & Breast	5210
Angiogram	5924	High Risk	4424
Asthma	5524	Infectious Diseases	4842
Barium Meal	5900	Infection Prevention and Control	5054
Breastfeeding	4441	Infertility	5173
Burns	5221	Internal Meds	5446
Cardiology	4111	Interns	5443
Cervix	4428	Liver Clinic	5524
Coagulation	4615	Lung Functions	5753
Dermatology	4068	Lung Functions Tech	5789
Diabetic Training	4024	Mammograms	4547
Diabetic	5536	Nephrology (Kidneys)	5524
Dietician	4939	Nuclear Medicine	4268
Ear, Nose & Throat	4828	Neurosurgery and Children	5221
Echo Cardiology	4332	Neurophysiology	5500
Endocrinology	5536	Neurology	5541
Epilepsy	5541	Obstetrics – New	5094
Evaluation	5061	Obstetrics – Follow up	4424
Eye surgery	5509	Obstetrics - Midwife	4424
Family Medicine	5171	Occupational Health	6181
Family Planning	4447	Ophthalmology	5509
Gastro	5531	Orthopaedics	5317
Geriatrics	5527	Paediatrics	4539

Paediatric Surgery	5215
Paediatric- Audiology	4825
Plastic Surgery	5221
Psychiatry (Children)	4573
Psychiatry (Adults)	5120
Radio-isotope	4268
Respiratories	5524
Rumatology	5527
Sonar – Stomach	5641
Sonar - Surgery	5641
Sonar - Obstetrics	5572
Staff Clinic	6181
Stress Tests	5781
Special Clinics	5541
Stoma	5976
Surgical	5221
Thoracic Surgery	5215
Tube feeding	4075
Urology	5310
Urology Gynaecology	4437
Vascular	5221
Virology - Results	71-9348
Virology	6210

LABORATORIUMS	
Anatomy's	4040
Andrology	4883
Anti-Coagulation	4615
Bone marrow	4122
Blood Grouping	6081/2
Blood Bank	4900/1
Cardiology	4339
Chemical Pathology	4934/6
Coagulation	4202
Genetics	4760
Hematology	5750
Histology	4040
Immunology	5278
Microbiology	4011
Serology	4001
Cytology	4202
Toxicology	6168
Virology	71-9354

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Western Cape  
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Health

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Health