Treatment Guidelines for Haemophilia in South Africa

Treatment Guidelines for Haemophilia in South Africa

These guidelines have been compiled by the South African Haemophilia Foundation Medical and Scientific Advisory Council (SAHF MASAC) to facilitate the appropriate management of people with haemophilia (PWH). The current guidelines are based on the publication noted below.

Mahlangu J, Gillham A; ***South African Medical Journal****, February 2008, 98(2):127 - 138*

Note to Healthcare Personnel

This booklet is intended as a guide for healthcare personnel who might not be familiar with haemophilia. People with haemophilia (PWH) and their physicians should be advised by a Comprehensive Haemophilia Treatment Centre staffed by a multidisciplinary team skilled in the care of this uncommon chronic bleeding disorder.

Parents of patients with severe haemophilia are usually trained in home infusion of the clotting Factor when their child is about four years old and self infusion is normally accomplished by 12 - 14 years of age. However, infants and boys with mild haemophilia must rely on a Haemophilia Centre or other medical facility for clotting Factor infusions.

Please contact your nearest Haemophilia Treatment Centre (listed on page 24) if you have any uncertainty regarding management.

Acknowledgement is made of all the past and current members of MASAC, who have produced the previous edition, and reviewed the current edition.

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HAEMOPHILIA OVERVIEW

Haemophilia is an inherited, x-linked, lifelong bleeding disorder which affects males almost exclusively. Most frequently haemorrhage involves joints or muscles. Bleeding patterns differ with age: infants usually bleed into soft tissues or from the mouth but as the boy grows, characteristic joint bleeding becomes more common.

Haemophilia A is the most common form of haemophilia and is due to a deficiency of clotting Factor VIII.
Haemophilia B is due to a deficiency of clotting Factor IX.

Severity

Haemophilia is classified as severe, moderate, or mild according to the levels of circulating Factor VIII or IX and indicates the expected frequency of bleeding:

- ***Severe:*** **Factor VIII or IX < 1%**
  Factor VIII or IX replacement is needed several times per month for traumatic or apparently spontaneous bleeding may be on regular prophylactic factor therapy.
- ***Moderate:*** **Factor VIII or IX 1 - 5%**
  Less frequent bleeding which usually follows trauma, surgery or dental work.
- ***Mild:*** **Factor VIII or IX > 5 - < 40%**
  Occasional bleeding, usually only after severe trauma or surgery

Factor VIII Inhibitors in Haemophilia

Inhibitors may develop in 10 - 15% of persons with haemophilia A but are much less common in haemophilia B (1 - 3%). Inhibitors are neutralising antibodies that limit the effectiveness of Factor infusions.

Risk Factors for the development of inhibitors:

- severe haemophilia
- family history of inhibitor development
- more frequent in black patients

If an individual is going to develop an inhibitor, this usually happens within the first 50 exposure days after starting Factor VIII replacement therapy.

Inhibitors titres are measured in Bethesda units (BU)

Low Responders: titre remains below < 5 BU

High Responders: titre above > 5 BU. The level may increase markedly and rapidly after Factor VIII infusion (may have rapid anamnestic response in 3 days)

Rules for Inhibitor Management

1. **Monitor all patients every 3 - 6 months for the development of inhibitors. This is particularly important and should be done more frequently in newly diagnosed black patients with severe haemophilia A, who are at greater risk.**

2. **Never undertake a surgical procedure or joint aspiration in a person with haemophilia without checking for inhibitors.**

3. **If there is no response to appropriate replacement therapy, test for inhibitors.**

4. **Call a Haemophilia Treatment Centre for advice on patient management.**

Refer to page 19 for Factor VIII inhibitor management options.

TYPES OF BLEEDING IN HAEMOPHILIA

Major bleeding episodes

- Central nervous system
- Gastrointestinal
- Neck/throat
- Severe injury
- Hip or iliopsoas
- Advanced joint/muscle
- Forearm compartment

Important

- May cause death or deformity. Advice should be sought from a Haemophilia Treatment Centre physician.
- Start appropriate Factor replacement urgently. Hospitalisation is usually required to maintain adequate Factor levels.
- If the patient has an **inhibitor,** the Haemophilia Treatment Centre must be consulted for major bleeding problems.

Minor bleeding episodes

- Joint (early)
- Muscle/soft tissue
- Mouth/gums
- Epistaxis
- Painless haematuria

Important

- Although considered minor bleeds, complications may occur. If there are uncertainties about medical management, consult a Haemophilia Treatment Centre.
- Treat early to avoid long term complications.

Haemarthrosis

Commonly affected joints

Knees, elbows, ankles, (shoulder, hip and other joint bleeds are rare).

- After one or several haemarthrosis with synovitis, a joint may become 'targeted' for recurrent bleeding and damage.
- These patients should be referred for synovectomy

Symptoms & Signs

- Tingling sensation (early)
- Stiffness
- Pain
- Limited range of motion
- Swelling
- Limp or refusal to use limb

- **Do not delay treatment.**
- **Early bleeding** can be felt by the patient before signs are apparent.
- **Obvious joint swelling** is a late sign of bleeding.

Treatment Guidelines

Replace missing Factor, see:
page 17 haemophilia A
page 18 haemophilia B

- Treat **early.**
- **Repeat infusions** in 12 to 24 hours.
- Ice packs may reduce bleeding:
  Apply 5 minutes on 10 minutes off.
- No circumferential casting.
- X-ray **not** indicated - only if fracture is suspected.
- Rest the affected joint/limb
  - posterior splint
  - sling for arm
  - no weight bearing

Muscle & Soft Tissue Bleeding

Dangerous Areas

- Quadrats femoris (thigh)
- Forearm compartment
- Neck/throat
- Iliopsoas/retroperitoneal
- Popliteal
- Gastrocnemius (calf)

- Aggressive treatment may be indicated. Consult a Haemophilia Treatment Centre for advice.
- Hospitalisation may be required.

Symptoms & Signs

- Muscle tightness (early)
- Pain
- Swelling
- Limited range of motion
- Bruising
- Warmth
- Refusal to use limb (young child)

- **Bruising may be absent with deep muscle bleeding.**
- **Muscle compartment** bleeding (calf, forearm) may cause nerve damage or vascular compromise.

Treatment

Replace missing Factor, refer to:
page 17 haemophilia A
page 18 haemophilia B

- Ultrasound or CT scan to confirm diagnosis and get baseline clot size.

- Treat **early.**
- **Repeat infusions** in 12 to 24 hours.
- Ice packs 5 minutes on, 10 minutes off.
- No circumferential casting.
- Rest affected joint/limb
  - posterior splint
  - sling
  - no weight bearing

Head Injury - a Medical Emergency

History

Minor head trauma can lead to CNS bleeding.
Unrecognised trauma is common in children.
"Spontaneous" bleeds can occur.

- Treat as a major bleed.
- **Toddlers** and young children are prone to head injury.

Symptoms & Signs

(onset may be delayed)

- Headache
- Vomiting
- Irritability/convulsions
- Lethargy/drowsiness
- Vision disturbance
- Focal neurologic deficits
- Ataxia
- Loss of consciousness
- Paralysis

Any of these with or without a history of trauma is highly suggestive of CNS bleeding. These are late features secondary to mass effect or brain irritation.
NB: Symptoms may mimic a viral infection.

Treatment

1. **Urgent Factor replacement -** measure level and maintain above 80 - 100% for 7 days. Then maintain plasma factor level at 50% for haemophilia A and 30% for haemophilia B for a further 14 days.
2. **CT scan of head**
3. **Call a Haemophilia Treatment Centre**

- **If in doubt - treat**
- Admit to hospital
- Factor replacement for possible subarachnoid bleeding is indicated even with a normal CT scan.
- For proven intracranial bleeding treatment is required for 21 days.
- Anti-epileptic medication as soon as bleed is confirmed.

Oral Bleeding

Dental / Gum Bleeding / Epistaxis / Tongue

- Bleeding can be profuse
- Swallowing blood:
  vomiting blood
  dark tarry stools
- May need Hb and HCT

- **Torn frenulum** (upper lip) bleeding is problematic in the young child.
- **Dental** injection or extraction requires prior therapy to raise Factor levels.

Treatment

Replace missing Factor,
as per minor bleed, refer to:
page 17 haemophilia A
page 18 haemophilia B

- Tranexamic acid
  (Refer to page 22).
- Local pressure.
- Ice 5 minutes on,
  10 minutes off.
- If tooth extracted use deep silk or Vicryl suture.
- Red cell transfusion if necessary.

- Cool, soft, or liquid diet following gum bleeding or dental extraction.
- Tranexamic acid solution:
  give 5 - 10 ml (500 mg / 5 ml) 6-hourly, holding in mouth for 2 minutes before swallowing. Tranexamic acid tablets can also be crushed in warm water before swallowing.
- Continue factor infusion and tranexamic acid until bleeding stops.

Gastrointestinal Bleeding

Potential emergency

- Bleeding can be profuse
- Blood / coffee-ground emesis
- Dark/tarry stools

- **Abdominal pain -** regard as a bleed until proven otherwise: infuse Factor first, then investigate as for all GIT bleeds.

Treatment

- Immediate Factor replacement refer to: page 17 haemophilia A page 18 haemophilia B as per major bleed

- Consult a Haemophilia Treatment Centre.
- Check BP, Hb & HCT.
- Concomitant tranexamic acid therapy.

- Hospitalise to maintain Factor level and monitor ongoing blood loss.
- Investigate for site of bleeding.
- May need red cell transfusion.

Genito-urinary Bleed

- Usually spontaneous

- Persistent or recurrent haematuria should be investigated

Signs & Symptoms

- May have renal angle tenderness
- Red or dark urine
- Usually no dysuria

Treatment

- Increase fluid intake (1 glass/hour)
- Bed rest
- If not resolved in 24 hours treat with Factor replacement

Refer to:

page 17 haemophilia A

Page 18 haemophilia B

- Continue to increase fluids and bed rest for 7 days

- Tranexamic acid is contraindicated

Management of Patients undergoing Surgery

Types of surgical interventions

- Minor surgery, which includes endoscopy, skin biopsy, bronchoscopy, lumbar puncture, dental procedures, etc.
- Major surgery, which includes laparotomy, arthroplasty.

Preoperative assessment and preparation

- Consultation between surgeon, haematologist and blood centre.
- Check FBC, liver function, renal function and inhibitor level.
- Do Factor recovery studies.
- Prepare a written management plan and communicate this to all stakeholders.

Treatment goals

- Raise Factor level to 50 - 80% for minor surgery and 80 - 100% for major surgery.
- Maintain Factor level at 50% for major surgery for at least 7 - 14 days.
- Avoid intraoperative and postoperative blood loss.

Treatment approach

- **Haemophilia A:**
  - for major surgery, give 40 - 50 IU/kg FVIII
  - for minor surgery give 20 - 40 IU/kg FVIII, 30 minutes before surgery, 6 hours postoperatively and then 12-hourly thereafter.
- **Haemophilia B:**
  - for major surgery, give 60 - 80 IU/kg FIX
  - for minor surgery 20 - 40 IU/kg, 30 minutes before surgery. Repeat the same dose 6 hours postoperatively and then daily thereafter.
- Factor infusion for major surgery should continue for 7 - 14 days. Venous thromboembolism (VTE) prophylaxis using elastic stockings should be considered in all high-risk surgery.
- Keep peak maintenance Factor level at 50% until healing has started.
- Introduce postoperative rehabilitation and mobilisation gradually under Factor prophylaxis.
- Continuous infusion of Factor with a pump may be used.
- Use of antibiotics postoperatively is mandatory.
- Ensure that patient receives adequate analgesia -
  NB avoid intramuscular analgesia.

Managment of Chronic Synovitis and Target Joints

- Synovitis is the inflamed state of the synovium
- Blood vessels proliferate.
- These vessels are more prone to recurrent bleeding and target joint occurs.

- Chronic synovitis is a condition that persists for 6 months or more.
- There is a predilection for large joints

Treatment

- Secondary prophylaxis (refer to page 15).
- Raise plasma level above 5 %.
- Exercises to strengthen joint and muscle.
- Ablation of the synovium using Yttrium Synoviorthesis (only at HCCC).

Procedure for Synoviorthesis:

- To prevent cycle of bleeding commence secondary prophylaxis
- Raise Factor level to 50% prior to procedure
- Give Factor daily x 3 days thereafter
- Intra-articular injection of local anesthetic and steroids given at the same time
- Immobilize for 3 days

Management of the Haemophilia Carrier and Pregnancy

- Check haemophilia carrier baseline Factor level
- Symptomatic carriers managed according to severity of symptoms
- May be treated with DDAVP, Tranexamic acid or Factor replacement

- Level done to establish bleeding risk
- Symptomatic carriers should wear MedicAlert® bracelets
- Menorrhagia can be controlled using hormonal, haemostatic or surgical methods

Pre- Pregnancy

- Provide pre - pregnancy genetic counselling to all carriers
- Establish gene abnormality

At Pregnancy

- Take family and personal bleeding history
- Plan management with obstetrician and haematologist
- Measure Factor level at 28 and 34 weeks
- If bleeding do not use DDAVP

- If not sure of carriers status check sex of fetus

At delivery

- Plan for vaginal delivery
- Avoid scalp monitor
- Avoid vacuum and forceps
- Take cord blood for Factor levels
- Avoid heel pricks
- Give oral Vit K
- If bleed use Factor replacement

- Watch for bleeding in mother and child
- FIX assay unreliable in new born

Post Partum

- Watch for post partum bleeding
- Treat with Factor replacement or DDAVP

- Factor levels fall to baseline in first week

Genetics

Genetic testing for haemophilia A and B is important for:

- Definitive carrier testing
- Prenatal counselling and testing

Definitive carrier testing:

All females who are at risk of being haemophilia carriers (mother, sisters, maternal aunts and maternal aunts' daughters of a person with haemophilia) should be offered genetic counselling and testing, so that their carrier status can be determined definitively. This can be done in early childhood, so that pre-emptive management is possible, but with appropriate consent and genetic counselling.

- Females who are shown to be carriers or high-risk can then be managed appropriately for bleeding complications
- Females who are non-carriers or at low risk would be at very low risk of bleeding complications

Prenatal counselling and testing:

Females who are shown to be carriers or high-risk should be offered genetic counselling when they reach child-bearing age to discuss their risks and options for prenatal testing and pregnancy management

Genetic testing

- Is complex
- May be done by direct mutation analysis or gene tracking (linked marker) analysis
- May require blood samples from a number of family members (including unaffected individuals)
- Consult with a Genetics Centre to determine from which family members samples are required

Prophylaxis

- Primary prophylaxis is aimed at stopping spontaneous bleeds in people who have severe haemophilia
- Secondary prophylaxis is given when there is a high requirement for on demand treatment
- Single dose prophylaxis is given prior to an event known to cause bleeding

- Rationale for prophylaxis is to maintain Factor activity above 1% converting a bleeding pattern from severe to mild / moderate
- Target joints are a high requirement and secondary prophylaxis is used

Treatment

- Haemophilia A :
  give 25 - 40 IU/kg
  2 - 3 times per week
- Haemophilia B:
  give 25 - 40 IU/kg
  twice per week

Management of Pain in Haemophilia

- The most effective pain management is early appropriate Factor replacement.

- Avoid giving analgesic agents for every bleed

Pain may be caused by

- Joint capsular stretching as a result of haemarthroses
- Haemophilia arthropathy
- Compartment syndrome

- Aim to relieve pain without risk of bleeding

Treatment

- COX-2 inhibitors are favoured due to favourable side effects, good analgesic effects, anti- inflammatory and anti angiogenic effects

- Other agents know to relieve pain without increasing bleeding risk are:
  - opiates
  - paracetamol.

- Aspirin and other antiplatelet agents must be avoided

- Analgesia requiring intra muscular injections must be avoided

TREATMENT OF BLEEDING EPISODES

Factor VIII Treatment Guidelines

Refer to page 23 for the products available in South Africa

- **Always refer to the Haemophilia Treatment Centre physician's instructions**
- **Treatment products may change: always read the package insert**
- **Patients with inhibitors require special treatment**

Factor VIII replacement for Haemophilia A, no inhibitor

Dose depends on bleeding severity
Minor bleed: 20 - 40 IU/kg
Major bleed: 40 - 50 IU/kg

Expected response: 1 IU/kg = 2% rise in Factor VIII level

Half life Factor VIII: 8-12 hr

For serious bleeding **Factor VIII assay** may be required to monitor the response to the infusion.

If there is no response to appropriate replacement therapy, test for inhibitors.

- **The Haemophilia Treatment Centre** physician chooses the most suitable product for each patient. Please follow these recommendations.
- **Plasma-derived Factor VIII** is treated with heat or solvent/detergent to inactivate viruses.
- **Round off** dose to the nearest vial; do not discard excess Factor VIII but rather infuse it.
- **Repeat doses** may be required depending upon the severity of bleeding: always needed for major bleeds every 12 - 24 hours.

Factor IX Treatment Guidelines

Refer to page 24 for the products available in South Africa

- **Always refer to the Haemophilia Treatment Centre physician's instructions**
- **Treatment products may change: always read the package insert**
- **Patients with inhibitors require special treatment**

Factor IX replacement for Haemophilia B, no inhibitor

Dose depends on bleeding severity

Minor bleed: 20 - 40 IU/kg

Major bleed: 60 - 80 IU/kg

Expected response: 1 IU/kg = 1% rise in Factor IX level

Half life Factor IX: 16-24 hr

For serious bleeding **Factor IX assay** may be required to monitor the response to the infusion.

If there is no response appropriate replacement therapy, test for inhibitors.

- **The Haemophilia Treatment Centre** physician chooses the most suitable product for each patient. Please follow these recommendations.
- **Plasma-derived Factor IX** concentrates are treated with solvent/detergent to inactivate viruses.
- **Factor IX Complex [Prothrombin complex concentrate (PCC)]** also contain Factors II, VII and X (can reverse the effects of warfarin).
- NB: thrombosis or disseminated intravascular coagulation may occur with frequent or large doses of PCC.

Factor VIII or IX Inhibitor Management Options

Refer to page 24 for the products available in South Africa

Haemophilia A

1. Acute bleeding episodes

Ice/cold pack - 5 minutes on, 10 minutes off
Immobilise joint with a splint

Low Responder (< 5 BU)

- Give Factor VIII at 2 - 3 times the normal dose
- Monitor response clinically
- Frequent factor recovery levels

High Responder (> 5 BU)

Both APCC and rVIIa are effective for treatment of acute bleeding episodes in patients with Factor VIII inhibitors.

- **Activated Prothromibin Complex Concentrate (APCC)**
  Dose: 50 - 100 IU/kg q12 - 24h for 3 days or until clinical improvement
  Infuse at 2 IU/kg/min
  Do not exceed a single dose of 200 IU/kg
  - **Do not** use antifibrinolytic drugs (e.g. tranexamic acid) concurrently because of the risk of thromboembolism
- **Recombinant Factor VIIa (rFVIIa)**
  90 μg per kg q2 - 3 h or by continuous infusion (at 20 μg/kg/hr) until clinical improvement. Factor VIIa activates Factor X and leads to the formation of a haemostatic plug.
  New single dose of 270 μg/kg may be used
- **Tranexamic acid** 15 - 25 mg/kg/dose po/IV q6- 8h may be used concurrently with recombinant Factor VIIa.

2. Long term Management - Immune tolerance (IT)

- IT should be initiated at a Haemophilia Treatment Centre.
- Successful therapy (eliminating the inhibitor) may take months.
- Several regimens are effective - the Dutch regime
  (25 IU Factor VIII/kg 3 times per week) is the most affordable.

Haemophilia B

Treatment of haemophilia B with inhibitors

- An aPCC should be carefully monitored for anaphylaxis and anamnestic reaction. Therefore patients with haemophilia B and inhibitors are best treated with rFVIIa, the only bypassing agent that does not contain FIX.
- There is no evidence to guide tolerisation procedures in patients with haemophilia B and inhibitors. Plasma-derived FIX may be used for tolerisation with careful monitoring of anaphylactic reactions

Treatment with rFVIIa:

- Give dose of 90 - 120 μg/kg IV every 2 - 3 hours as bolus or 20 IU/kg/hour as continuous infusion. Single dose of 270 μg/kg may be used.
- Antifibrinolytic can be given concurrently with rFVIIa.

Rehabilitation Exercises After Joint or Muscle Bleeds

Rehabilitation after a bleed is essential to maintain strength and range of motion.

When to start rehabilitation exercises?

As soon as the pain is gone.

What exercises?

1. Static exercise.
2. 3 days after resolution of the bleed:
   free active exercises where the only resistance is gravity.
3. 10 days after the resolution of the bleed:
   weight bearing exercises to build up muscle strength and bulk.

Hepatitis

- Any person with haemophilia and related bleeding disorders may have transfusion acquired infection.
  - Test annually for HAV, HBV, HCV.
  - Antibody/antigen negative patients should be immunised, and response assessed.
  - Active infection should be excluded in positive patients.
  - Patients with chronic active hepatitis should be referred to a Hepatologist for management.

NB: Patients with hepatic dysfunction may have other Factor deficiencies (test PT or INR) or a low platelet count.

Treatment Guidelines for Other Products

Do not give aspirin

- Aspirin impairs platelet function which may compound an existing bleeding disorder.

Tranexamic acid
(see package insert)
15-25 mg/kg/dose po/IV q6 or 8 hr.

- Antifibrinolytic - prevents clot breakdown.
- Indicated for mucous membrane bleeding.
- Contraindicated in haematuria or with concurrent use of Factor IX complex, or activated PCC.

DDAVP

0.3 μg/kg IV in normal saline over 20-30 minutes
0.4 μg/kg SC

- Moderate or mild haemophilia A and von Willebrand disease.
- Releases stored Factor VIII and vWF into circulation.
- Less effective with lower baseline Factor VIII level.
- Tachyphylaxis may occur with repeat doses.

NB: Beware of fluid retention and syndrome of inappropriate ADH secretion
Monitor weight and baseline U+E
Restrict fluid as necessary

Childhood Immunisation

Following the injections:
press on area > 5 min.
Apply ice.
Subcutaneous injection is safer.

- Avoid other intramuscular injections in haemophilia.

Haemophilia Treatment Products Available in South Africa

Plasma-derived Factor VIII Products:

Product Name	Company	Contact Details
Haemosolvate Factor VIII	National Bioproducts Institute NPC	Ronnie Ramphal 031 714 6700 083 229 5339
Virally Inactivated Factor VIII	Western Province Blood Transfusion Service	021 507 6300

Factor IX Complex Products (Prothrombin Complex Concentrates [PCC]):

Product Name	Company	Contact Details
Haemosolvex Factor IX	National Bioproducts Institute NPC	Ronnie Ramphal 031 714 6700 083 229 5339

Activated Prothrombin Complex Concentrate (APCC):

Product Name	Company	Contact Details
FEIBA	Adcock Ingram Critical Care	Janine Blackensee 011 494 8496 076 538 6532

Recombinant Factor VIIa:

Product Name	Company	Contact Details
NovoSeven	Novo Nordisk	Piletso Maniza 083 255 8299

Recombinant Factor VIII:

Product Name	Company	Contact Details
Kogenate FS Antihaemophilic Factor 250 IU, 500 IU, 1000 IU	Bayer Schering Pharma	Tracey Tingle 011 921 5633 082 324 9211

HAEMOPHILIA INFORMATION

Individuals with haemophilia and their physicians should be advised by a Comprehensive Haemophilia Treatment Centre staffed by a multidisciplinary team consisting of a Haematologist or Physician, Paediatrician, Nurse, Geneticist, Physiotherapist, orthopaedic surgeon, dentist, pharmacist and laboratory scientist, who are skilled in the care of this uncommon bleeding disorder.

Haemophilia Treatment Centres and Haemophilia Treaters

Contact person	Hospital	Phone
Johannesburg		
Prof M Patel (Adult)	Chris Hani Baragwanath	011 933 8368 072 437 4680
Dr V Philip	Chris Hani Baragwanath	011 933 8000 072 453 4878
Dr M Bassingwaithe (Paediatrics)	Chris Hani Baragwanath	011 933 9589 082 461 4696
Sr H Mbatha	Chris Hani Baragwanath	011 933 8234 078 964 0216
Sr T Manalo	Chris Hani Baragwanath	073 139 0134
Prof A Krause (Genetics)	Division of Human Genetics NHLS	011 489 9223 082 809 5797
Prof J Mahlangu	Charlotte Maxeke Johannesburg	083 644 5659
Sr B Mbele	Charlotte Maxeke Johannesburg	011 488 3294/5 082 210 0562
Dr R Schwyzer	Charlotte Maxeke Johannesburg	011 488 3294
Sr A Banze	Haemophilia Nurses Office	011 787 6710 082 896 3833

Haemophilia Treatment Centres and Haemophilia Treaters continued . . .

Contact person	Hospital	Phone
Pretoria		
Dr T Ngwane	Dr George Mukhari	082 978 1192
Sr V Sehube	Dr George Mukhari	083 734 1220
Dr J Rasesemola	Dr George Mukhari	082 719 2718
Dr A Adu (Adult)	Dr George Mukhari	072 435 3035
Sr H Nkomo	Dr George Mukhari	072 606 2603
Dr A Dlova	Dr George Mukhari	071 414 6857
Dr's Brittain & McDonald	Pretoria East Hospital	012 993 2555
		084 566 0838
Sr T Mnguni	Steve Biko Academic	012 354 2251
		078 418 1432
Dr J C Opperman	Steve Biko Academic	012 354 5274
		072 288 0890
Dr J Potgieter	Steve Biko Academic	012 319 2543
		082 371 2666
R De Beer (Physiotherapy)	Steve Biko Academic	012 354 1645
		082 655 4625
Sr K Hill	Steve Biko Academic	072 673 4675
Cape Town		
Dr G Bellairs	WPBTS	021 507 6318/9
Sr AL Cruickshank	Groote Schuur	082 788 1038
Dr C Du Toit	Groote Schuur	021 404 3084/77
Dr M Du Toit	Constantiaberg Medi-Clinic	082 416 0024
Dr M Hendricks	Red Cross Children's	021 658 5272
		021 658 5185
Mr S Rahim (Physiotherapy)	Red Cross Children's	021 658 5033
		084 578 6684
Prof C Karabus	Red Cross Children's	083 894 0234

Haemophilia Treatment Centres and Haemophilia Treaters continued . . .

Contact person	Hospital	Phone
Cape Town continued		
Dr A Van Zyl (Paediatrics)	Tygerberg	021 938 4560 082 372 8622
Tygerberg Paediatric Ward	Tygerberg	021 938 4564
Dr G Sissolak (Adult)	Tygerberg	072 795 0828
Dr F Bassa (Adult)	Tygerberg	083 231 4766
Sr S Daniels	Tygerberg	021 938 5888
George		
Sr M Rothman	George Provincial	044 802 4408 083 329 9199
Dr W Breytenbach	George Provincial	083 232 2324
Port Elizabeth		
Heidi Khoza	Livingstone NHLS	041 4082229
Dr N Littleton	PE Provincial	041 392 3535/6
Sr S Jantjies	PE Provincial	084 480 8788
Sr N Tuswa	Dora Nginza	041 406 4244 084 255 0397
East London		
Dr R Mathew	Frere	043 709 2511 083 381 5541
Sr L Poyo	Frere	043 709 2124 083 245 0085
Dr D Fleitas	Frere	082 822 1579
Sr E Syce	Frere	083 558 0084

Haemophilia Treatment Centres and Haemophilia Treaters continued . . .

Contact person	Hospital	Phone
Mthatha		
Sr G Mdali	Nelson Mandela Academic	078 631 0769
Sr F Ncapai	Nelson Mandela Academic	073 201 6217
Prof N Tonjeni	Nelson Mandela Academic	083 378 0801
Queenstown		
Prof Targonsky	Frontier	073 390 0589
Sr P Ndungane	Frontier	045 808 4315
		083 361 8756
Durban		
Haemophilia Clinic	King Edward VIII	031 360 3680
Dr N Rapiti	King Edward VIII	083 780 8877
		083 265 5248
Dr Y Goga	Inkosi Albert Luthuli	031 240 1536
		082 787 5786
Dr R Thejpal	Inkosi Albert Luthuli	082 562 4491
Dr B Neethling (Paediatrics)	Greys Hospital	084 402 5638
Dr Y Naidoo (Adult)	Greys Hospital	083 560 1139
Sr M Hemmero	Greys Hospital	033 386 3448
		072 798 9880
Sr S Ramgobin	Greys Hospital	076 360 7339
Dr Kalonda (Paediatrics)	Lower Umfolozi	083 280 1236
Sr J Mngadi	Lower Umfolozi	079 198 4375
Sr JC Methenjana	Lower Umfolozi	035 907 7190

Haemophilia Treatment Centres and Haemophilia Treaters continued . . .

Contact person	Hospital	Phone
Bloemfontein		
Prof M Coetzee	Universitas	051 405 3043/3069 082 550 1968
Prof D Stones	Universitas	051 405 2820
Polokwane		
Dr C Sutton	Polokwane (Pietersburg)	015 287 5043 082 800 6778
Sr Ledwaba	Polokwane (Pietersburg)	051 287 5195 082 331 4914
Sr F Kgopa	Polokwane (Pietersburg)	082 701 6465
North West		
Dr M Radebe	Potchefstroom	082 440 7760
Sr D Mofulatsi	Potchefstroom	018 297 7011 (ext 4529) 072 046 2034
Sr M Moloi	Mafikeng Provincial	018 383 2005 082 408 1332
Mpumalanga		
Dr M Terry	Rob Ferreira	072 499 4069
Sr J Tshabalala	Rob Ferreira	013 741 6212 076 657 6729

S A Haemophilia Foundations

Foundations	Phone
Johannesburg John Bradley	083 298 0970
Pretoria Marchaine Wright Julie Malan	082 418 8417 082 553 5891
Cape Town Bradley Rayner	021 781 0915 (h) 082 882 6420
Durban Wayne Fowles	082 321 0931
Limpopo Kedibone Kgwele	072 581 9259
Port Elizabeth Richard Johnson	041 583 3159
Operations Officer, SAHF Judy Butler	021 785 7140 083 711 7287

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