

MANUAL OF Emergency Care

**Department of Paediatrics
Lagos University Teaching Hospital (LUTH)**

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Table of Content

1.	Anaemia <i>Ireti Fajolu</i>	1
2.	Asthma <i>Babayemi Osinaike</i> <i>James Renner</i>	7
3.	Burns <i>Uche Nwachukwu</i> <i>Edamisan Temiye</i>	12
4.	Cardiopulmonary Resuscitation <i>Chinyere Uzodimma</i> <i>Christy Okoromah</i>	15
5.	Coma <i>Akinseye Akinsete</i> <i>Afolabi Lesi</i>	24
6.	Diabetic Ketoacidosis <i>Chinyere Uzodimma</i> <i>Abiola Oduwole</i>	28
7.	Heart Failure in Children <i>Ekanem Ekure</i>	33
8.	Hypertensive Crisis <i>Ekanem Ekure</i>	39

9.	Raised Intracranial Pressure	44
	<i>Adeseye Akinsete</i>	
	<i>Afolabi Lesi</i>	
10.	Newborn	46 - 82
	a. Acute Problems of Prematurity	46
	<i>Adeseye Akinsete</i>	
	<i>Edna Iroha</i>	
	b. Bleeding in the neonate	47
	<i>Ireti Fajolu</i>	
	<i>Mathias Egri-Okwaji</i>	
	c. Cyanosis in the newborn	54
	<i>Chinyere Uzodimma</i>	
	<i>Ekanem Ekure</i>	
	d. Neonatal Jaundice	58
	<i>Gbemi Boyede</i>	
	<i>Chinyere Ezeaka</i>	
	e. Pain	63
	<i>Christopher Esezobor</i>	
	f. Poisoning in children	68
	<i>Iranlowo Moyoloye</i>	
	<i>Adebola Akinsulie</i>	
	g. Respiratory distress	76
	<i>Christopher Esezobor</i>	
	<i>James Renner</i>	
	h. Shock	80
	<i>Uche Nwachukwu</i>	
	<i>Adebola Akinsulie</i>	
11.	Status Epilepticus	83
	<i>Gbemi Boyede</i>	
	<i>Afolabi Lesi</i>	
12.	Appendices	87 -165

Dedication

Dedicated to Prof Olikoye Ransome-Kuti 1927-2003- the first indigenous Head of Department of Paediatrics, Lagos University Teaching Hospital who conceptualized and set up the children's emergency room with the first set of guidelines for management.

Preface

Early disease recognition and institution of proper therapy is the key to ensuring survival of the children that come to us for care. The idea of the emergency manual arose from the desire to guide decision making in diagnosis and management of children that present in the Emergency Ward of the department of Paediatrics. Following this, a committee was set up to produce a manual with a format of definition, aetiology, signs and symptoms, investigations, treatment and references. Where possible, interventions were to be based on best available evidence which should be rated A (systematic review of RCT) to E (expert opinion).

This manual therefore represents the work of residents and consultants working in the Department of Paediatrics, Lagos University Teaching Hospital between 2009 and 2010. It is a small book to fit the white coat pocket of a resident and so can be used in the ward, clinic and anywhere else needed. There are larger, more detailed textbooks on the management in paediatrics but this manual focuses on emergency care of the patient. There are useful documents including growth charts, normograms, blood pressure charts among others in the appendices.

The topics chosen are those relevant to our tropical

environment. A different manual for the subspecialty units in the Department will focus on all other diseases we commonly see in those units.

The topics are arranged in alphabetical order with appendices at the end and are mainly for doctors and other health professionals working in hospitals that attend to children with emergencies.

It is hoped that this manual will standardize medical care, raise quality of care and reduce risk.

We are indebted to all the authors for their contributions towards the production of this manual

We are also grateful to Prof JK Renner for reviewing the manual for publication.

Finally we acknowledge WHO for kindly granting us permission to reproduce the materials on the practical procedures from their publication.

Ekanem Ekure
Christopher Esezobor
Babayemi Osinaike
2013

Foreword

Having a manual to guide doctors in the care of patients continues in the long tradition of such publications such as the Harriet Lane handbook. Indeed, the publication of this manual serves as an opportunity to review current practice in light of new knowledge. It is recognized that efforts such as this goes a long way in standardizing practice, and ultimately improving the quality of care of our patients. In this era where clinical practice is carefully audited and patients become more litigation conscious, the need to have this publication becomes essential. It will also help protect the integrity of the patient-doctor interaction, especially in a high tension environment such as our children's emergency room. Historically, in this Department, some of the older staff will remember a typed document on foolscap paper edited by the late Professor Olikoye Ransome-Kuti, which served as a guide to medical students and house officers. Unfortunately, it was never updated and it quickly became outdated.

This manual represents months of collective hard work involving critically appraising the evidence and consensus opinion of experts where hard medical evidence was lacking or weak. We had chosen to start with conditions commonly seen in the children's emergency room with a view that in no distant future we should be able to have a manual for all common conditions seen in a busy tertiary centre.

I commend Dr. Ekanem Ekure and her committee for putting this manual together. Appreciation also goes to the printers for a professional and elegantly done job. Our expectation is that this manual will be used always.

Dr. Adebola Akinsulie

Professor and Head of Department.

Heart Failure In Children

Working Definition:

Heart failure is a syndrome which occurs when cardiac output is insufficient to meet the metabolic demands of the body.

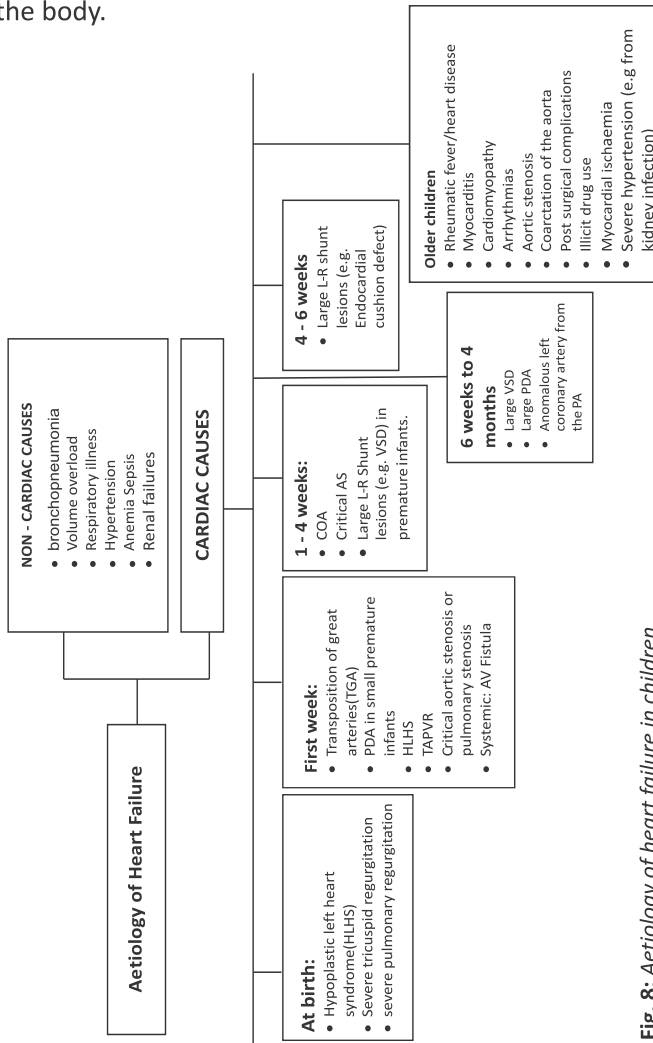


Fig. 8: Aetiology of heart failure in children

Clinical Manifestations/presenting complains

Characteristic signs are respiratory distress, exercise intolerance and growth failure (if chronic).

Presenting complaints

Infancy: Poor feeding, tachypnoea, poor weight gain and cold sweat on the forehead.

Older children: shortness of breath especially with activity, easy fatigability, puffy eyelids or swollen feet.

Physical findings:

- Compensatory responses to impaired cardiac function
- Tachycardia (heart rate >160/minute in a child under 12 months old; >120/minute in a child aged 12 months to 5 years), gallop rhythm, weak and thread pulse and cardiomegaly.
- Signs of increased sympathetic discharges
- Growth failure, perspiration and cold wet skin.
- Signs of pulmonary venous congestion (left sided failure) Tachypnea, dyspnoea on exertion, poor feeding in small infants, orthopnea in older children, wheezing and pulmonary rales.
- Signs of systemic venous congestion (right-sided failure)
 - Hepatomegaly, Ascites, Pleural effusion, facial puffiness or pedal oedema, distended neck veins. Distended neck veins and ankle oedema are not seen in infants
- Severe pallor may be present if severe anaemia is the cause of the heart failure.

CLINICAL WORK UP

Thorough history taking and physical examination, including an assessment of the upper-extremity and lower-extremity blood pressures is required.

Table 3: *The Modified Ross Score*

The Modified Ross Score Score (Points)			
	0	1	2
<i>History</i>			
Diaphoresis	Head only	Head and body during exercise	Head and body at rest
Tachypnoea	Rare	Several times	Frequent
<i>Physical examination</i>			
Breathing	Normal	Retractions	Dyspnoea
<i>Respiratory rate (respirations/min)</i>			
0-1y	<50	50-50	>60
1-6y	<35	35-45	>45
7-10y	<25	25-35	>35
11-14y	<18	18-28	>28
<i>Heart rate (beats/min)</i>			
0-1y	<160	160-170	>170
1-6y	<105	105-115	>115
7-10y	<90	90-100	>100
11-14y	<80	80-90	>90
<i>Hepatomegaly (liver edge from right costal margin)</i>	<2cm	2-3 cm	>3cm
Scores can range from 0 (no heart failure) to 12 (severe heart failure)			

Classification

Use Modified Ross Heart Failure Classification for Children

Modified Ross Heart Failure Classification for Children

Class I	Asymptomatic
Class II	Mild tachypnea or diaphoresis with feeding in infants Dyspnea on exertion in older children
Class III	Marked tachypnea or diaphoresis with feeding in infants Marked dyspnea on exertion Prolonged feeding times with growth failure
Class IV	Symptoms such as tachypnea, retractions, grunting, or diaphoresis at rest

IV Symptoms such as tachypnea, retractions, grunting, or diaphoresis at rest.

Investigations

O₂ saturation, CBC, CXR, ECG, Echocardiography, EUCr, LFT, N-terminal pro-BNP assay, exercise testing (for patients with arrhythmia or aortic stenosis)

Treatment**Supportive**

- Avoid the use of IV fluids, where possible. If necessary give 2/3 of maintenance dose.
- Support the child in a semi-seated position with head and shoulders elevated and lower limbs dependent (cardiac position).

- Give oxygen if the child has tachypnoea – respiratory rate above (<2 months old: 60 breaths/min; aged 2–11 months: 50 breaths/min; aged 1–5 years: 40 breaths/min), shows signs of respiratory distress, or has central cyanosis.
- Give Subcut morphine sulphate 0.1-0.2mg/kg/dose 4hourly in severe cases associated with restlessness despite oxygen therapy.
- Relieve fever with paracetamol to reduce the cardiac workload.
- Blood transfusion if PCV is <36% for acyanotic heart lesions and <45 for cyanotic congenital heart lesions

Medical therapy

1. **Diuretics** - Give furosemide- 1mg/kg/dose PO or IV – May increase to qid.
2. **Digoxin** –
Total Digitalizing dose (TDD) and maintenance doses in mcg/kg/24hour.

Table 4.

Digoxin Digitalizing and Maintenance Dose				
Age	Total Digitalizing dose		Daily maintenance	
	PO	IV/IM	PO	IV/IM
Premature	20	15	5	3-4
Full term	30	20	8-10	6-8
<2years	40-50	30-40	10-12	7.5-9
2-10years	30-40	20-30	8-10	6-8
>10years and <100kg	10-15	8-12	2.5-5	2-3

Initial: ½ TDD, then ¼ Q8-18hr x 2doses;

Maintenance dose:

<10yr: Give maintenance bd.

≥10yr: Give maintenance daily.

1. Dopamine – (more effective in raising systemic BP without undue tachycardia in the newborn) - 5-20mcg/kg/min IV. Gradually titrate upward to desired effect.

OR

Dobutamine - 2.5-15mcg/kg/min continuous IV infusion.

2. Captopril – newborn- 0.1-1.4mg/kg/day PO divided 1-4 times daily.
Infant – 0.5-0.6mg/kg/day PO divided 1-4 times daily.
Child – 12.5mg/dose 1-2 times daily.

3. Carvedilol -0.2 to 0.4 mg/kg orally every 12 hours (maximum dose: 25 mg orally every 12 hours). Especially if patient has dilated cardiomyopathy. Contraindicated in asthma patients. Initiate with lower dose and gradually increase dose q2-3wk to therapeutic range

Reference

1. Hsu DT, Pearson GD. Heart Failure in Children: Part II: Diagnosis, Treatment, and Future Directions *Circ Heart Fail* 2009; 2:490-498
2. Rosenthal D, Chrisant MR, Edens E, International Society for Heart and Lung Transplantation: Practice guidelines for management of heart failure in children. *J Heart Lung Transplant*. 2004; 23:1313-33. heart failure. *Paediatr Drugs*. 2006; 8:55– 69.
3. Ross RD, Bollinger RO, Pinsky WW. Grading the severity of congestive heart failure in infants. *Pediatr Cardiol*. 1992;13:72–75.