OPTIMIZED SUPPORTIVE CARE FOR EBOLA VIRUS DISEASE (EVD)

Advancing care for the patient with EVD

- Important advances have been made in the care of patients with EVD
  - Identification of organ dysfunction as a driver of mortality
  - Optimized supportive care to maintain organ function and prevent complications
  - Daily chemistries and hematology as clinically indicated
  - Establish a safe foundation of care and monitoring for therapeutic interventions
- Advances in care must be available to all
  - A single standard of care

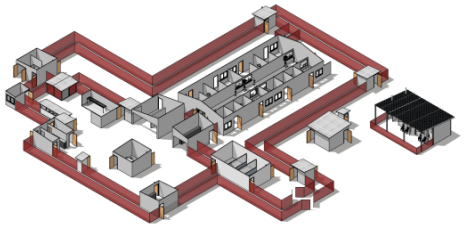

C4
C5
ALIMA
WHO
OMS
NRB
MEDECINS SANS FRONTIERES
NRB
International
World Health Organization
THE ALLIANCE FOR INTERNATIONAL MEDICAL ACTION
ALIMA

Evolution of Patient-centered Care in EVD

Safe and Effective Care for Ebola Virus Disease

Patient Centered Biosecure Treatment Facility

A place where patients can receive safe and effective care



Optimized Supportive Care for Ebola Virus Disease

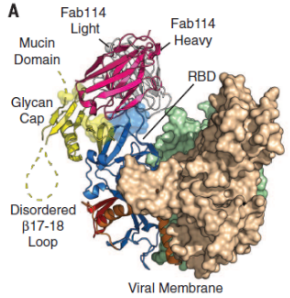
Oxygen and diagnostics Systematic assessment and reassessment Hemodynamic resuscitation Prevention and management of complications

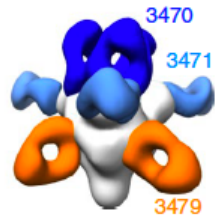
Therapeutics

Thanks to scientific research, new virus specific therapies are available

Inmazeb(REGN-EB3)

ansuvimab(mAB114, Ebanga)





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HEALTH EMERGENCIES programme

Source: Janet Diaz (WHO Case Management), draft only

Organ-specific Complications in Ebola Virus Disease

Delirium/confusion/coma **5-33%**

Seizures **4-11%**

→ 1. Direct viral injury
2. Hypoglycemia?
3. Medications

Hypoxia **3-52%**

Tachypnea **?-25%**

Mechanical ventilation **26-33%**

→ 1. Fluid resuscitation?
2. Acidosis

Vasopressors **?-30%**

Arrhythmia/EKG changes **?-41%**

→ 1. Fluid responsive?
2. Potassium/Mg?

Characteristic	Survivors (n = 16)	Nonsurvivors (n = 6)	*P* Value[a]
Laboratory values during stay, mean (SD)			
Maximum INR	1.1 (0.3)	4.4 (2.2)	<.001

→ 1. DIC?
2. Hepatic dysfunction?

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Bah, EI NEJM 2014; Hunt, L. LID 2015; Lanini, S JCI 2015; Schieffelin, J.NEJM 2015; Uyeki, T et al NEJM 2016, Ndambi R JID1999

HEALTH EMERGENCIES programme

Optimized Supportive Care for Ebola Virus Disease

oSOC

- Assessment for high risk features
- Fluid resuscitation
- Hypoglycemia
- Electrolyte management
- Treatment of potential co-infections
- Nutrition
- Symptomatic care
- Prevention and Management of Complications
- Psychosocial and palliative care

Optimized Supportive Care for Ebola Virus Disease

CLINICAL MANAGEMENT STANDARD OPERATING PROCEDURES

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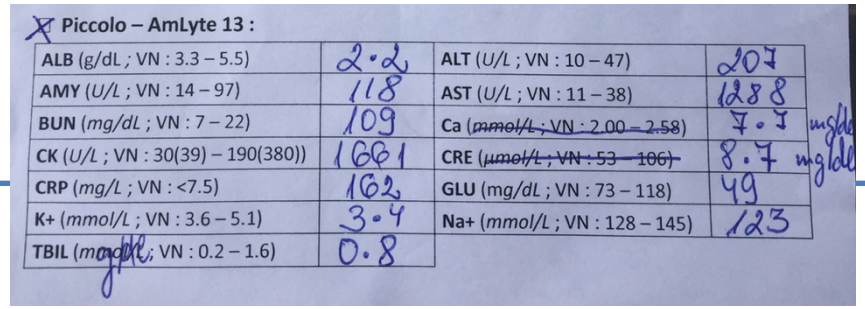

~~Piccolo – AmLyte 13 :~~

ALB (g/dL ; VN : 3.3 – 5.5)	2·2	ALT (U/L ; VN : 10 – 47)	207
AMY (U/L ; VN : 14 – 97)	118	AST (U/L ; VN : 11 – 38)	1288
BUN (mg/dL ; VN : 7 – 22)	109	Ca (~~mmol/L ; VN : 2.00 – 2.58~~)	7·5 mg/dl
CK (U/L ; VN : 30(39) – 190(380))	1661	CRE (~~µmol/L ; VN : 53 – 106~~)	8.7 mg/dl
CRP (mg/L ; VN : <7.5)	162	GLU (mg/dL ; VN : 73 – 118)	49
K+ (mmol/L ; VN : 3.6 – 5.1)	3·4	Na+ (mmol/L ; VN : 128 – 145)	123
TBIL (mg/dL ; VN : 0.2 – 1.6)	0.8		

Daily assessment checklist

Assessment	Plan
1. Is the patient at high risk of complications? a. Airway obstruction or respiratory distress? b. Tachypnea (RR > 22 or fast for age) or SpO_2 < 92%? c. Shock? Hypotension, weak or rapid pulse, cold extremities or delayed capillary refill? d. Signs of severe dehydration? e. Altered mentation or seizure? f. Oliguria or anuria, urine output < 0.5 (adult)/1.0 ml (child)/kg/hour? g. Haemorrhagic manifestations? h. Severe hypoglycaemia (glucose < 54 mg/dl or < 3 mmol/l)? i. Severe electrolyte abnormalities? j. Severe weakness with inability to ambulate or eat/drink?	❑ NOT at high risk Regular assessments – three times a day ❑ HIGH risk Increased interval of assessments: _____ ❑ Plan:_____
2. Fluid status assessment a. Able to drink normally? b. Able to drink some but not enough to correct dehydration or meet daily fluid requirements? c. Signs of sepsis or shock (HR > 90, SBP < 100, RR > 22). And for child: cold extremities, weak fast pulse, delayed capillary refill > 3 sec?	❑ Continue with oral fluids ❑ Add maintenance fluids ❑ Bolus IV fluids: _____ml
3. Laboratory assessment a. Does potassium or magnesium need to be replaced? b. Is renal failure present? i. If yes, has the patient been adequately fluid resuscitated? ii. Is a urinary catheter needed to monitor urine output?	❑ Replace potassium ❑ Replace magnesium ❑ Place a urinary catheter ❑ Use ultrasounds to assess fluid status
4. Severe hypoglycaemia a. Evidence of hypoglycaemia (glucose < 54 mg/dl or < 3 mmol/l)? i. If yes, are they symptomatic and require D50 or D10? ii. If no, are they able to eat and drink or do they require continuous infusion of D5 or D10?	❑ Euglycaemic ❑ D50 (adult) or D10 (child) for symptomatic hypoglycaemia ❑ D5 or D10 for asymptomatic hypoglycaemia
5. Treatment of potential bacterial co-infections a. Is the patient at high risk of co-infections? i. If yes, is the patient being treated with ceftriaxone? ii. If no, is the patient being treated with cefixime? b. Does the patient still need to be treated with antibiotics?	❑ Ceftriaxone ❑ Cefixime ❑ Antibiotics discontinued
6. Treatment of potential malaria a. Does the patient have signs of severe malaria? i. If yes, is the patient being treated with artesunate? ii. If no, is the patient being treated with an antimalarial medication? b. Can the antimalarials be stopped due to a negative malaria test?	❑ Artesunate ❑ Artesunate-amodiaquine (ASAQ) ❑ Malaria negative ❑ Malaria treatment completed
7. Nutrition a. Is the patient able to eat and drink? i. If yes, can maintenance fluids be stopped?	❑ Able to eat and drink ❑ NOT able to eat and drink and requires maintenance fluids
8. Prevention a. Can the IV line be removed? b. Can the urinary catheter be removed? c. Does the patient require assistance walking or can they walk on their own?	Remove IV line ❑ Yes ❑ No Remove urinary catheter ❑ Yes ❑ No Patient requires assistance walking ❑ Yes ❑ No
9. Is the patient a pregnant woman? a. Is she having an abortion? Premature birth? Has she had an	Date of last menstrual period:

Checklist: is the patient at high risk?

Daily assessment checklist

Assessment	Plan
1. Is the patient at high risk of complications? a. Airway obstruction or respiratory distress? b. Tachypnea (RR > 22 or fast for age) or SpO_2 < 92%? c. Shock? Hypotension, weak or rapid pulse, cold extremities or delayed capillary refill? d. Signs of severe dehydration? e. Altered mentation or seizure? f. Oliguria or anuria, urine output < 0.5 (adult)/1.0 ml (child)/kg/hour? g. Haemorrhagic manifestations? h. Severe hypoglycaemia (glucose < 54 mg/dl or < 3 mmol/l)? i. Severe electrolyte abnormalities? j. Severe weakness with inability to ambulate or eat/drink?	❑ NOT at high risk Regular assessments – three times a day ❑ HIGH risk Increased interval of assessments: _____ ❑ Plan:_____

Checklist (II)

2. Fluid status assessment a. Able to drink normally? b. Able to drink some but not enough to correct dehydration or meet daily fluid requirements? c. Signs of sepsis or shock (HR > 90, SBP < 100, RR > 22). And for child: cold extremities, weak fast pulse, delayed capillary refill > 3 sec?	❑ Continue with oral fluids ❑ Add maintenance fluids ❑ Bolus IV fluids: _____ml
3. Laboratory assessment a. Does potassium or magnesium need to be replaced? b. Is renal failure present? i. If yes, has the patient been adequately fluid resuscitated? ii. Is a urinary catheter needed to monitor urine output?	❑ Replace potassium ❑ Replace magnesium ❑ Place a urinary catheter ❑ Use ultrasounds to assess fluid status

Checklist (III)

4. Severe hypoglycaemia a. Evidence of hypoglycaemia (glucose < 54 mg/dl or < 3 mmol/l)? i. If yes, are they symptomatic and require D50 or D10? ii. If no, are they able to eat and drink or do they require continuous infusion of D5 or D10?	❑ Euglycaemic ❑ D50 (adult) or D10 (child) for symptomatic hypoglycaemia ❑ D5 or D10 for asymptomatic hypoglycaemia
5. Treatment of potential bacterial co-infections a. Is the patient at high risk of co-infections? i. If yes, is the patient being treated with ceftriaxone? ii. If no, is the patient being treated with cefixime? b. Does the patient still need to be treated with antibiotics?	❑ Ceftriaxone ❑ Cefixime ❑ Antibiotics discontinued
6. Treatment of potential malaria a. Does the patient have signs of severe malaria? i. If yes, is the patient being treated with artesunate? ii. If no, is the patient being treated with an antimalarial medication? b. Can the antimalarials be stopped due to a negative malaria test?	❑ Artesunate ❑ Artesunate-amodiaquine (ASAQ) ❑ Malaria negative ❑ Malaria treatment completed

Checklist (IV)

7. Nutrition a. Is the patient able to eat and drink? i. If yes, can maintenance fluids be stopped?	❑ Able to eat and drink ❑ NOT able to eat and drink and requires maintenance fluids
8. Prevention a. Can the IV line be removed? b. Can the urinary catheter be removed? c. Does the patient require assistance walking or can they walk on their own?	Remove IV line ❑ Yes ❑ No Remove urinary catheter ❑ Yes ❑ No Patient requires assistance walking ❑ Yes ❑ No
9. Is the patient a pregnant woman? a. Is she having an abortion? Premature birth? Has she had an incomplete abortion? If no, is the fetus viable?	Date of last menstrual period: _____ Echo: _____ Plan: _____

Summary

- Ensure appropriate staff and equipment are available to monitor appropriately
- Monitor-record-respond-re-assess patient often
- Critically ill patients are monitored frequently (**at least every hour**) because of their dynamic clinical condition and need for timely (and titrated) resuscitation and intensive interventions.
- When patients fail to respond to treatments or deteriorate, use a systematic approach to interpret data and modify the treatment plan in a timely manner.