



Inpatient feeding for children with complicated Severe Acute Malnutrition: audit of Ready-to-Use Food vs. F100 milk in transition phase

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Background (1)

- Severe Acute Malnutrition (SAM) is a global public health priority
 - At least 1-2 million child deaths / year
- (New) treatment approaches – Community Management of Acute Malnutrition:
 - High coverage
 - Active case-finding
 - Early treatment



Background (2)



F100 milk

Evolution of Therapeutic foods



RUTF



Background (3)

Classification of SAM:

with complications

Uncomplicated

Inpatient stabilization

Outpatient therapeutic feeds

Ref: Collins & Yates, Lancet 2003



Background (4) – Feeding protocols

Traditional inpatient NRU	Stabilization (F75 milk)	Transition (F100 milk)	Transition (F100 milk)	Rehabilitation (F100 milk)	---	Rehabilitation (F100 milk)	Rehabilitation (F100 milk)
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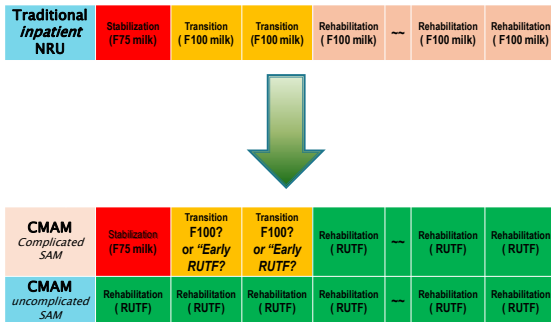
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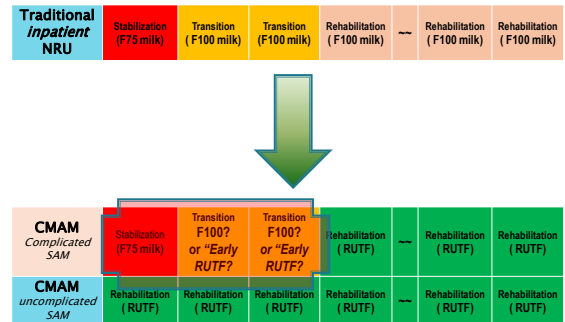


CMAM uncomplicated SAM	Rehabilitation (RUTF)	Rehabilitation (RUTF)	Rehabilitation (RUTF)	Rehabilitation (RUTF)	---	Rehabilitation (RUTF)	Rehabilitation (RUTF)
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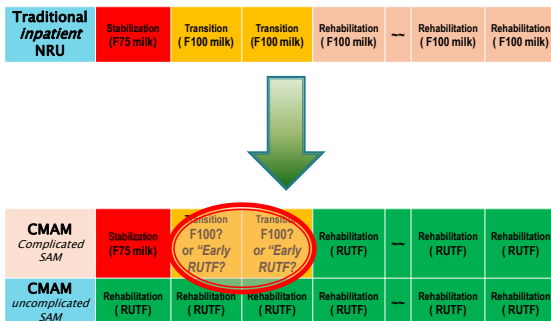
Background (4) – Feeding protocols



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Objective

- ▶ To explore whether "early RUTF" for **inpatient treatment of complicated SAM** is:
 - Effective (reduced inpatient stay)
 - Safe
-compared to "traditional F100" transition phase feeds



Methods

DESIGN

- ▶ Operational research (audit)
- ▶ 'Early RUTF' – prospective, during a negative RCT (Lancet 09)
- ▶ 'F100 milk' controls – historical routine ward data

SETTING

- ▶ "Moyo" child nutrition ward, Malawi
 - University Teaching hospital
 - Serves Blantyre district - urban & rural
 - Hybrid inpatient / outpatient treatment



Methods

PATIENTS

- ▶ All admitted children

'early' RUTF

Apr-06



Methods

PATIENTS

- ▶ All admitted children



'early' RUTF



Apr-06 May-06 Jun-06 Jul-06 Aug-06 Sep-06 Oct-06 Nov-06 Dec-06 Jan-07 Feb-07 Mar-07



Methods

PATIENTS

- ▶ All admitted children



'early' RUTF



F100 in transition phase historical control

Apr-06 May-06 Jun-06 Jul-06 Aug-06 Sep-06 Oct-06 Nov-06 Dec-06 Jan-07 Feb-07 Mar-07



Results (1) - Baseline characteristics

	F100 (2005-6)	Early RUTF (2006-7)
Patients	1173	1024
Age in months (mean)	28.8	28.9
Kwashiorkor (%)	69%	69%
HIV % seropositive	31% (23% unknown)	44% (11% unknown)
Weight-for-height (mean z-score, NCHS)	-2.32	-2.25
Weight-for-age (mean z-score, NCHS)	-3.61	-3.59
Height-for-age (mean z-score, NCHS)	-3.19	-3.24

Results (2) - Mortality

	F100 (2005-6)	Early RUTF (2006-7)
Patients	1173	1024
Died as inpatient	224 (19%)	238 (23%)
<i>Of all deaths, how many were:</i>		
During stabilization	110 (49%)	106 (45%)
During transitional phase feeds	56 (25%)	94 (39%)
During 'Phase2' inpatient feeds	58 (26%)	38 (16%)

Results (3) – Mortality – logistic regression

	Crude OR	aOR*	P-value
RUTF in Transitional phase	1.28 (1.04 to 1.57)	1.76 (1.30 to 2.39)	<0.01
HIV positive	4.10 (3.10 to 5.42)	2.56 (1.79 to 3.67)	<0.01
Admission WHZ	0.58 (0.53 to 0.64)	0.62 (0.54 to 0.71)	<0.01
Age	0.99 (0.99 to 1.00)	0.99 (0.98 to 1.00)	0.02
Oedema	0.40 (0.33 to 0.50)	0.74 (0.53 to 1.04)	0.08
Days stabilization	1.04 (0.99 to 1.10)	1.06 (0.99 to 1.13)	0.08

*Adjusted for HIV, WHZ, age, oedema, days stabilization

Results (4) – Length of stay on ward

	F100 (2005-6)	Early RUTF (2006-7)	P-value
Patients	1173	1024	
Mean length of stay (days)	9.0 ± 6.0	8.2 ± 5.3	<0.01
Total bed days	10,482	8,258	



Discussion

LOW-GRADE / HYPOTHESIS-GENERATING STUDY:

- ▶ Significant advantage of "Early RUTF" re length of stay:
 - ▶ Carer preference → Early presentation
 - ▶ Patient advantage → ↓ Infection (Nosocomial / Cross)
 - ▶ Staff advantage → ↓ Crowding on wards

BUT...

- ▶ Vital to explain the mortality observation...
 - ▶ REAL?
 - Carbohydrate load effect with increased diarrhoea?
 - Iron content in RUTF?
 - ▶ UNKNOWN CONFOUNDING?
 - ▶ BIAS? (routine vs study-period data / case-mix)
 - ▶ CHANCE?



Implications & Recommendations

- 1) Further analysis of MOYO data (next slides)
 - Post 2008 data
 - Casenotes audit
- 2) Analysis of data from other centres

3) INTERVENTION STUDIES

Test hypotheses generated by the observational data:

→ RCT testing:

- F100 vs RUTF in transition
- Standard vs low carbohydrate load in F75



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Further analysis

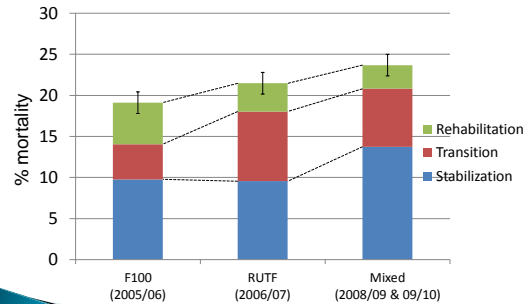
- Excluding <6m and >60m
- Excluding complicated MAM
- Wider time period
- Admission episodes rather than patients

	OR	aOR	p-value (aOR)
Early RUTF (vs F100)	1.37 (1.05 - 1.77)	1.31 (0.99 - 1.74)	0.053

*Adjusted for HIV status, WHZ, oedema, age



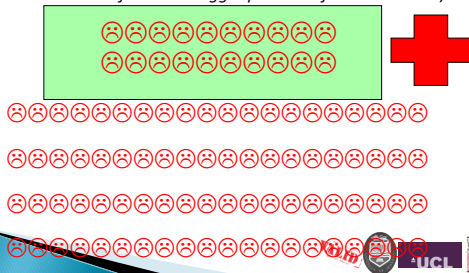
Akahane MSc – UCL: feed phase at death



Implications & Recommendations

INTERVENTION STUDIES

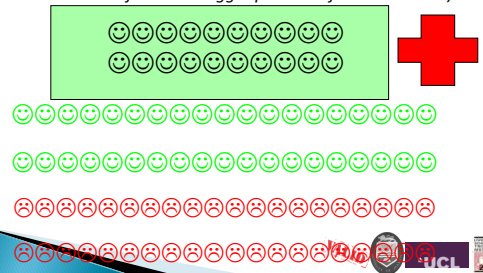
(but also continue focus on "bigger picture" of CMAM rollout)



Implications & Recommendations

INTERVENTION STUDIES

(but also continue focus on "bigger picture" of CMAM rollout)



Acknowledgements

- ▶ The patients, families and staff of MOYO nutrition ward, Malawi.
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THANK YOU

