



Immediate KMC improves survival in LBW infants



**World Health
Organization**

Department of Maternal, Newborn, Child and Adolescent Health, and Ageing

WHO immediate KMC study group

WORLD HEALTH ORGANIZATION COORDINATION & TECHNICAL SUPPORT

Rajiv Bahl*
Suman Rao*
Sachiyo Yoshida
Nicole Minckas

GHANA, KUMASI:

Sam Newton*
Gyikua Plange-Rhule*
Roderick Larsen-Reindorf

TANZANIA, DAR ES SALAAM:

Augustine Massawe*
Helga Naburi*
Matilda Ngarina

INDIA, DELHI:

Harish Chellani*
Sugandha Arya*
Pratima Mittal
Nitya Wadhwa

MALAWI, BLANTYRE:

Kondwani Kawaza*
Queen Dube*
Luis Gadama

NIGERIA, ILE-IFE:

Ebunoluwa Adejuyigbe*
Oluwafemi Kuti*
Chineme Henry Anyabolu

SWEDEN AND NORWAY INTERVENTION SUPPORT:

Bjorn Westrup*
Nils Bergman*
Siren Rettedal
Agnes Linnér

* Study Coordinator/
Principal investigators

Global burden of LBW

- ▶ Every year **20 million** (~15% of all births) infants are born with LBW
- ▶ **>95%** are in LMICs
- ▶ Account for **70-80%** of all neonatal deaths
- ▶ LBW infants are also at increased risk of **early growth retardation** and **developmental delay**



Kangaroo Mother Care – current WHO recommendations



KMC is recommended in health facilities for the routine care of newborns weighing **2000g or less at birth.**



Brief sessions of KMC should be initiated when clinical condition begins to **stabilize.**



As close to **continuous KMC** as possible should be provided when **clinically stable**

Kangaroo Mother Care – Cochrane review 2016

40% reduction
in neonatal mortality

65% reduction
in sepsis

58% reduction in hospital
readmission in infancy

72% reduction
in hypothermia

Improved exclusive
breastfeeding at 1-2 months

88% reduction
in hypoglycemia

Improved weight gain, length
and head circumference

Rationale for the Immediate KMC Trial

1

Studies included in Cochrane mortality review: mean age of randomization **~3 days** (range 10 h to 24.5 d)

2

About half of preterm deaths occur in first 24h, **over three quarters** in the first week

3

Thus, majority of preterm deaths occur before KMC can be initiated as per current guidelines



Research question

Does continuous KMC initiated immediately after birth (immediate KMC) compared with current guidelines improve newborn survival?

KMC before stabilization

Two small studies in Vietnam and South Africa had shown that skin to skin contact started immediately after birth is safe and helps LBW babies stabilize faster

ACTA PÆDIATRICA
NURTURING THE CHILD

Acta Pædiatrica ISSN 0803-5253

REGULAR ARTICLE

Newly born low birthweight infants stabilise better in skin-to-skin contact than when separated from their mothers: a randomised controlled trial

Kim Chi Luong¹, Tien Long Nguyen^{1,2}, Duy Huong Huynh Thi², Henri P.O. Carrara³, Nils J. Bergman (nils@kangaroomothercare.com)^{4,5}

1.Tu Du Hospital, Ho Chi Minh City, Vietnam

2.University of Medicine and Pharmacy at Ho Chi Minh City (UMPH), Ho Chi Minh City, Vietnam

3.School of Public Health and Family Medicine, University of Cape Town, Cape Town, Western Cape, South Africa

4.Department of Human Biology, University of Cape Town, Cape Town, Western Cape, South Africa

5.Department of Paediatrics and Child Health, University of Cape Town, Cape Town, Western Cape, South Africa

Acta Pædiatr 93: 779–785. 2004

Taylor & Francis
healthsciences

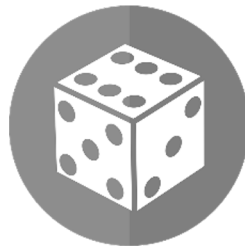
Randomized controlled trial of skin-to-skin contact from birth versus conventional incubator for physiological stabilization in 1200- to 2199-gram newborns

NJ Bergman¹, LL Linley^{1,2} and SR Fawcus^{1,3}

Mowbray Maternity Hospital¹, Mowbray; School of Child and Adolescent Health² and Department of Obstetrics and Gynecology³, University of Cape Town, Cape Town, South Africa



Immediate KMC study design



Randomized
Controlled Trial



Multi-country, multi-center

Referral hospitals in Ghana, India,
Malawi, Nigeria and Tanzania



Population

Mothers and babies,
if birth weight
1.0 to <1.8 kg



Intervention*

KMC initiated as soon
as possible after birth
by mother or surrogate



Control*

KMC initiated
only after baby
is stable

*Both groups received WHO minimum package for small babies

Immediate KMC study

Intervention group (n=1609)



As soon as possible after birth:
Continuous KMC in M-NICU



Throughout in M-NICU:
Continuous KMC



Baby stable:
Shifted to KMC ward:
Continuous KMC in KMC ward

Control group (n=1602)



After birth baby receives care in
warmer or incubator in NICU



In NICU: after baby starts
recovering, brief sessions of KMC



Baby stable:
Shifted to KMC ward:
Continuous KMC in KMC ward

Eligibility criteria

INCLUSION CRITERIA:



Livebirth with birth weight between 1.0 and <1.8 kg

Even if:

- 1) Twins (both babies allocated to the same group)
- 2) Babies born by caesarean section

EXCLUSION CRITERIA:

- Mother unable to provide consent
- Major maternal complications surely expected to preclude STS the first three days (e.g., eclampsia, shock, major surgery)
- Triplets and quadruplets
- Neonates unable to breathe spontaneously within 1 hour
- Congenital malformation that interferes with the intervention, or the intervention interferes with the required care.
- Place of residence outside the study area (defined to make 28-day follow up feasible)



Intervention

Three Components :

1

Continuous skin-to-skin contact with mother or surrogate starting within 2 hours of birth, aiming > 20 hours/day

2

Counselling and support for exclusive breastmilk feeding / breastfeeding

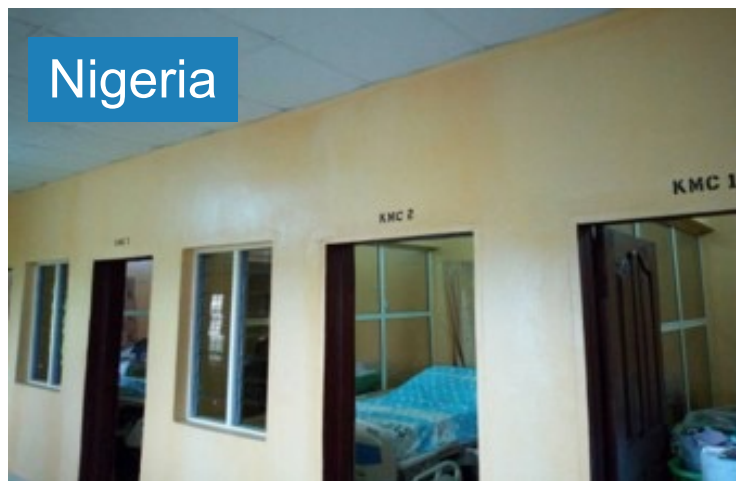
3

Provision of required medical care for mother and baby in STS contact without separation, as much as possible

New Mother–Newborn ICU



Part of NICU re-modelled to Mother–Newborn ICU



Provision of respiratory support with KMC



Mean duration of KMC
17 hours/day

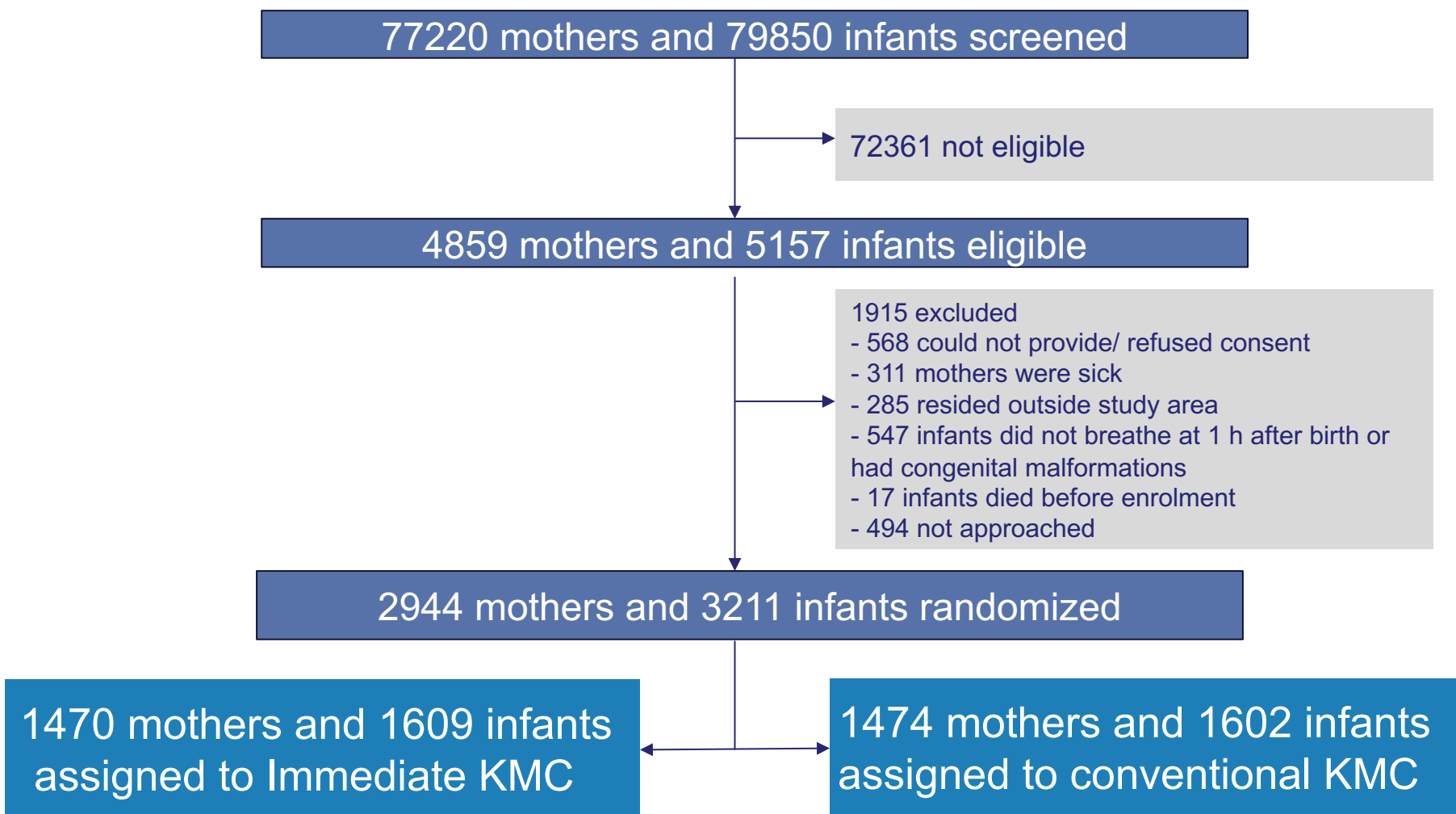


Control group: KMC after stabilization

Continuous KMC initiated after the baby is stable and shifted out of NICU



Results of the Immediate KMC Study: Participant flowchart



Characteristics of enrolled infants

	Immediate KMC	Control
	N=1609	N=1602
Age at randomization in minutes (median, IQR)	35 (20,55)	33 (20,54)
Birth weight in kg, mean (SD)	1.5 (0.2)	1.5 (0.2)
Gestational age at birth, mean (SD)*¥	32.6 (3.0)	32.6 (2.8)
Male, n (%)	752 (46.7)	748 (46.7)
Infants born as twin, n (%)	430 (26.7)	430 (26.8)
Delivery by C-section, n (%)	559 (34.7)	614 (38.3)
Respiratory distress in first 7 d of life, n(%)	691 (43.3)	705 (44.0)

Primary and Key Secondary Outcomes

Outcome	Intervention (N=1609)	Control (N=1602)	Risk Ratio, Hazard Ratio, or Difference (95% CI)†	P Value
Primary				
Death between enrollment and 28 days — no./total no. (%)	191/1596 (12.0)	249/1587 (15.7)	0.75 (0.64–0.89)	0.001
Death between enrollment and 72 hr after birth — no./total no. (%)	74/1606 (4.6)	92/1599 (5.8)	0.77 (0.58–1.04)	0.09
Secondary‡				
Hypothermia — no./total no. (%)§	90/1609 (5.6)	133/1602 (8.3)	0.65 (0.51–0.83)	
Suspected sepsis — no./total no. (%)**	361/1575 (22.9)	434/1561 (27.8)	0.82 (0.73–0.93)	

Other secondary outcomes

Outcome	Intervention (N=1609)	Control (N=1602)	Risk Ratio, Hazard Ratio, or Difference (95% CI) [†]
Secondary[‡]			
Exclusive breast-feeding at end of neonatal period — no./total no. (%)	1208/1401 (86.2)	1140/1336 (85.3)	1.01 (0.98–1.05)
Fully breast-fed (i.e., by suckling) at hospital discharge — no./total no. (%)	62/1435 (4.3)	55/1376 (4.0)	1.06 (0.73–1.53)
Median time to clinical stabilization — hr (IQR) [¶]	73.8 (26.8–138.5)	74.8 (25.3–140.6)	0.98 (0.90–1.07)
Hypoglycemia at any time between 0 and 36 hr after birth — no./total no. (%) ^{††}	82/799 (10.3)	66/651 (10.1)	1.15 (0.85–1.56)
Mean duration of hospital stay — days ^{‡‡}	14.9±0.2	15.2±0.2	1.07 (0.99–1.16)
Mean score for maternal satisfaction ^{§§}	9.2±1.0	9.1±1.2	0.11 (0.03–0.19) ^{¶¶}
Maternal depression — no./total no. (%)	2/1276 (0.2)	7/1231 (0.6)	0.23 (0.05–1.14)

^{||} Hazard ratio ^{¶¶} Mean difference

Additional breastfeeding indicators

Outcome	Intervention (n=1609)	Control (n=1602)	RR (95% CI)
Initiation of breastmilk feeds within 24 hr, n (%)	941 (58.5%)	729 (45.5%)	1.29 (1.20–1.37)
Infant put to breast before 72 hr of age, n (%)	1108 (68.9%)	832 (51.9%)	1.32 (1.24–1.41)
Age Infant first put to the breast in hr, median (IQR)	41 (21–83)	66 (36–138)	1.50 (1.40–1.62)*
Reached full breastmilk feeds within 7d, n (%)	1261 (78.4%)	1105 (69.0%)	1.14 (1.09–1.19)
Discharge on exclusive breastmilk feeding**, n (%)	1208 (93.1%)	1067 (88.7%)	1.05 (1.02–1.08)

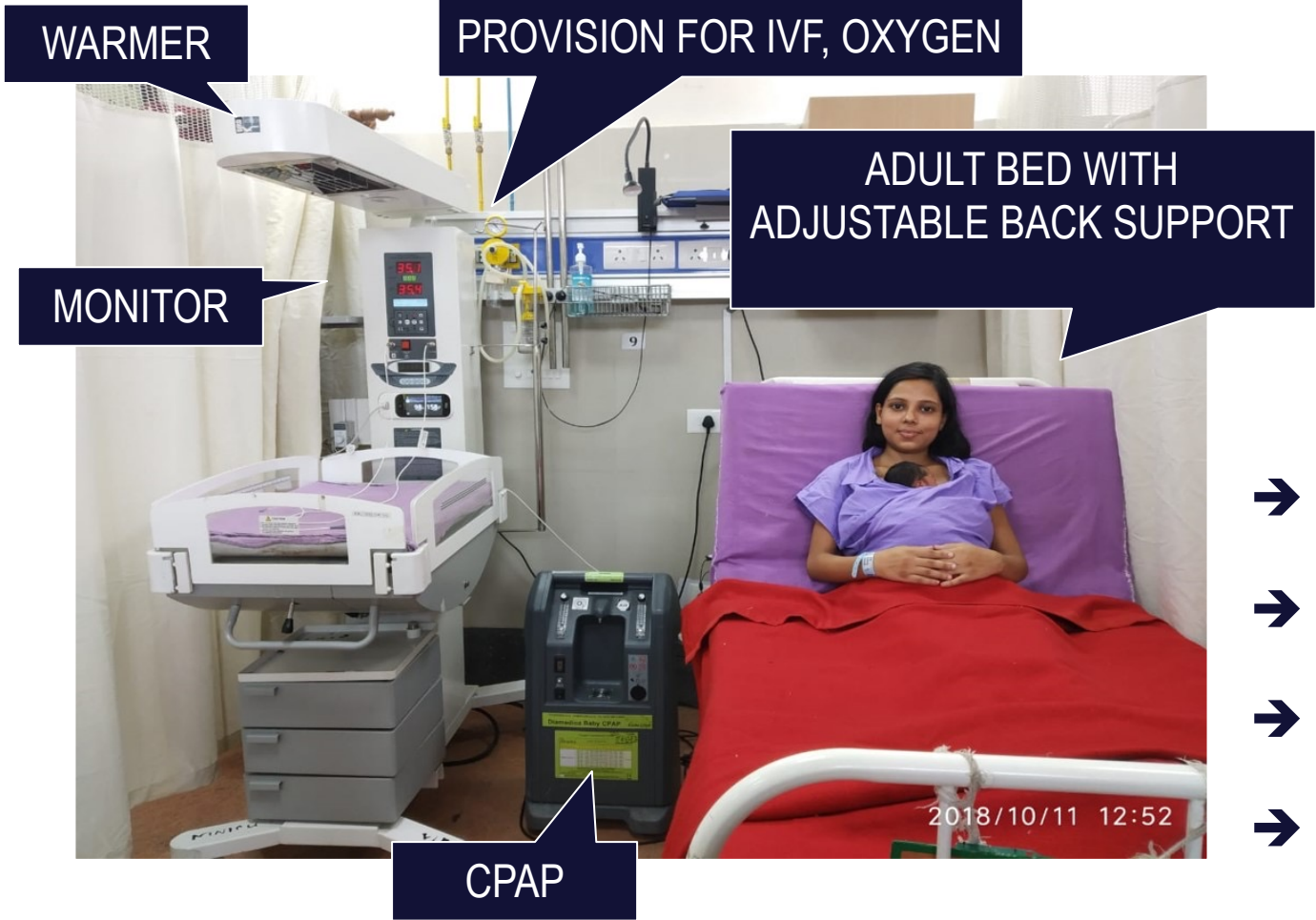
* Hazard ratio

** only among discharged infants (1298 intervention; 1203 control)

Cause-specific mortality

Cause of death	Intervention n= 1596	Control n= 1587	RR (95% CI)
Sepsis, n (%)	70 (4.4%)	109 (6.9%)	0.64 (0.48–0.86)
Preterm birth complications*, n (%)	79 (4.9%)	83 (5.2%)	0.95 (0.70–1.28)
Perinatal asphyxia, n (%)	12 (0.8%)	18 (1.1%)	0.66 (0.32–1.37)
Congenital malformation, n (%)	10 (0.6%)	10 (0.6%)	0.99 (0.42–2.38)
Other specific cause, n (%)	4 (0.3%)	5 (0.3%)	0.80 (0.21–2.96)
Sudden death, n (%)	16 (1.0%)	20 (1.3%)	0.80 (0.41–1.53)
Undetermined, n (%)	0	4 (0.3%)	-

M- NICU



- Hand hygiene area
- Pantry
- Washing area
- Infection control

Implications: System Changes

POLICY

to permit Mother & surrogate in NICU
24/7

M-NICU

to keep the mother and baby together
right from birth with zero separation

Revolutionize the way neonatal
intensive care is currently practiced



Conclusions

1

Immediate KMC for 1.0 and <1.8 kg infants significantly **reduces the risk of neonatal death by 25%**

2

Immediate KMC provided to every 27 babies saves a life which translates to **150,000 lives globally every year**

3

M – NICU is a paradigm shift in the care of the low birth weight infant weight



Thank you!



**World Health
Organization**

Department of Maternal, Newborn, Child and Adolescent Health, and Ageing