Return to Home Programme for High Risk Infants on oxygen therapy

Occupational Therapist will arrange on-site home visit within 2 weeks upon discharge to ensure parents are using home oxygen effectively and safely during daily activities of baby such as feeding and play...

Home sweet home! Mom & Dad, I love U!

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Background:

• Some preterm babies need supplementary oxygen to maintain optimal function and are able to return home earlier with home oxygen therapy (HOT).
METABOLIC AND PHYSIOLOGIC RESPONSES TO SEVERE ILLNESS

- **Physiologic**
  - Cardiovascular
    - Increased cardiac output
    - Peripheral vasodilation and capillary leak
    - Expansion of vascular compartment
  - Pulmonary
    - Increased minute ventilation
    - Ventilation-perfusion mismatch
    - Inefficient gas exchange
    - Increased CO2 responsiveness
  - Skeletal muscle
    - Easier fatigability
    - Slower relaxation
    - Altered force-frequency pattern
  - Renal
    - Salt and water retention
    - Impaired concentrating ability
- **Metabolic**
  - Hormone and hormone-like levels
    - Increased insulin
    - Increased glucocorticoids
    - Increased catecholamines
    - Increased interleukin-1
    - Increased tumor necrosis factor
  - Carbohydrate metabolism
    - Increased blood glucose
    - Increased gluconeogenesis
    - Increased glucose turnover
    - Glucose intolerance
  - Fat metabolism
    - Increased lipid turnover and utilization
    - Insuppressible lipolysis
    - Decreased ketogenesis
  - Protein metabolism
    - Increased muscle protein catabolism
    - Increased muscle branched-chain amino acid oxidation
    - Increased serum amino acids
    - Increased nitrogen losses
- **Respiratory**
  - Wheezing
  - Expiratory grunting
  - Decreased or absent breath sounds
  - Flaring of alae nasi
  - Retractions of chest wall
  - Tachypnea, bradypnea, or apnea
  - Cyanosis
- **General**
  - Fatigue
  - Sweating

Clinical features of respiratory failure

- **Respiratory**
  - Restlessness
  - Irritability
  - Headache
  - Confusion
  - Convulsions
  - Coma
- **Cardiac**
  - Bradycardia or excessive tachycardia
  - Hypotension or hypertension
RESPIRATORY PROBLEMS OF NEONATES

- birth asphyxia
- Premature
- intrauterine growth retardation

- required artificial ventilation
- Abnormalities on chest radiography
- thin ribs
- raised right hemidiaphragms
- Recurrent episodes of collapse
- consolidation of the lungs secondary to poor swallowing occurred in all ventilated babies

Premature Babies and Associated Sucking Problems

- If your baby is premature, you may notice that he has a combination of sucking issues. The most common are:
  - Disorganized or inefficient sucking patterns
  - Weakened lip seal
  - Impaired tongue shaping or movement
  - Weakened stability of the inner cheek
  - Trouble synchronizing the suck and swallow with breathing
  - Poor ability to awaken and to stay alert at the breast
  - Low control of posture
  - Irritability

One commonly seen complication in premature babies is Infant Respiratory Distress Syndrome (RDS). This can have an negative impact on feeding as well. Babies with RDS have difficulty synchronizing their sucking, swallowing, and breathing. They cannot withstand long feeds and tire easily. As a result, the baby does not have an adequate intake of nutrition.
Objectives:

• To review the existing Return to Home Programme (RTHP) for high risk infants (HRI) on HOT.

Design:

• This is a retrospective study on the outcome of HRI born from 2005 to 2009 based on the information from CDARS and documentation by Occupational Therapist (OT).
Methods:

• HRI of PMH received Occupational Therapy service in oral motor stimulation, feeding training, developmental assessment (DevAx) and training. HOT would be provided to those requiring supplementary oxygen. OT would provide titration of oxygen dosage, parent education, post discharge home visits and monthly follow-up on HOT.

• Out-patient DevAx would be arranged at corrected age 1, 6, 12, 18 months and annually from 2 to 6 years old to monitor the progress.

Result:

• Among the 303 HRI, 32 (10.5%) were discharged with HOT. The average length of hospital stay (LOS) was 134 days (59-395). The mean gestation and birth weight were 27.4 weeks and 857.8 grams respectively.
• The mean duration of HOT was 122.2 days. 16.7% and 28.6% of babies had age appropriate development in all aspects at corrected age 6 and 12 months.

• There was no direct correlation between diagnosis, LOS and dosage of HOT. 68% did not required readmission related to respiratory distress.
Conclusion:

- **Return to home programme was effective to support discharge of HRI back home and reduce LOS.**
- **Timely follow up to adjust oxygen dosage and developmental training was essential for HRI.**

**Cases with respiratory problems**

B/O CS / male
DOB : 31.1.2011
EDC : 27.4.2011
referred oral-motor feed & swallow Ax & training on 9.3.2011
Diagnosis

- preterm (27wk+ gestation),
- ELBW (0.855kg),
- IUGR, RDS in newborn,
- anaemia of prematurity
- feotal NNJ
- infection specific to the perinatal period
- feeding problem and abdominal distention

Before assessment and training

- Check alertness of baby and
- prepare a favour position
- check the airway and
- decide the level and flow of O2 supplement
upon assessment on 9.3.2001

1. on FiO2 at 21%, 1L/min through nasal cannula to maintain SaO2 at 95-96%
2. tone: NAD
3. gag reflex : +ve
4. Biting reflex : +ve
5. Rooting reflex : +/-
6. sucking : weak
7. tongue : flat
Performance after oro-facial stimulation

• responded to intra-oral stimulation,
  – able to develop minimal tongue grooving;
  – swallowing own saliva noted and
  – elicit lip closure

start oral-feeding training on 15.3.2011
as baby was ready for enteral feeding;
he has strong sucking force,
BW > 1.4kg and gestation > 34wk

• jaw support
• is needed to ensure efficient sucking
• intermittent rest; peri- and intra-oral
  stimulation is also needed
• after the first meal by mouth, baby may
  become exhausted
strategies used:

1) jaw support and peri-oral stimulation
2) intra-oral stimulation with loop

21.3.2011

• no need of incubator and oxygen
• care under room air and
• monitor with ECG and oximetry
• Parents started to learn how to feed baby and mother wanted to start direct breast feed.
Case 2
Wong YC / male
DOB : 26.4.2009
EDC : 16.8.2009
referred for High Risk Infant Programme
On 18.6.2009

Diagnosis

- G1P3, triplet 3
- Prematurity 24 wk
- IVF pregnancy
- ELBW  743g
- RDS/ PIE (Pulmonary Interstitial Oedema )
- Intubated
- NNJ
- BPD, on CPAP; $O_2$ required $Fi\ O_2$ 50-60%
  $\rightarrow$ nasal cannula with $Fi\ O_2$ 0.5 since D121
- IVH, bilateral ventricular dilatations
- No ROP but incomplete vascularization on D51
- ? hernia
Upon discharge from NICU

- Remain oxygen dependent
- No desaturation while on 1/8 L/min O₂ via nasal cannula; required higher level at ¼ L/min O₂ during feeding
- Oral feeding well on C22 neosure formula with satisfactory weight gain
- O₂ concentrator was arranged for home oxygen supplement after discharge;
- BW was 4.6 kg upon discharge

Home visit on 5.11.2009

- Within 2/52 upon discharge
- Ensure proper use and storage of O₂
- SaO₂ maintained at 88-97% during feeding and developmental assessment with 1/8 L/min O₂ supplement
- Cannot titrate down the level O₂
Growth curve – head circumference

Growth curve - height
Growth curve - weight

SaO₂ (%)
Overnight oximetry

Developmental performance

(month)
• Continue High Risk Infant Follow Up Programme for developmental assessment and parent guidance with home programme as the whole family is living in mainland;
• EETC service will be ready soon

HRIFU Programme

NICU → SCBU phase
• Oral stimulation to prepare for baby’s oral performance
• Oral feeding and developmental training
• Parent education in feeding and burping techniques; and how to get to know the baby observe the change of baby that is a pre-requisite of parent-child bonding;
• Pre-discharge meeting to explain the whole programme and arrange follow up in SOPD;
• Multidisciplinary pre-discharge meeting for complicated cases