NEO FOR NAMIBIA
HELPING BABIES SURVIVE

MISSION REPORT

Mission 2018 – 2

August 28, 2018 to September 27, 2018

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NEO FOR NAMIBIA
HELPING BABIES SURVIVE

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1. INTRODUCTION

Our 6th mission to Namibia lasted from August 28, 2018 to September 27, 2018 and, once again, brought us to the Rundu State Hospital. We were looking forward to meeting our colleagues and eager to learn whether the changes implemented during previous visits had been sustainable. Most of all, we were interested to further analyze the Prem Unit statistics: do our interventions really help babies survive?

In addition, at the request of the Health Minister of Namibia, Dr. Bernard Haufiku, we planned to visit a second hospital in the north of the country (Onandjokwe State Hospital) to assess the feasibility to expand our program.

We were also looking forward to providing a first field experience to Flurina Prevost, the vice-president of our organization NEO FOR NAMIBIA – Helping Babies Survive. She is an experienced pediatric nurse and has worked with Médecins Sans Frontières (MSF) in South Sudan. Marcel Bösch, a good friend, assistant and supporter of our organization once again decided to accompany us.

Our donors enabled us to bring vital medical equipment to Namibia. These donations are fundamental for our efforts. We take the opportunity to say a heart felt thank you to all of those who chose to support NEO FOR NAMIBIA – Helping Babies Survive in the past and hope that they will continue to do so in the future.

2. MAIN MISSION GOALS

To optimize the time spent in Namibia, we try to plan well ahead, communicate with members of the Ministry of Health and Social Services and local leaders; in addition, we set specific goals for the next mission.

The main mission goals were:

1. To bring additional and new Equipment to Rundu State Hospital
2. To continue our training at the bedside
3. To introduce Flurina Prevost to the local health care professionals
4. To monitor the use of respiratory support with CPAP (CPAP registry)
5. To assess the impact of the interventions of NEO FOR NAMIBIA - Helping Babies Survive
6. To visit Onandjokwe State Hospital and assess its neonatology services

3. EQUIPMENT

Based on the positive experience with the CPAP devices and pulse oximeters at Rundu State Hospital, we had arranged for the delivery of 3 additional Pumani® bubble-CPAP machines (including patient tubing and patient interfaces) (Fig. 1) and 5 Masimo® Rad-8 pulse oximeters and 200 sensors (Fig. 2).

Fig. 1. The new version of the Pumani® bubbleCPAP: the expiratory end of the patient tubing ends in the water bottle and the oxygen flow meter is adjustable.

Fig. 2. The Masimo® Rad-8 pulse oximeter has an integrated rechargeable battery pack (left); the neonatal sensors can be reused (the adhesive tape can be replaced with Coban® tape).

The Pumani® CPAP machines have undergone some slight modifications and now require a different set of patient tubing and careful adjustment of the oxygen flow meter to avoid pressure build up and detachment of the internal oxygen tubing. Short training sessions were therefore required to familiarize the staff with the new design (Fig. 1, 3).

Fig. 3. After short training sessions, the new Pumani® bubbleCPAP device was used to support babies with respiratory distress.

When we heard about the dramatic situation in Onandjokwe (see below), we decided to take 2 CPAP machines and 2 pulse oximeters to this hospital 450 km west of Rundu. Therefore, the Prem Unit at Rundu State Hospital is currently equipped with a total of 4 CPAP devices (3 bCPAP and 1 bubbleCPAP) and 8 pulse oximeters (5 battery-operated Rad-5 and 3 Rad-8 with rechargeable integrated battery packs).

To facilitate nasal cannula oxygen therapy, new oxygen flow meters were installed that allow low flow oxygen therapy. Unfortunately, some of the wall outlets are malfunctioning so that the new flow meters cannot be used at some bed sites.

Severe shortage of open warming units in the Prem Unit and the delivery rooms led us to order 3 MTTS Wallaby® Warmers, a moderately prized (USD 1900.00 / piece) simple piece of equipment that we hope will be durable (Fig. 4–6). This was further complemented by 5 MTTS LifeKit® infant beds (USD 400.00 / piece) and 2 MTTS Colibri® LED phototherapy units (USD 1200.00 / piece) (Fig. 7).

Fig. 4. Wallaby® warmers, LifeKit® infant beds and Colibri® phototherapy units had arrived at the Rundu State Hospital and were kept in the Dr. Mukerenge's office until our arrival.

Fig. 5. The Wallaby® warmers are assembled in front of the Prem Unit by the medical technician, Mr. Josiah Ndlovu, and his team.

Fig. 6. Mr. Josiah Ndlovu and his team will be responsible for the maintenance of the donated equipment.

Fig. 7. Wallaby® warmers, LifeKit® infant beds and Colibri® phototherapy units in the Prem Unit are ready for use.

Following staff training, one of the Wallaby® Warmers and one of the pulse oximeters were placed in the maternity ward where close to 5'000 babies are born annually (Fig. 8, 9). We emphasized that hypothermia must be avoided at all costs since it is known to increase both mortality and morbidity (Fig. 10). It is planned to register admission temperatures of all neonates who are brought to the Prem Unit to track any improvements.

Fig. 8. Wallaby® warmer and Masimo Rad-8 in one of the delivery rooms at Rundu State Hospital.

Fig. 9. The mid-wives were instructed on the proper use of pulse oximetry in the delivery room.

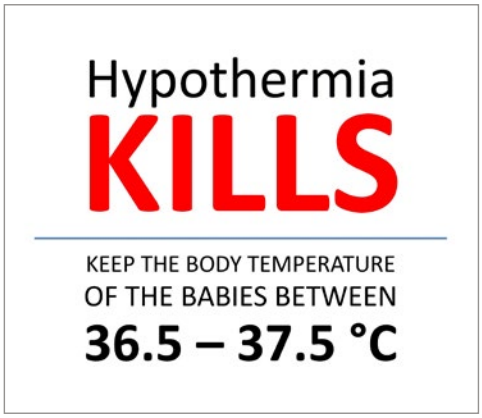

Fig. 10. Thermoregulation after delivery is extremely important: the new warming tables will be instrumental to avoid hypothermia.

Finally, we were able to bring intraosseous needles that work with the EZ-IO® drill and some training material (Fig. 11) This is a back-up system when intravenous access cannot be obtained in infants and older children in an emergency situation.

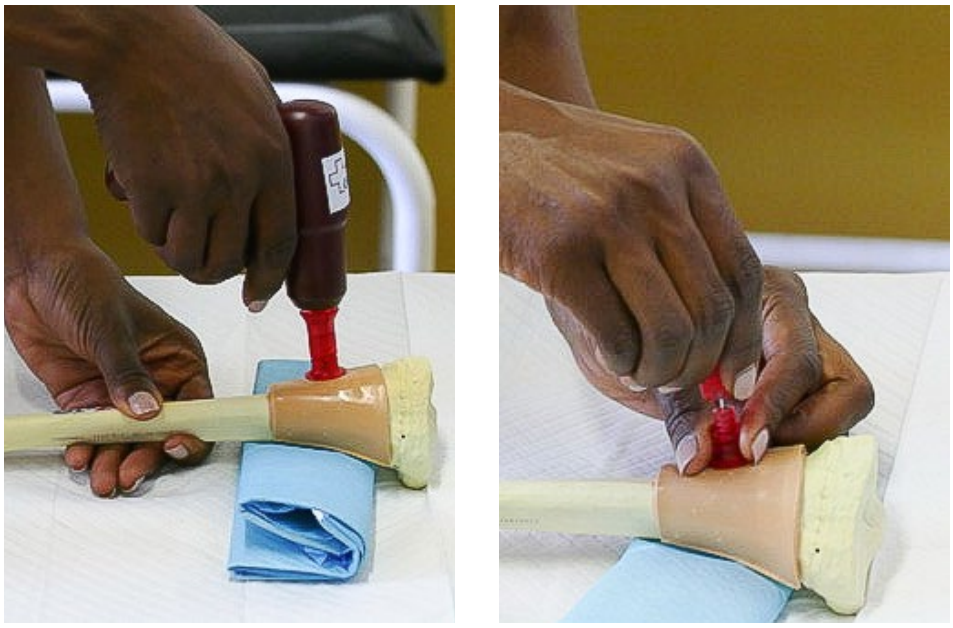

Fig. 11. Traning material to simulate the insertion of an intraosseous needle with the EZ-IO® device.

Overall, more than CHF 30'000.00 (approximately NAD 450'000.00) were invested for this mission by NEO FOR NAMIBIA – Helping Babies Survive to improve the hospital's infrastructure. We are convinced that this equipment will play an important role in our efforts to improve neonatal care at Rundu State Hospital. Further progress and sustainability will require additional funding which can only be obtained through increased funding efforts.

4. TRAINING

4.1 Formal educational sessions

Due to staff shortage at Rundu State Hospital, educational sessions were more restricted than during our last visits. We nevertheless managed to provide neonatal resuscitation training to the mid-wives and explain the use of the Wallaby® warming tables, the Colibri® phototherapy units and the modified Pumani® bubbleCPAP. Once again, the practical aspects of appropriate fluid and nutrition orders were discussed with the nurses (Fig. 12).

One Grand Round lecture was given on the impact of the interventions brought by NEO FOR NAMIBIA – Helping Babies Survive: a 50 % reduction in mortality rate has been achieved and maintained! During the same meeting, concerns regarding the performance of the Namibia Institute of Pathology, the admission of outborn babies to non-neonatal wards and the risks of rotating experienced staff out of the Prem Unit were deposited.

Fig. 12. Practical aspects of fluid and nutrition orders for preterm and term infants.

4.2 Bedside teaching

Upon our arrival at Rundu State Hospital, we learned that there was a significant shortage of physicians with only three pediatricians (Dr. Nyembo, Dr. Banza, Dr. Castro) remaining to cover all wards (Pediatric Ward, IV Unit, High Care Ward, Prem Unit, OPD, Casualty) and take calls.

Therefore, we decided to directly take care of the patients in the Prem Unit for our three-week-stay. This gave us the opportunity to work hand in hand with the nursing staff and get a detailed insight into their work and daily challenges (Fig. 13, 14). Bedside teaching of the nursing staff is very effective as the nurses are attentive and eager to learn (Fig. 15).

Fig. 13. Sabine Berger working hand in hand with the local nurses.

Fig. 14. Bedside teaching: dressing of an umbilical venous catheter.

Fig. 15. Prof. Berger on rounds with a stable very low birth weight infant (left); discussing a patient with a suspected syndromal disorder (right).

As pointed out in earlier Mission Reports, mothers are very involved in the care of their infants; however, when they are to ill after delivery, routine tasks (e.g., changing diapers, feeding, holding) are taken over by the nursing staff or one of the NEO FOR NAMIBIA – Helping Babies Survive team members (Fig. 16, 17).

Fig. 16. Flurina Prevost substituting for a mother who is still too ill to come to visit her baby.

Fig. 17. Marcel Bösch feeding a recovering baby with a syringe.

5. IMPACT ANALYSIS

Like in the past, we were trying to assess the impact of our interventions and whether any improvements had been sustainable. The analysis was based on a) the CPAP registry and b) the Prem Unit admission book.

5.1 CPAP registry data

Between August 2017 and September 2018, a total of 62 patients had been treated with CPAP. In recent months, the machines are used more frequently, very likely because the health care professionals have become more familiar with their use and a strategy of early CPAP use has been emphasized on our visit in April 2018 (Fig. 18).

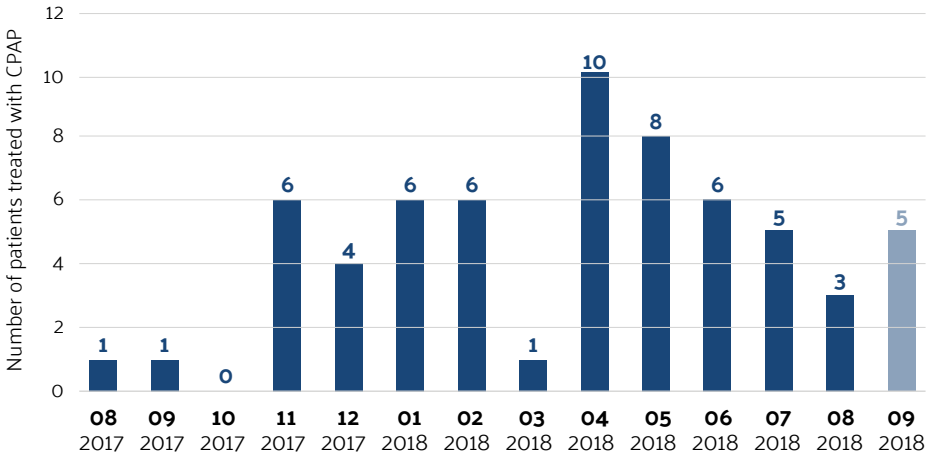

Fig. 18. Number of patients treated with CPAP in the Prem Unit at Rundu State Hospital (overall 62, corresponding to 12 % of all admitted babies) (Source: CPAP registry).

Patients undergoing CPAP therapy had a median birth weight of 1760 g (range 610 – 4170 g); gestational age estimates for these patients are unreliable. The median duration of CPAP support was 2.5 days (range 1 – 20 days); thus, a total of 210 CPAP days have been provided.

With 41 of the 62 CPAP patients surviving to discharge, the survival rate of 67 % is close to the 71 % observed by Kazawa et al. in their study from Malawi (1). Subgroup analyses and comparisons with the Kazawa study are shown in Table 1.

	Rundu State Hospital Rundu, Namibia	**Queen Elizabeth Central Hospital Blantyre, Malawi**
All birth weights	**62 67 % (n = 41)**	**62 71 % (44)**
Birth weight < 1500 g Survival rate	22 45 % (n = 10)	29 66 % (n = 19)
Birth weight 1500 – 2500 g Survival rate	27 81 % (n = 22)	24 67 % (n = 16)
Birth weight > 2500 g Survival rate	13 69 % (n = 9)	9 100 % (n = 9)

Table. 1. Comparison of outcomes of patients treated with CPAP at Rundu State Hospital (Rundu, Namibia) and at Queen Elizabeth Central Hospital (Blantyre, Malawi) (1).

It is noteworthy that survival rates of CPAP patients have increased over time: between July 2017 and March 2018, 13 of 25 patients (52 %) survived and between April 2018 and September 2018, 28 of 37 patients (76 %) survived. This is likely due to improved skills (i.e., learning curve) and adapted strategies (i.e., early CPAP versus rescue CPAP).

Unfortunately, outcome of extremely low birth weight (ELBW) infants (birth weight less than 1000 g) who are put on CPAP for respiratory distress remains poor with only 1/14 (14 %) infants surviving. Without the availability of surfactant replacement therapy and parenteral nutrition, the care of these patients will remain extremely challenging.

Due to lack of time, the precise causes of death could not be assessed; however, it is clear that some babies died from severe hypoxic-ischemic encephalopathy (HIE stage III) or sepsis rather than from primary lung disease.

5.2 Prem Unit admission book data

To better understand the long-term evolution of the Prem Unit at Rundu State Hospital, the admission books from 2012 to 2018 were analyzed. There was a steady and very significant increase in annual admissions from 260 in 2012 to 755 and 701 in 2016 and 2017, respectively (Fig. 19).

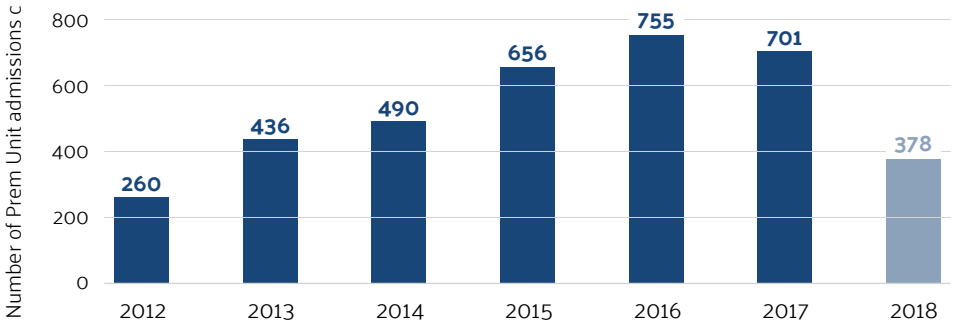

Fig. 19. Annual admissions to the Prem Unit at Rundu State Hospital (Source: Prem Unit admission book).

Prior to our first mission in 2015, the mortality rates ranged between 11.4 % and 18.6 %. Since then, mortality rates have decreased from 12.7 % (2015) to 11.0 % (2016) and then to 8.6 % (2017); for the current year (2018), the mortality rate has been 6.6 % (Fig. 20).

From this data and assuming an annual number of admissions of 750, one can extrapolate that changes implemented over the past three years will save on average 45 babies every year.

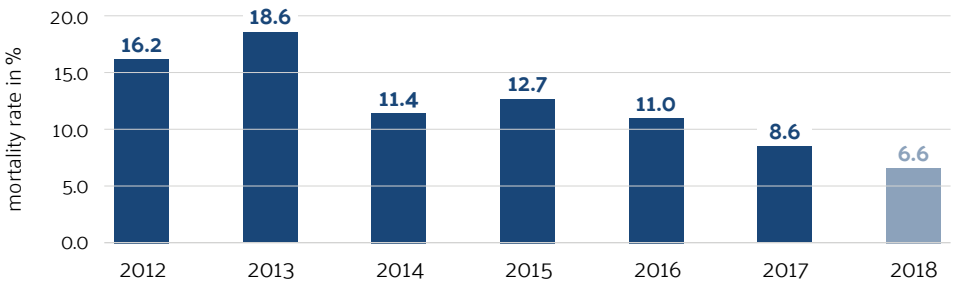

Fig. 20. Mortality rates of patients admitted to the Prem Unit at Rundu State Hospital from 2012–2018 (Source: Prem Unit admission book)

5.3 Sustained improvements in mortality rates

It is very gratifying to see that a package of relatively simple interventions has led to a 50% reduction of mortality rates of neonates admitted to the Prem Unit. NEO FOR NAMIBIA – Helping Babies Survive has contributed to this success by donating essential equipment, giving lectures on neonatal core topics and by training nurses and doctors at the bedside.

Sustainability of these improvements will require:

- appropriate maintenance of the medical equipment
- replacement of damaged equipment that cannot be repaired
- uninterrupted supply chain for consumables
- ongoing (re)-training of health care professionals
- improvement of the infrastructure (new Maternity & Prem Unit)
- retaining well trained and dedicated nurses and doctors
- adherence to implemented changes by all health care professionals (Table 2)

5.4 Limitations and future direction

While the data appears to be solid, detailed information is missing, and it will be necessary to improve data collection. In addition to the CPAP registry, a minimal neonatal data set (MNDS) should be put in place and data should be collected prospectively. It is planned that Prof. Berger will help to set up such a database in collaboration with Dr. Kamara and Dr. Mapanga. The same datasets could be used at Onandjokwe State Hospital (see below).

Finally, regular Morbidity and Mortality conferences should be organized to review and discuss complications and deaths. This will help to identify gaps and weaknesses in the system and may lead to further improvements in outcome.

Suggested changes	04/2018	09/2018
Obtaining daily weights in all infants in the Prem Unit	+++	+++
Introduction of minimal enteral nutrition	+	+++
Facilitating Kangaroo Mother Care	+	++
Using orogastric feeding tubes in infants with respiratory distress	+++	+++
Prone positioning of sick babies	++	++
Use of CRP values to guide antibiotic therapy	+	++
Improved documentation of respiratory support	+++	+++
Improved oxygen saturation monitoring	++	+++
Introduction CPAP	++	+++
Obtaining chest X-rays in infants with respiratory distress	+	++
Obtaining babygram after UVC insertion	++	+++

Suggested changes (continued)	04 / 2018	09 / 2018
Writing structured fluid and nutrition orders	++	++
Structured ward rounds with a uniform approach	+	+
Routine use of caffeine in preterm babies < 34 weeks of gestation	+++	+++
Prevention of hypothermia in the delivery room	-	-
Uninterrupted supply chains	+	+
Improved communication between OB / GYN and Pediatrics	-	-

Table. 2. Degree of adherence to suggested changes: comparison between April 2018 and September 2018: ongoing improvements (- not yet implemented; + used occasionally; ++ used commonly; +++ used almost universally).

6. ONANDJOKWE STATE HOSPITAL

After 3 weeks of uninterrupted work at Rundu State Hospital, we drove to Onandjokwe in the Oshikoto Region of Namibia, 450 km west of Rundu. We were warmly welcome at Onandjokwe State Hospital by Dr. Akutu Munyika (CMO), Dr. Sifelani Mtombeni (pediatrician) and Dr. Joy Shilongo (pediatric resident).

The Health Minister of Namibia, Dr. Bernard Haufiku, accompanied by the UNICEF representative of Namibia, personally introduced us to the hospital leadership. He praised the efforts of our organization and expressed an interest in supporting expansion of our program in Namibia. This was further acknowledged in letter we received after returning to Switzerland from the Permanent Secretary, Mr. Ben Nangombe (Fig. 21).

9-0/0001

REPUBLIC OF NAMIBIA

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OFFICE OF THE PERMANENT SECRETARY

Ref: 4/5/6/2
Enq: NE Amia

Date: 21 September 2018

Prof. Thomas M. Berger
Secretary and Chief Medical Advisor
NEO FOR NAMIBIA - Helping Babies Survive
Brambergstrasse 25
Luzern CH-6004
Switzerland

Dear Prof. Berger,

Re: Acceptance of donation from NEO FOR NAMIBIA to Rundu State Hospital

I write to acknowledge the receipt of assorted medical equipment and consumables that your organization donated to Rundu State Hospital.

On behalf of the Ministry, I wish to express my heartfelt gratitude for your kindness and generosity shown by way of this donation. I am extremely grateful for your invaluable support to the Ministry to improve quality of service delivery to the nation of Namibia. I assure you the items will be put to their intended use for the benefit of our clients.

It is my sincere hope that, this relationship and collaboration between your organization and the Ministry will continue to grow from strength to strength for the benefit of the nation of Namibia.

Yours Sincerely,

PERMANENT SECRETARY
MINISTRY OF HEALTH & SOCIAL SERVICES

MR. BEN NANGOMBE
PERMANENT SECRETARY

" Health for All "

Fig. 21. Letter from the Permanent Secretary, Mr. Ben Nangombe, emphasizing the interest in future collaborations.

6.1 Historical background and statistical information

This hospital was built in 1911 by the Finnish Missionary Society and operated by the Evangelical Lutheran Church in Namibia (ELCIN) via the Lutheran Medical Services until 2016, when the Government of Namibia took over. The hospital has 520 beds and more than 7'000 babies are delivered annually (i.e., an average of 20 deliveries per day); the Cesarean Section rate is 20 % (i.e., an average of 4 Cesarean Sections per day). In 2017, 1013 sick neonates were either admitted to the Prem Unit or the Intensive Care Unit (ICU), a 4-bed unit to cover all age groups.

6.2 Infrastructure and medical equipment

The hospital's infrastructure is in a very poor condition. Nevertheless, the health care professionals are interested in providing high quality care (Fig. 22–25). In the Prem Unit, which is located next to the Maternity Ward, there is very limited space for the many babies that require special care (Fig. 26).

Fig. 22. Relatives waiting outside of the Maternity Unit.

Fig. 23. A little girl, waiting outside of the Pediatric Ward to see her brother.

Fig. 24. In general, the hospital's infrastructure is in a very poor condition.

Fig. 25. Despite the difficult work conditions, the health care professionals are dedicated to provide good care.

Fig. 26. The Prem Unit at Onandjokwe State Hospital: very limited infrastructure (left) and poor working conditions for the nurses (right).

In the ICU, compressed medical air has become available at the beginning of 2018 and there are 2 Phoenix nasal CPAP machines to support babies with respiratory distress (Fig. 27, 28). During our visit, two babies had been treated with surfactant and were on invasive mechanical ventilation (Fig. 29). When looking closer at the ventilator, it became obvious that maintenance of the complex equipment is challenging: for example, calibration of the flow meters is not routinely done, and the displayed tidal volumes are completely unreliable.

Fig. 27. In the Intensive Care Unit, compressed air has become available in 2018 , allowing to operate Phoenix nasal CPAP Units 300 (from Phoenix Medical Systems, Chennai, India).

Fig. 28. The Phoenix nasal CPAP Unit 300 can only be operated if compressed medical air is available (left); it has a patient interface (right) that allows to put babies in prone position while on CPAP.

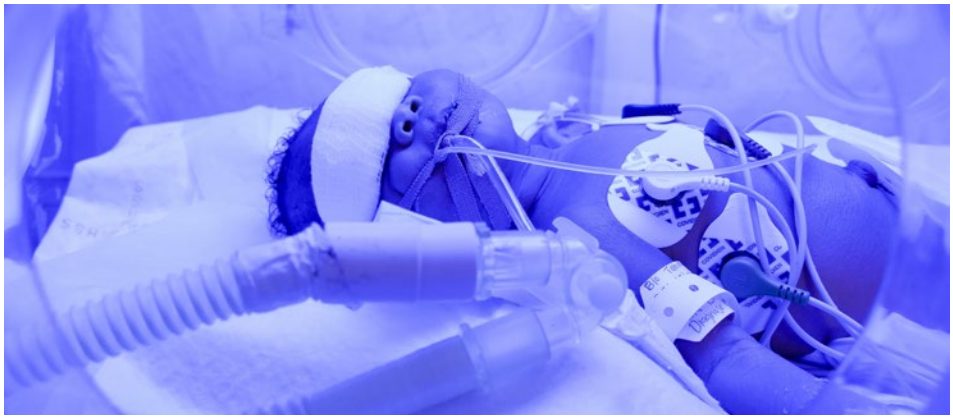

Fig. 29. At Onandjokwe State Hospital, some babies are put on invasive mechanical ventilation in the hospital's 4-bed ICU.

Our initial plan had been to visit Onandjokwe State Hospital to perform a first assessment only. However, when preparing our 6th mission to Namibia, we learned that the infrastructure of this hospital was very limited. Respiratory support beyond the administration of oxygen by nasal cannula can only be provided in a 4-bed intensive care unit that is used for adult, pediatric and neonatal patients. Given that 7'000 babies are born in the maternity ward of this hospital every year (Fig. 30, 31), this represents a critical shortage.

Fig. 30. At Onandjokwe State Hospital, 7'000 babies are born in this delivery room every year.

Fig. 31. The heating sources of the resuscitation tables are broken and cannot be repaired; there are no replacements in sight.

We therefore chose to introduce the Pumani® bubbleCPAP device and Masimo® Rad-8 pulse oximeters to this hospital. We were thrilled to see that they were put into action immediately (Fig. 32, 33).

Fig. 32. Shortly after we left, the doctors from Onandjokwe State Hospital sent us a picture of a 900 g baby on CPAP.

Fig. 33. The second CPAP device that we brought to Onandjokwe was used the next day for an infant with pneumonia (left); we were happy to hear that he made a quick recovery (right).

6.3 Training at Onandjokwe State Hospital

On our first visit to Onandjokwe State Hospital, we took the opportunity to give two formal lectures on neonatal adaptation and neonatal respiratory distress to the medical officers, interns and medical students. One three-hour workshop was organized for instructions on the use of the new equipment.

6.4 New Maternity Ward and a new Prem Unit

Together with the Health Minister and the hospital leadership, we were able to visit the construction site where a new Maternity Ward and a new Prem Unit are built (34, 35). The walls are up, but many details for the final construction of the new units still need to be discussed.

Fig. 34. Inspection of the construction site for a new Maternity Ward and a new Prem Unit (left: Marcel Bösch, Dr. Bernard Haufiku, Prof. Thomas M. Berger; right: the walls are up!).

Fig. 32. Inspection of the construction site for a new Maternity Ward and a new Prem Unit at Onandjokwe Hospital by the Health Minister of Namibia, Dr. Bernard Haufiku.

7. WINDHOEK CENTRAL HOSPITAL

During our stay at Rundu State Hospital, we had transferred 4 patients to Windhoek (one patient with congenital heart disease (Katutura Intermediate Hospital), one patient with a giant omphalocele, one patient with a large sacrococcygeal teratoma, and one very preterm infant (birth weight 1150 g) with suspected focal intestinal perforation or necrotizing enterocolitis). We were invited by Dr. Wim De Mey, in charge of the neonatal unit at Windhoek Central Hospital, to come and visit him and to get some follow-up information on the transferred patients.

Despite his busy schedule, Dr. De Mey was able to show us the large neonatal ward and give us an idea of what type of therapies can or cannot be offered at this hospital. Of note, the neonatal ward is critically understaffed and there are not pediatric surgeons available (the two patients with surgical conditions had not been operated yet and transfer to a private institution was considered) (Fig. 36, 37).

Fig. 36. Term baby with giant omphalocele (abdominal wall defect) is treated conservatively.

Fig. 37. Baby with a large, mostly cystic sacrococcygeal teratoma (left: clinical appearance; right: X-ray).

We were delighted to see the very low birth weight infant and meet her mother again (Fig. 38, 39). The baby had recovered slowly on broad-spectrum antibiotics and parenteral nutrition; fortunately, she had not required a surgical intervention.

Fig. 38. Prof. Berger examining the baby that had been transferred from Rundu State Hospital to Windhoek Central Hospital (750 km by ambulance) for specialized care.

Fig. 39. Fortunately, the very low birth weight baby (birth weight 1150 g) with suspected focal intestinal perforation or necrotizing enterocolitis had stabilized on broad-spectrum antibiotics and parenteral nutrition.

We are looking forward to future collaborations with Dr. De Mey and his colleagues.

8. FUTURE DIRECTIONS

8.1 Mission 2019 – 1

We plan to return to Namibia in February 2019 for our 7th mission to continue our support at Rundu State Hospital. We sincerely hope that construction of the building that will house the new Maternity Ward and Prem Unit will have been completed by that time. We would then have the opportunity to plan the stepwise provision of additional equipment.

Time permitting, we would also travel back to Onandjokwe to intensify our training in this hospital. According to the Minister of Health, the construction of the new Maternity Ward and Prem Unit will be given a high priority, and we would be happy to give advice on how to organize the new neonatology unit.

8.2 New Prem Unit and Neonatology Training Center (NTC)

Once again, we would like to suggest that a Neonatology Training Center (NTC) could be established at Rundu State Hospital once the new unit can be opened and operated. Visiting physicians and nurses from other hospitals could then be trained at Rundu State Hospital by the experienced local staff and the team members of NEO FOR NAMIBIA – Helping Babies Survive.

The health care professionals that have been trained by the members of NEO FOR NAMIBIA – Helping Babies Survive could thus act as teachers themselves and pass on their experience to their colleagues from other hospitals.

8.3 Interns and junior residents for Rundu State Hospital

It would be highly desirable that junior physicians (interns, first year residents) and medical students would be given the opportunity to work at the Rundu State Hospital with rotations in the pediatric wards. They could support the experienced staff physicians by increasing the physician presence in the units and, at the same time, benefit from the experience of their senior colleagues.

Such a system seems to be in place at Onandjokwe State Hospital, and it was obvious during our visit there that this is a very valuable investment, benefitting both the young doctors, the senior staff and the patients.

8.4 CPAP registry and Minimal Neonatal Data Set (MNDS)

Patient outcome must be better documented. As outlined above, we will encourage and support the health care professionals to collect data for the CPAP registry and the – yet to be established – Minimal Neonatal Data set (MNDS). These efforts should be complemented by regular (e.g., bi-monthly) Morbidity and Mortality conferences.

8.5 Limiting staff rotation and avoiding brain drain

Progress made in the Prem Unit at Rundu State Hospital could be seriously jeopardized if skilled staff members leave the unit (either because they are forced to rotate to another unit or because their contracts are not renewed). This is true both for physician and nursing staff. Every effort should be made, to retain at least a skilled core group of doctors and nurses in the unit.

8.6 Improving laboratory services

The services provided by the Namibia Institute of Pathology must be improved. It is common that blood samples clot or get lost. Results only become available with an inacceptable delay (e.g. serum bilirubin values to decide whether or not phototherapy should be started). Grossly abnormal laboratory results are not automatically communicated to the unit or the physician in charge.

8.7 Admission of outborn infants

Outborn infants should be admitted to the Prem Unit as well; the Pediatric Ward and the High Care Unit lack appropriate equipment, and the staff is not experienced enough to take care of sick neonates. Concerns regarding infectious diseases are not justified if standard precautions, particularly meticulous hand hygiene, are followed (only exceptions: older babies with suspected viral respiratory tract infections, babies with gastroenteritis).

8.8 Final comments

Various interventions suggested and supported by NEO FOR NAMIBIA – Helping Babies Survive have undoubtedly made a difference. This would not have been possible without the help and support of the Health Minister, Dr. Bernard Haufiku, and his staff, as well as the collaboration of the hospital administration and the enthusiastic and hardworking doctors and nurses of the Prem Unit. The results are indeed very positive and encourage us to continue and – if possible – increase our support.

If all of the parties involved continue to work together, we are confident that further progress can be made, and more babies will survive.

Prof. Thomas M. Berger, MD
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Helping Babies Survive

Sabine Berger, RN
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Helping Babies Survive

9. REFERENCES

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