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An Outpatient Methadone Weaning Protocol by a Neonatal Intensive Care Unit for Neonatal Abstinence Syndrome

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Introduction:

- Neonatal Abstinence Syndrome (NAS): neonatal withdrawal symptoms as a result of perinatal exposure to drugs, especially opiates, during pregnancy.
- The rate of NAS has increased by 300% in the United States since the 1980's¹.
- NAS treatment costs reaches as high as \$112.6 million dollars per year, the majority of which was heavily influenced by extended hospital stays².
- Inpatient management using traditional strategies of care has led to a length of stay (LOS) range of 8-105 days with a median of 25-34 days^{3,4,5}.
- Oei et al 2001⁶ found that inpatient LOS was decreased with the establishment of an outpatient clinic designed specifically for managing NAS patients.
- The Neonatal Intensive Care Unit (NICU) at Lehigh Valley Health Network (LVHN) has adopted an outpatient methadone weaning protocol to treat NAS patients with the goal of limiting readmissions and decreasing inpatient length of stay.

Plan:

- Characterize patients with NAS, describe the current practices used at LVHN to treat infants with NAS, assess outcome variables at LVHN.

Variable	Median	Mean	SD
Estimated Gestational Age (weeks)	39.50	39.46	1.14
Total Hospital Length of Stay (days)	10.00	12.21	5.32
Total Days on Methadone Treatment before Discharge	8	10.05	5.11
Time to Q24 Methadone dosing	5.93	7.45	4.02
Total Hospital Charges	\$53,081.00	\$61,421.66	\$32,816.05

Table 1: Secondary Patient Outcomes. There were 56 patients identified that met inclusion/exclusion criteria.

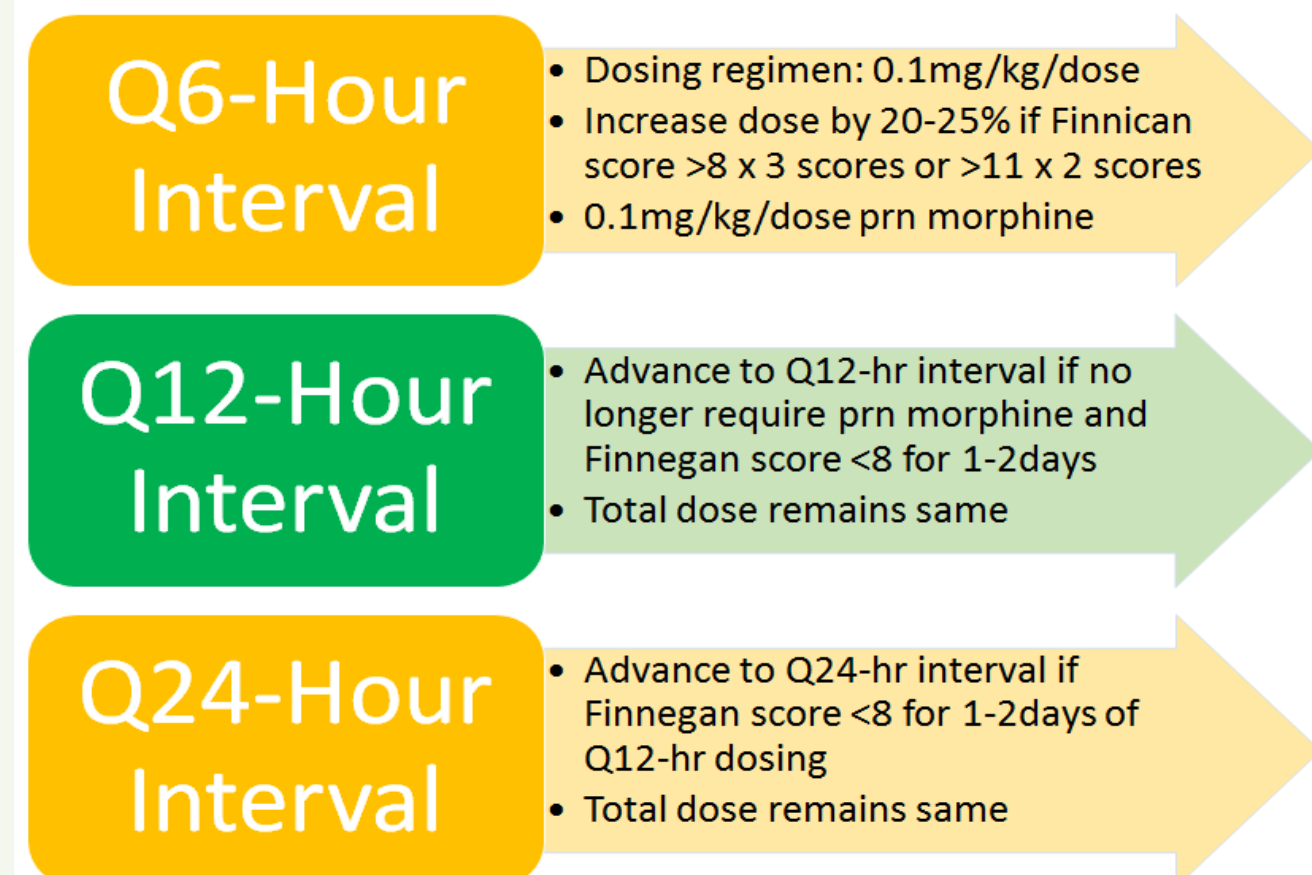


Figure 1: Inpatient Methadone Weaning Protocol. For infants with Finnegan Scores >8, additional steps are taken such as supplementation with high-calorie formula and vestibular stimulation.

Do:

- All term newborns (>37 weeks Estimated Gestational Age) at Lehigh Valley Hospital - Cedar Crest (LVH-CC) between 1/1/2010 and 12/31/2014, admitted to LVH-CC, with an ICD-9 co-diagnosis of NAS at discharge were examined
- Data collected via electronic medical records independently by at least two investigators
- Exclusion criteria: treatment for NAS with medications other than opioids, an EGA less than 37 weeks at birth, congenital anomalies, iatrogenic NAS due to opiate administration while in the NICU, or infants of multiple gestation.

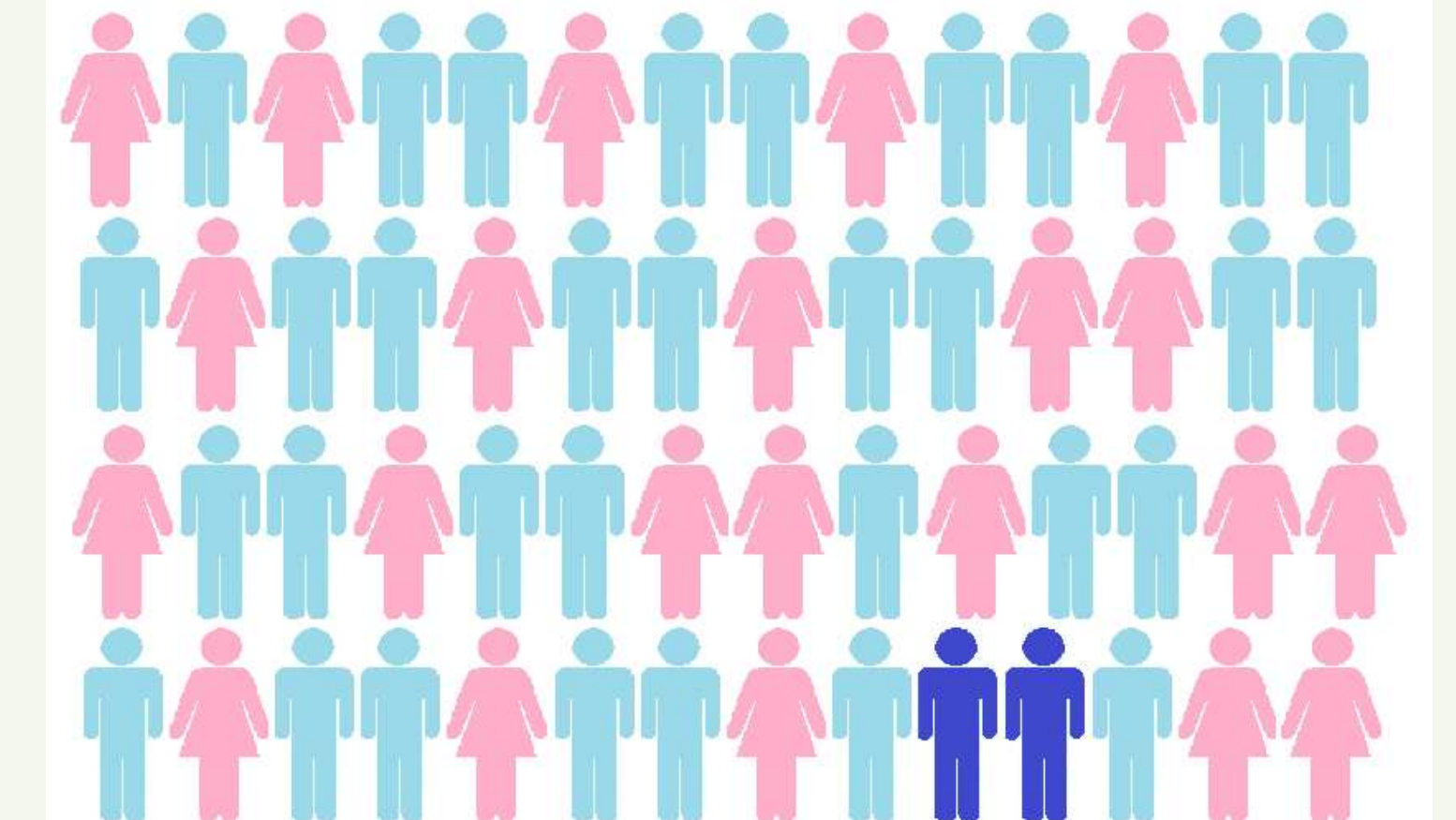
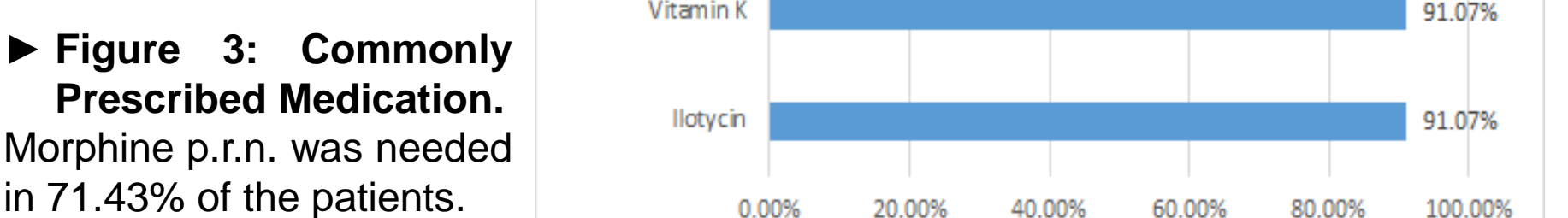
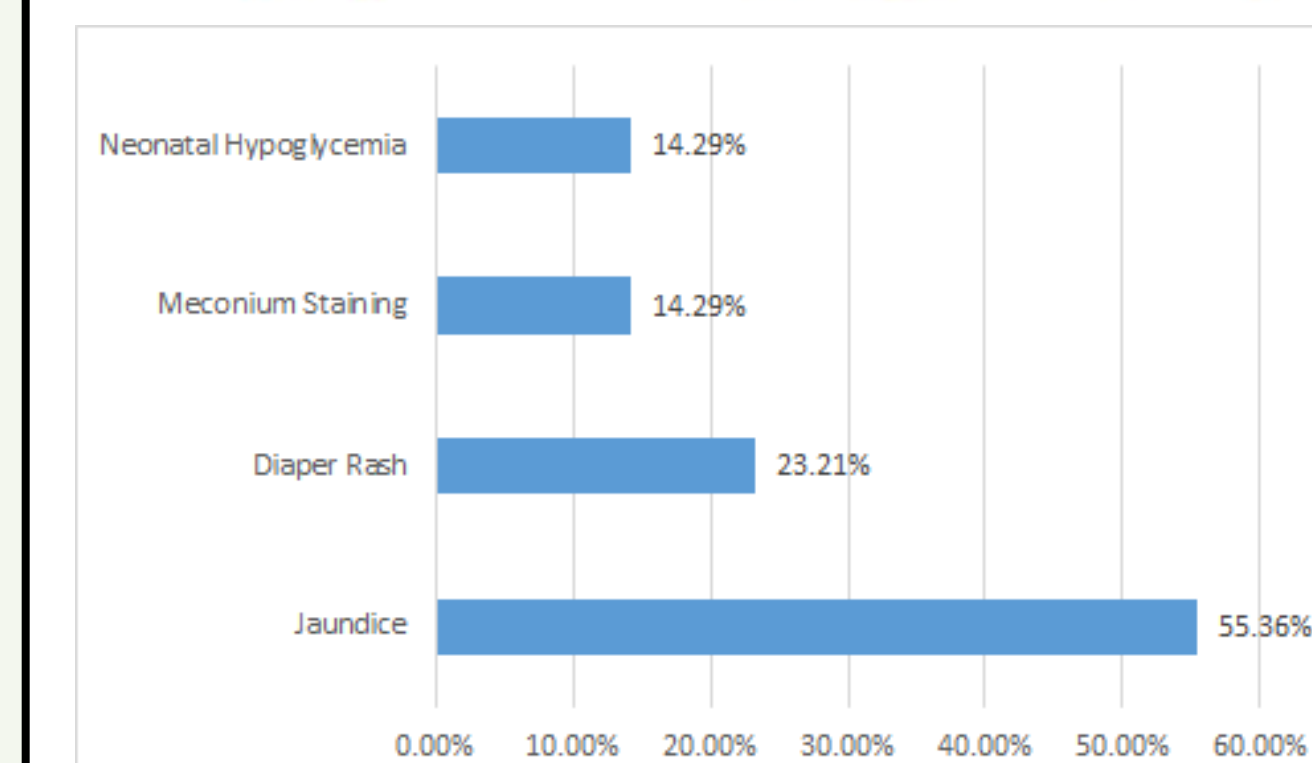
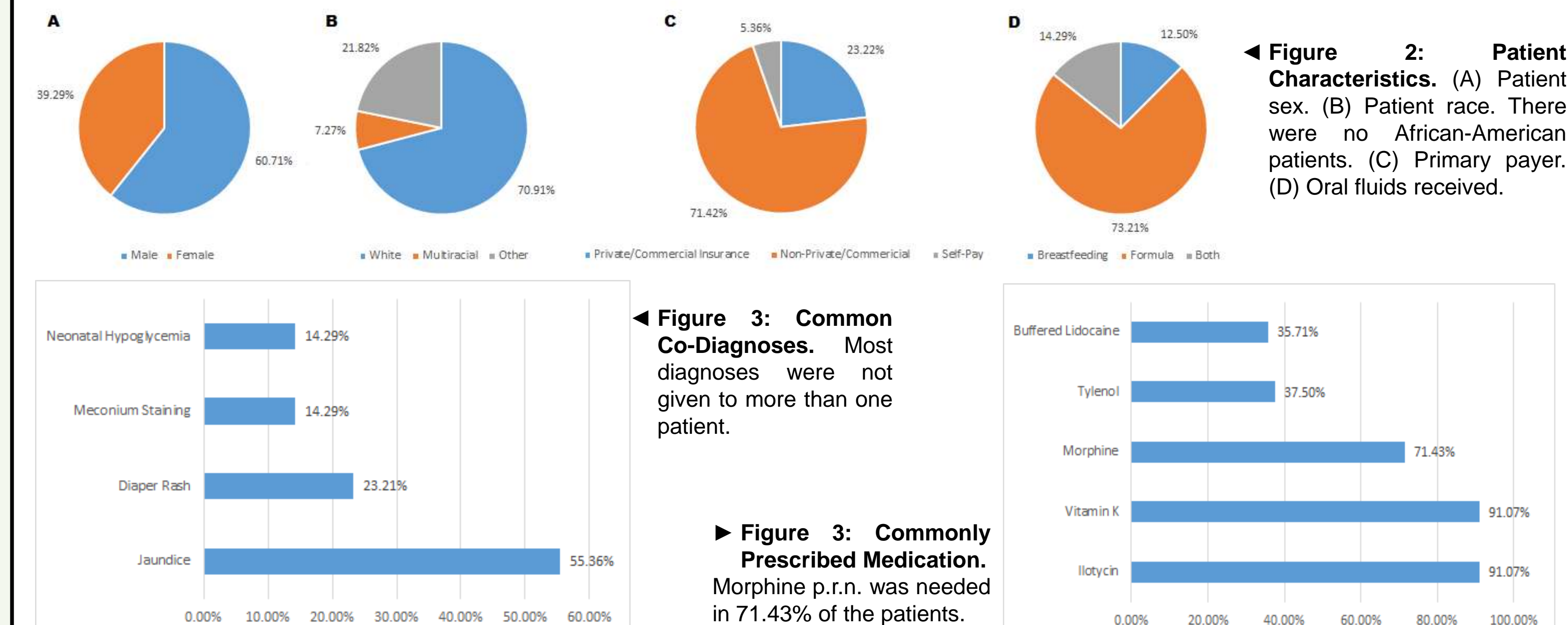


Figure 4: Readmissions Rate. There were two 30-day readmissions in this group, with only one related to NAS. The first patient was readmitted in 2013 for neonatal drug withdrawal symptoms 11 days after initial discharge and was later discharged 16 days after readmission.

Study / Results:



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Act / Conclusions:

- The establishment of a clear management protocol for infants discharged from the NICU for NAS has many advantages. It has been shown to increase opportunities for maternal-infant pair bonding due to shorter hospital stays and increased rates of breastfeeding⁷.
- Abdel-Latif et al. 2002⁸ found that the role of breastfeeding in the outpatient management of NAS led to reduced withdrawal severity, delayed onset of NAS, and decreased need for pharmacologic treatment.
- Backes et al 2012⁹ calculated that patients in combined inpatient-to-outpatient management plan saved on average \$13,817 in hospital costs per patient compared to a traditional, inpatient-only management strategy.
- Next Steps: develop clinical pathway, compare cost savings**

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