Inequalities in health and their effect on the newborn

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  Leeds Neonatal Service
  Leeds Teaching Hospitals NHS Trust

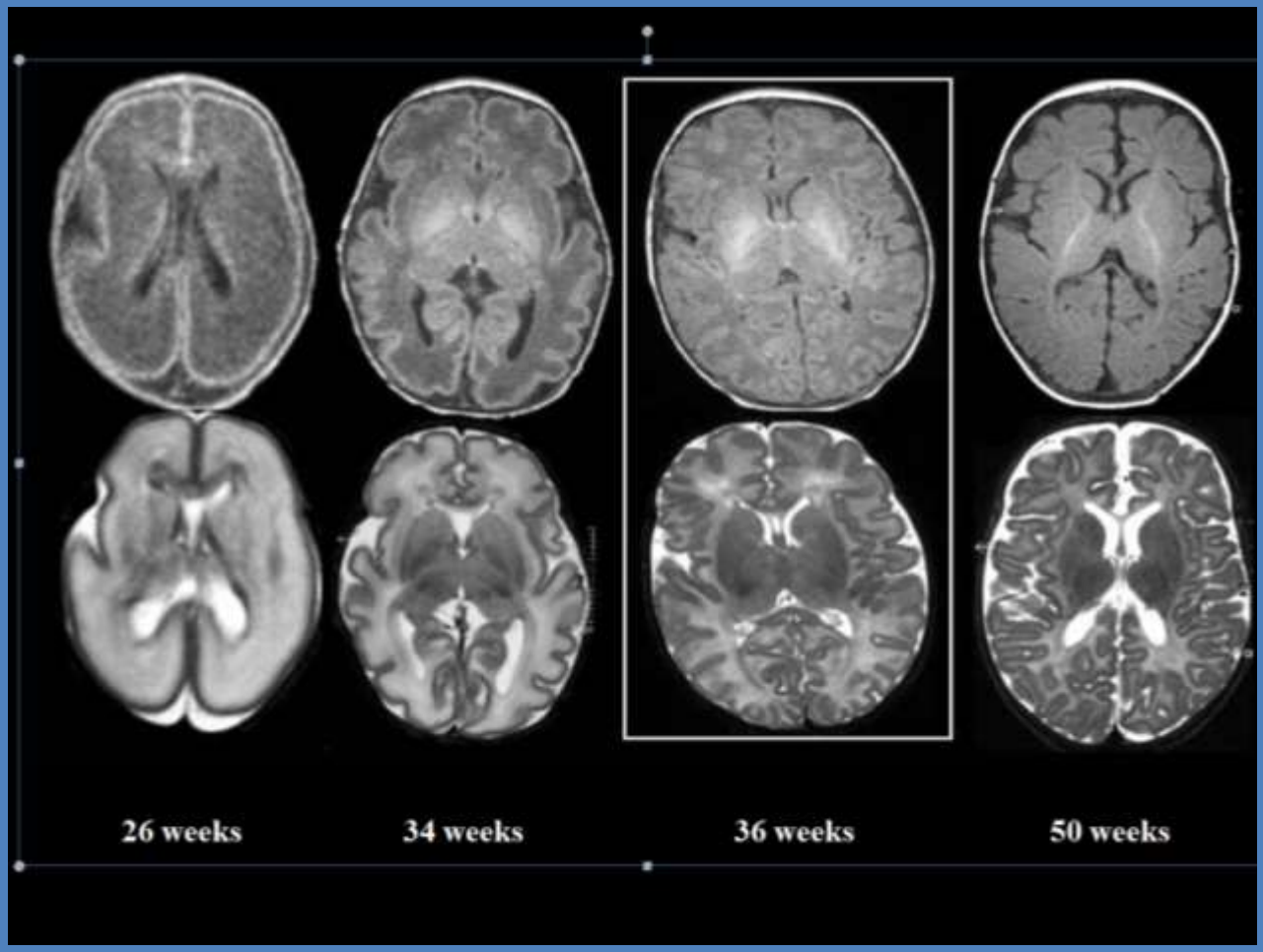
- Consultant Neonatologist
- Research lead

- Neonatal Abstinence Syndrome

- Covered all in depth – take all day
- Many are interlinked

- Smoking
- Alcohol
- Obesity
- Homelessness
- Poverty
- Malnutrition
- Mental Health

Fetal Growth From 8 to 40 Weeks
Embryo at 8 Weeks
Fetus at 12 Weeks
16
20
24
28
32
36
40


26 weeks
34 weeks
36 weeks
50 weeks

- Prematurity
- Fetal Alcohol Syndrome/Spectrum Disorder (FAS/FASD)
- Neonatal Abstinence Syndrome

- Illustrate with real clinical cases

The effect of prenatal drug exposure

	Nicotine	Alcohol	Marijuana	Opiates	Cocaine	Meths
Short term effects / birth outcomes						
Foetal Growth	Effect	Strong Effect	No Effect	Effect	Effect	Effect
Abnormalities	No Agreement	Strong Effect	No Effect	No Effect	No Effect	No Effect
Withdrawal	No effect	No Effect	No Effect	Strong Effect	No Effect	*
Behaviour	Effect	Strong Effect	Effect	Effect	Effect	Effect
Long term effects						
Growth	No Agreement	Strong Effect	No Effect	No Effect	No Agreement	*
Behaviour	Effect	Strong Effect	Effect	Effect	Effect	*
Cognition	Effect	Strong Effect	Effect	No Agreement	Effect	*
Language	Effect	Effect	No Effect	*	Effect	*
Achievement	Effect	Strong Effect	Effect	*	No Agreement	*

* Limited or no data available

Adapted from Journal of the American Academy of Pediatrics - Prenatal Substance abuse: Short and Long term effects on the exposed Foetus. Committee on Substance Abuse & Committee on Foetus and Newborn Feb 25th 2013.

Risk factors for prematurity

Increased risk of prematurity with:

- Sexually transmitted infections
- Being underweight or obese before pregnancy
- Short time period between pregnancies (less than 6 months between a birth and the beginning of the next pregnancy)
- Gestational diabetes
- Ethnicity.
- Age of the mother.
  - women younger than age 18 are more likely to have a preterm delivery.

Certain lifestyle and environmental factors, including:

- Late or no health care during pregnancy
- Smoking
- Drinking alcohol
- Using illegal drugs
- Domestic violence, including physical, sexual, or emotional abuse

- In itself is then a risk factor for long term health problems
- Complex interlinking of all the different factors – difficult to fix
- Starts even before conception

- Bottom line – many of the factors linked to social inequality are risk factors for prematurity.

Alcohol Use in Pregnancy

Baby TK

- SVD, born at home
- Ambulance called as baby born before medical advice sought.
- Baby with mum at side of bath. Baby quiet.

  Responded to stimulation, no further resuscitation required.
- Cord intact – cut by ambulance staff

Antenatal Hx

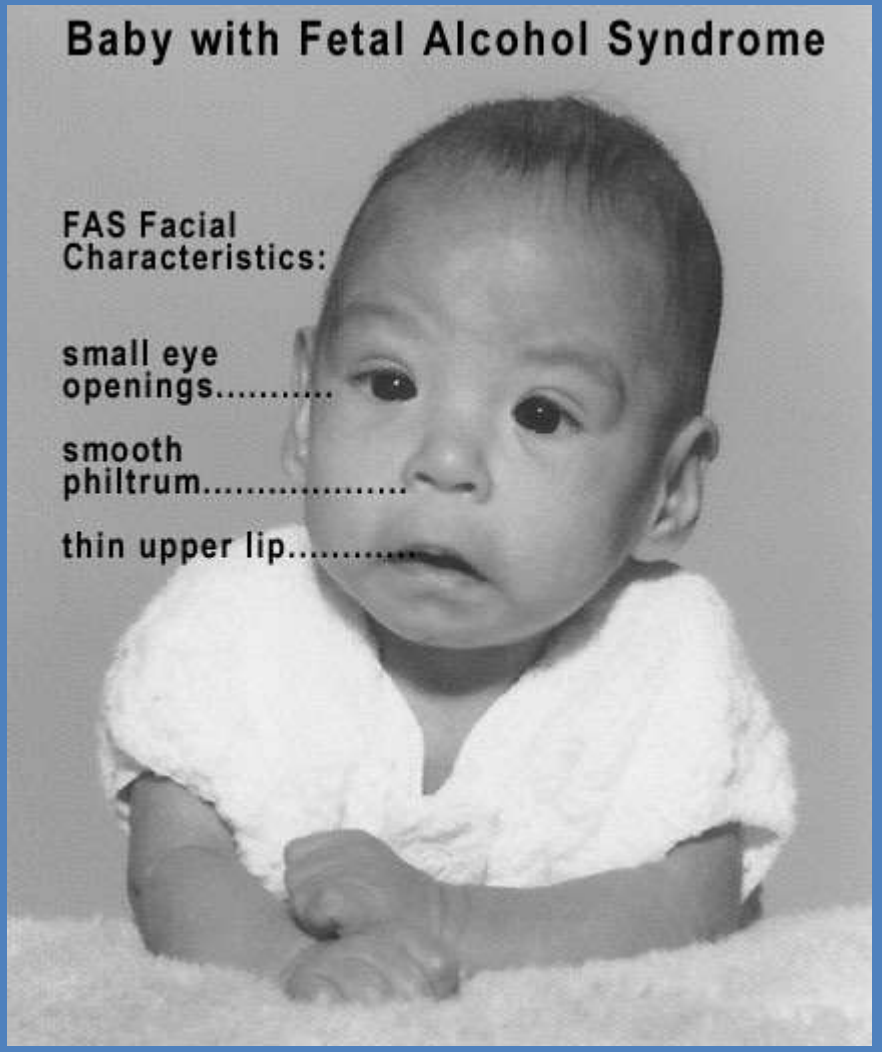
- Undisclosed pregnancy
  - No engagement with antenatal services
  - Smokes cannabis/cigarettes, high alcohol consumption, no history of opiate use
- 2 older children
  - 1 living with biological father
  - 1 living in foster care, undergoing adoption process
- Planned for EPO

- Paramedics questioned parental use of alcohol/drugs around the time of delivery.
- Dirty house
- No electricity
- Parents “looked neglected”

- Birthweight 1790g
- Gestation estimated using Dubowitz/Ballard Exam for Gestational Age
  - Calculated as 38/40, IUGR

On examination

- IUGR
- Dysmorphic
  - Smooth philtrum
  - Upturned nose
  - Thin upper lip
  - Small palpebral fissures
  - Flat nasal bridge



- Treated with 48 hours antibiotics as risk of infection
- Slow to establish feeds.
  Required prolonged nasogastric tube feeds
- Scored on NAS charts as irritable at times
  Started on morphine treatment on D19

Withdrawal symptoms

- Urine toxicology – not processed
- No clear history of drug misuse other than cannabis
- No urines in pregnancy as did not engage with services
- Unusual timing.

  Intermittent – occasional extremely high scores but settled in between.
- Commenced morphine but quickly stopped.

- Discharged to foster care
  - Continues to establish oral feeds
- Follow up in multidisciplinary NAS clinic

Fetal Alcohol Syndrome (FAS)
Fetal Alcohol Spectrum Disorder (FASD)

- Various and confusing nomenclature
- FAS “full blown” syndrome
- FASD wide and varied effects

- Confusing public health messages
- High alcohol use in drug using population
- Not just an illness of those affected by social deprivation!

JAMA Pediatrics | Original Investigation

Global Prevalence of Fetal Alcohol Spectrum Disorder Among Children and Youth

A Systematic Review and Meta-analysis

Shannon Lange, MPH; Charlotte Probst, MSc; Gerrit Gmel, MSc; Jürgen Rehm, PhD; Larry Burd, PhD; Svetlana Popova, PhD

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Supplemental content

IMPORTANCE Prevalence estimates are essential to effectively prioritize, plan, and deliver health care to high-needs populations such as children and youth with fetal alcohol spectrum disorder (FASD). However, most countries do not have population-level prevalence data for FASD.

OBJECTIVE To obtain prevalence estimates of FASD among children and youth in the general population by country, by World Health Organization (WHO) region, and globally.

DATA SOURCES MEDLINE, MEDLINE in process, EMBASE, Education Resource Information Center, Cumulative Index to Nursing and Allied Health Literature, Web of Science, PsychINFO, and Scopus were systematically searched for studies published from November 1, 1973, through June 30, 2015, without geographic or language restrictions.

STUDY SELECTION Original quantitative studies that reported the prevalence of FASD among children and youth in the general population, used active case ascertainment or clinic-based methods, and specified the diagnostic guideline or case definition used were included.

DATA EXTRACTION AND SYNTHESIS Individual study characteristics and prevalence of FASD were extracted. Country-specific random-effects meta-analyses were conducted. For countries with 1 or no empirical study on the prevalence of FASD, this indicator was estimated based on the proportion of women who consumed alcohol during pregnancy per 1 case of FASD. Finally, WHO regional and global mean prevalence of FASD weighted by the number of live births in each country was estimated.

MAIN OUTCOMES AND MEASURES Prevalence of FASD.

RESULTS A total of 24 unique studies including 1416 unique children and youth diagnosed with FASD (age range, 0-16.4 years) were retained for data extraction. The global prevalence of FASD among children and youth in the general population was estimated to be 7.7 per 1000 population (95% CI, 4.9-11.7 per 1000 population). The WHO European Region had the highest prevalence (19.8 per 1000 population; 95% CI, 14.1-28.0 per 1000 population), and the WHO Eastern Mediterranean Region had the lowest (0.1 per 1000 population; 95% CI, 0.1-0.5 per 1000 population). Of 187 countries, South Africa was estimated to have the highest prevalence of FASD at 111.1 per 1000 population (95% CI, 71.1-158.4 per 1000 population), followed by Croatia at 53.3 per 1000 population (95% CI, 30.9-81.2 per 1000 population) and Ireland at 47.5 per 1000 population (95% CI, 28.0-73.6 per 1000 population).

CONCLUSIONS AND RELEVANCE Globally, FASD is a prevalent alcohol-related developmental

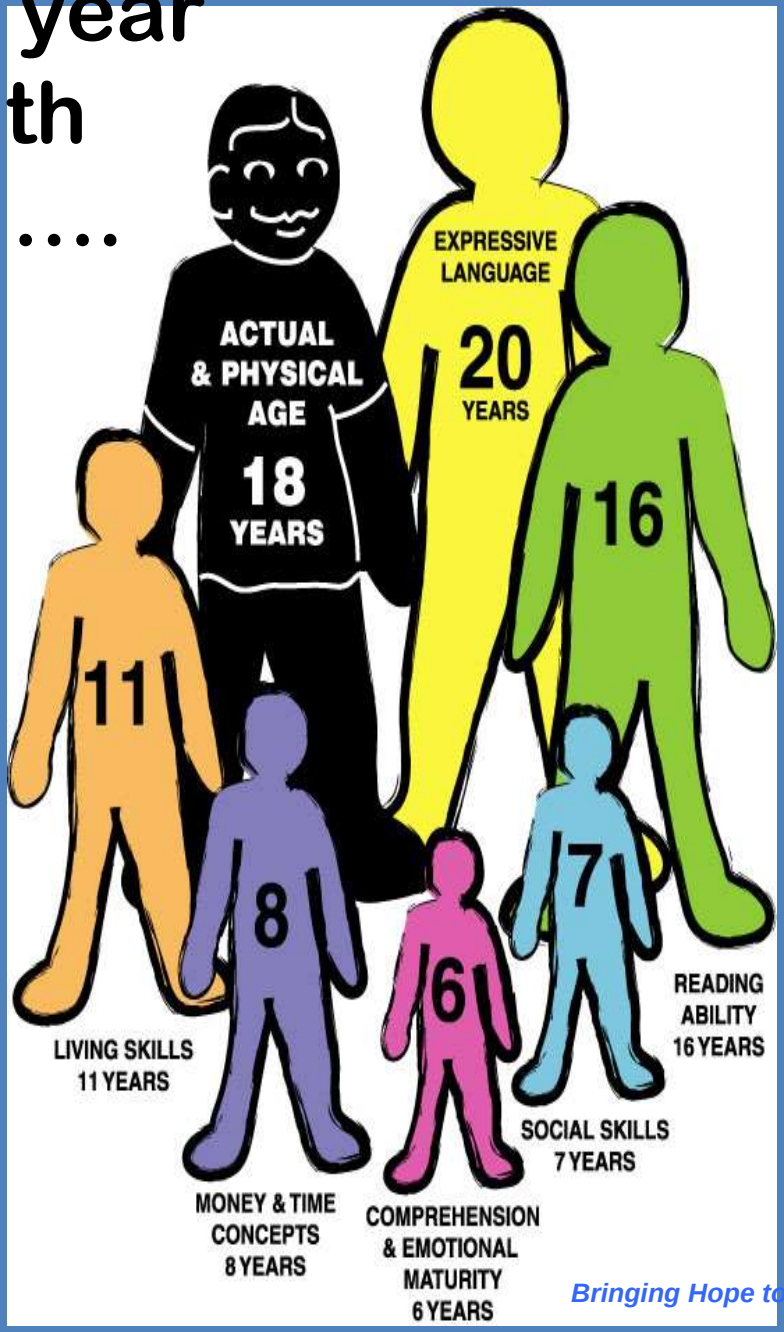
- Effects are lifelong
- Significant challenges for development
- Challenging behaviour
- Often undiagnosed or mis-diagnosed

- No specific treatment BUT

COMPLETELY PREVENTABLE

My baby's too young to drink!
Be kind to me stay alcohol free
Are you pregnant or thinking of becoming pregnant?
Talk to your doctor or midwife about making healthy choices for you and your baby.
Helpline: 01608 811 599
www.fasdtrust.co.uk
the fasd trust

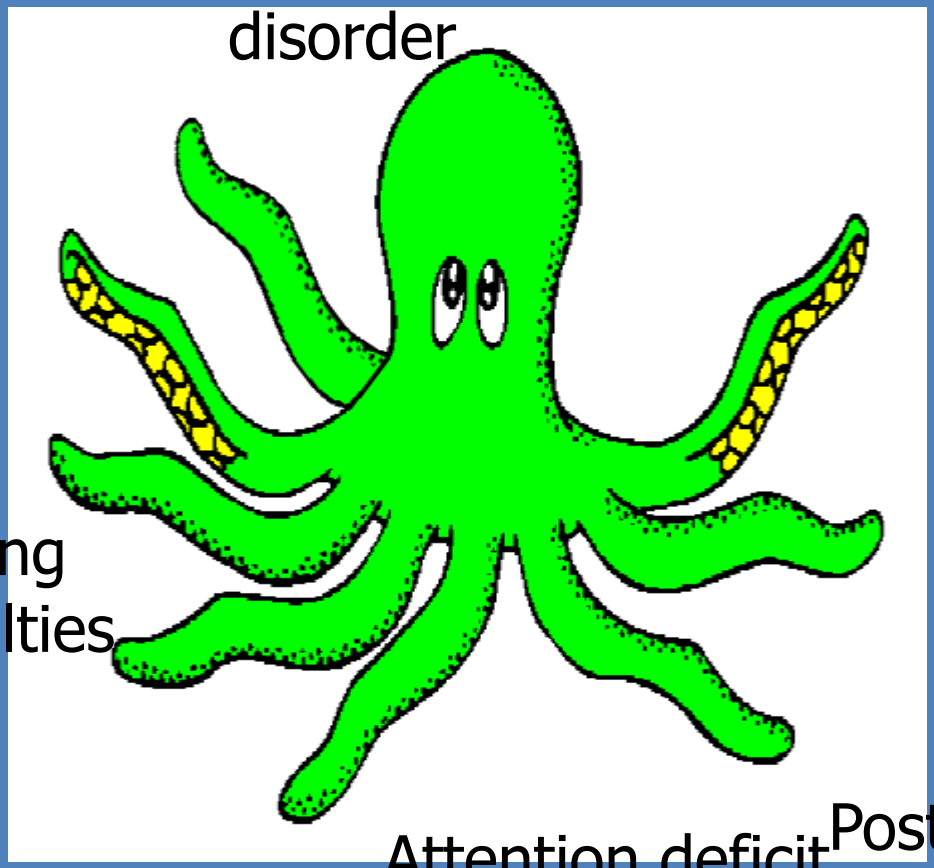
An 18 year old with FASD ….



Bringing Hope to those affected by FASD

Attachment disorder

Borderline personality disorder



Autistic Spectrum disorder

Conduct disorder

Learning Difficulties

Dyspraxia

Attention deficit hyperactivity Disorder

Post traumatic stress disorder

- What are we doing to help?
  - policy (APPG)
  - better history taking in pregnancy
  -better understanding of the scale of the problem
    -FAEE in meconium
    -National BPSU study

Neonatal Abstinence Syndrome

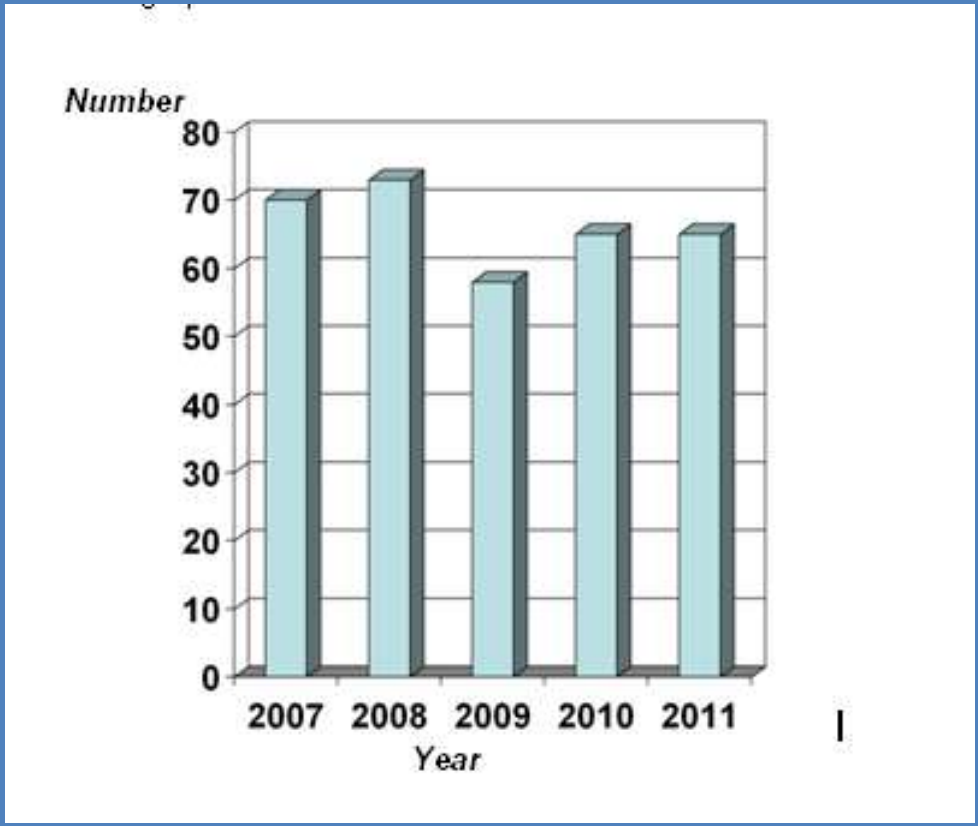


TABLE 3 Clinical Features of the Neonatal Narcotic Abstinence Syndrome

Neurologic Excitability	Gastrointestinal Dysfunction
Tremors	Poor feeding
Irritability	Uncoordinated and constant sucking
Increased wakefulness	Vomiting
High-pitched crying	Diarrhea
Increased muscle tone	Dehydration
Hyperactive deep tendon reflexes	Poor wt gain
Exaggerated Moro reflex	Autonomic signs
Seizures	Increased sweating
Frequent yawning and sneezing	Nasal stuffiness
	Fever
	Mottling
	Temperature instability

Neonatal Abstinence Syndrome represents a group of symptoms observed in infants withdrawing from maternal substance use during pregnancy

It happens to between 54% and 94% of all babies who have been exposed to opiates in the womb

Most Common Substances

Heroin

Cocaine

Methadone

Buprenorphine

Benzodiazepines

Codeine

Amphetamines

Alcohol

Management in Leeds

- Specialised ante natal clinic
- Midwifery and Addiction Unit support
- Public health education
- 32 week planning meeting

Assessment

- Scoring
- Mum's history
- Clinical opinion
- Response to supportive measures

Prolonged crying, sleeplessness
Tremors

- Hold baby close
- Wrap in a cool sheet
- Decrease loud noises
- Dim lights
- Avoid stimulation
- Calming voice
- Gentle rocking
- Soothing bath
- Check for sore bottom

Poor Feeding

Excessive Sucking

- Cover hands with mittens
- Avoid lotions/creams on hands
- Keep neck and chin areas clean and dry
- Apply small amount of vaseline to chin if sore
- Feed small amounts often
- Allow rest time between sucks
- Feed in quiet, calm place

Gastro-intestinal symptoms

Colic

Diarrhoea

Excoriated buttocks

- Ensure baby is winded well before, during and after feeds
- Infacol sometimes useful, but unproven
- Check nappy more often
- Apply barrier cream as soon as baby shows signs of withdrawal
- Ask for advice re: change of milk to one more easily digestible
- Always use powdered milk

Sneezing, stuffy nose and breathing problems

- Keep mouth and nose clean
- Avoid overdressing or wrapping too tightly
- Feed slowly, allowing rest between sucking episodes
- Give smaller feeds more often
- If the baby is breathing rapidly, has nasal flaring, or his chest is indrawing, seek medical advice

Skin Complications

Sore, rubbed chin

Excoriated armpit

Paronychia

Neurological Symptoms

Jittery

Seizures

Tense

High-pitched cry

Myoclonic jerks

Baby A

- Term baby
- Good weight
- Normal delivery

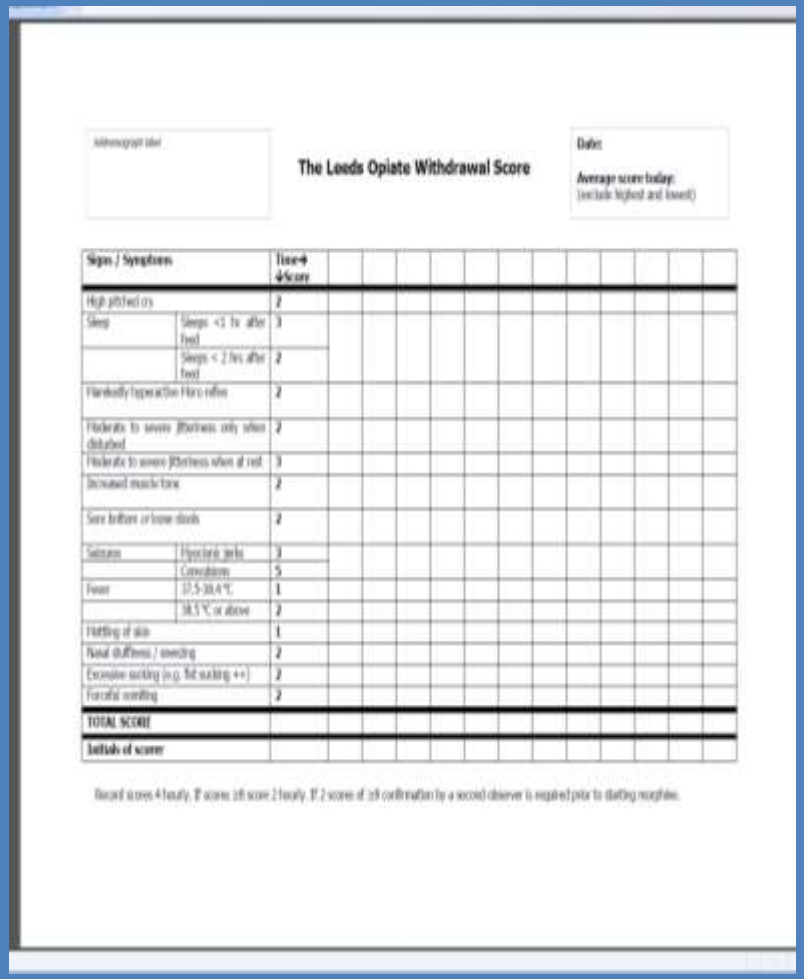
- Admitted to SCBU as voluntarily for adoption & risk of withdrawal

Why is this environment not good?

- Mum on methadone. Known to LAU.

- 36 hours old
- Started morphine as high scores (up to 14)

- Did not need any increases in dose
- Required 1 week of starting dose



The Leeds Opiate Withdrawal Score

Date:

Average score today:
(exclude highest and lowest)

Signs / Symptoms		Time→ ↓Score													
High pitched cry		2													
Sleep	Sleeps <1 hr after feed	3													
	Sleeps < 2 hrs after feed	2													
Markedly hyperactive Moro reflex		2													
Moderate to severe jitteriness only when disturbed		2													
Moderate to severe jitteriness when at rest		3													
Increased muscle tone		2													
Sore buttocks or loose stools		2													
Seizures	Myoclonic jerks	3													
	Convulsions	5													
Fever	37.5-38.4 °C	1													
	38.5 °C or above	2													
Mottling of skin		1													
Nasal stuffiness / sneezing		2													
Excessive sucking (e.g. Not sucking ++)		2													
Forceful vomiting		2													
TOTAL SCORE															
Initials of scorer															

Record scores 4 hourly. If scores ≥8 score 2 hourly. If 2 scores of ≥8 confirmation by a second observer is required prior to starting morphine.

Baby M: Ante natal history

- Mum 30 years old. Known to LAU.
- Presented to LAU antenatal clinic at 30 weeks
- 32 week planning meeting (standard practice):
  - plan for baby to go to foster care at discharge
- On methadone + heroin & cocaine
- House – unsuitable for newborn infant
- 2 previous children
  - 1st child. RIP SIDS. Aged 3 months
  - 2nd child. In care.

Baby M: Birth history

- Born @ 41 weeks. 3435g
- No resuscitation required
- Admitted to transitional care with mum

Baby M: Progress

- Breast/bottle fed by mum (50/50)
- Low NAS scores
- Not requiring pharmacological treatment

- Waited for identification of suitable foster carer

- Day 8. Decision made to discharge to foster care
- Switched to all formula feeds & discharged.

Baby M: 2nd admission

- Day 25

- Presented to paediatric A&E jittery & irritable
- High scores – 19 on admission (8 threshold for treatment)

- Commenced on treatment as per neonatal protocol
- Quickly settled. Required 10 days treatment with oral morphine
- Discharged back to foster care

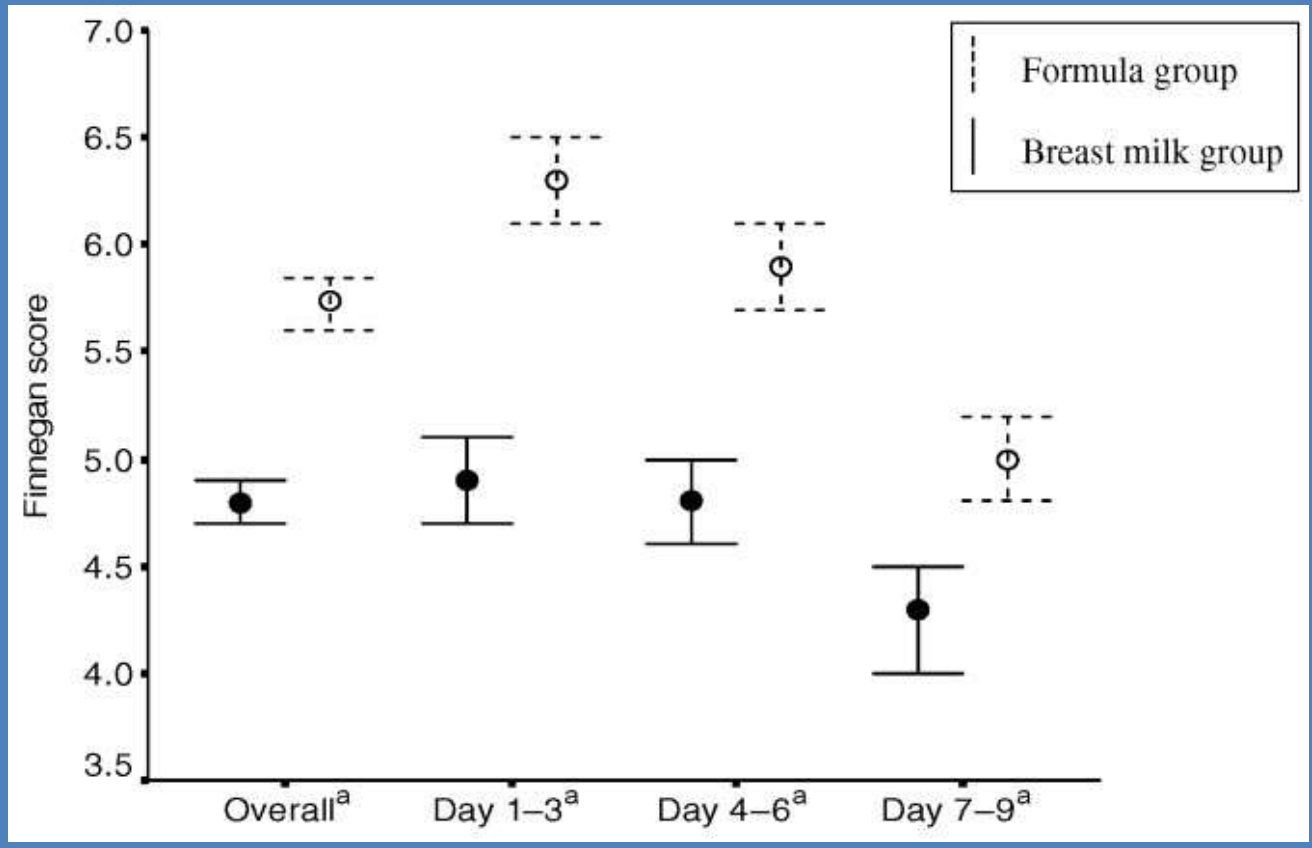
How can we improve care

- Changes in antenatal prescribing
- Optimisation of pharmacological treatment
- Home treatment for all? Those in foster care (training package)
- Breastfeeding

Breastfeeding & NAS

- Universal life long benefits of breastmilk
- Very low rate
- Increasing evidence regarding the benefits of breast feeding in this group.
- Issues around foster care & abrupt cessation of breast milk

- Mean scores for breast fed babies were significantly less than formula fed babies ($p<0.05$)



- Breast fed infants were significantly less likely to require treatment for withdrawal ($p<0.001$)
- Maximum amount of morphine dose required considerably lower in the breastfed group.
- Mean duration of hospitalization for formula group 5 days longer than breast fed group

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An Initiative to Improve the Quality of Care of Infants With Neonatal Abstinence Syndrome

Matthew R. Grossman, Adam K. Berkwitt, Rachel R. Osborn, Yaqing Xu, Denise A. Esserman, Eugene D. Shapiro, Matthew J. Bizzarro

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Abstract

BACKGROUND AND OBJECTIVES: The incidence of neonatal abstinence syndrome (NAS), a constellation of neurologic, gastrointestinal, and musculoskeletal disturbances associated with opioid withdrawal, has increased dramatically and is associated with long hospital stays. At our institution, the average length of stay (ALOS) for infants exposed to methadone in utero was 22.4 days before the start of our project. We aimed to reduce ALOS for infants with NAS by 50%.

METHODS: In 2010, a multidisciplinary team began several plan-do-study-act cycles at Yale New Haven Children's Hospital. Key interventions included standardization of nonpharmacologic care coupled with an empowering message to parents, development of a novel approach to assessment, administration of morphine on an as-needed basis, and transfer of infants directly to the inpatient unit, bypassing the NICU. The outcome measures included ALOS, morphine use, and hospital costs using statistical process control charts.

RESULTS: There were 287 infants in our project, including 55 from the baseline period (January 2008 to February 2010) and 44 from the postimplementation period (May 2015 to June 2016). ALOS decreased from 22.4 to 5.9 days. Proportions of methadone-exposed infants treated with morphine decreased from 98% to 14%; costs decreased from $44 824 to $10 289. No infants were readmitted for treatment of NAS and no adverse events were reported.

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- Prematurity is closely linked with social deprivation
- Once had one prem baby high risk of further prems
- Issues are complex and interlinked
- Fetal Alcohol Syndrome and associated conditions are completely preventable
- NAS is unpleasant for the baby and difficult to treat

- Social deprivation has pervasive detrimental effects
- From pre-conception to early newborn life (and beyond)
- No quick answer
- Education (prior to pregnancy) is key

CONFUSION