CHAPTER 1

History taking and the newborn examination: an evolving perspective

Claire Evans

Warrington and Halton Hospitals NHS Foundation Trust, Warrington, Cheshire, UK

KEY POINTS

- The principal aim of history taking is to screen for predictive risk indicators that may predispose the newborn to an adverse postnatal transition or presence of an abnormality that requires an appropriate and timely referral for further diagnostics.
- The newborn examination history-taking process should be mapped to the Public Health England (PHE) Antenatal and Newborn Screening Programme and be used as a benchmark for screening and assessment of risk factors in the neonatal period and beyond.
- Identification of risk factors within the newborn examination can isolate and target health promotion issues.

Introduction

A comprehensive history taking is implicit to all health care disciplines to aid the diagnostic consultation process and to inform the optimal course of management. The skill of history taking has changed over the decades and has adopted a wider context as a predictive diagnostic tool. To facilitate a more holistic approach to the examination of the newborn, a thorough evaluation of the maternal and newborn history is essential.

Examination of the Newborn: An Evidence-Based Guide, Third Edition. Edited by Anne Lomax.

Companion website: www.wiley.com/go/lomax/newborn

Short-term outcomes, long-term morbidities or even mortality can be influenced by the quality of the history taking in terms of the predictive risk for some adverse clinical conditions.

This chapter outlines the context of the history profile from the maternal, perinatal and familial perspective. It also addresses history taking as a skill as well as the potential barriers that may reduce the effectiveness of the process. The aim of this chapter is not only to address common risk factors but to embrace the wider context of history taking from a psychosocial and safeguarding perspective (see also the website that accompanies this book for more information on safeguarding and the newborn examination). The focus on history taking must be meaningful, achievable and valuable to the newborn examination practitioner. History taking remains the principal standard underpinning the clinical examination; to disregard the importance of history taking may lead to suboptimal practice and outcomes. Effectively gathering a history demands time and should not be rushed because it is a powerful instrument that can influence the quality of the examination.

Historically, the profile of the newborn examination systematic history assessment has been raised over the decades (NHS QIS 2008; NICE 2015; PHE 2020c; Skills for Health 2019). However, history taking is an essential component of the newborn and infant physical examination (NIPE) that has been validated through the development of the UK National Screening Committee (NSC) NIPE Programme (PHE 2018a) and implementation of the national NIPE Programme guidance documents mandating the programme (PHE 2018; 2020c).

For the purposes of this chapter, the National Health Service (NHS) Antenatal and Newborn Screening Programmes will be used as a framework to underpin the history-taking process. This approach should encompass all relevant information from the maternal and newborn medical records, dialogue with the mother and/or father and information from clinical staff.

The NIPE Programme Handbook, standards and service specifications can be found on the gov.uk website:

https://www.gov.uk/government/publications/newborn-and-infant-physical-examination-programme-handbook/newborn-and-infant-physical-examination-screening-programme-handbook

https://www.gov.uk/government/publications/newborn-and-infant-physical-examination-screening-standards

https://www.england.nhs.uk/wp-content/uploads/2017/04/Service-Specification-No.21-NIPE.pdf.

The NIPE Programme Newborn Screening Pathway can be found as an appendix to the Programme Handbook and on the following weblink:

https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/702100/NIPE_Screening_Programme_Newborn_Pathway.pdf.

Objectives and characteristics of good history taking

The principal aim of the history-taking exercise is to identify predictive risk indicators for those newborns that may be risk of an adverse postnatal transition extending into childhood. Families with newborns who are identified as being at risk will then benefit

from early detection, intervention and treatment options. To achieve this, the history profile must be factual, accurate, concise, informative and relevant. Discussions with the parents, to gather the history, can also offer a platform that targets health awareness and safety issues to promote optimal health in the neonatal period and beyond. A review of maternal and parental lifestyle habits in general, e.g. smoking, addictive behaviours and high-conflict relationships, can be identified, and appropriate timely referrals or support can be arranged. Other health promotion issues including BCG vaccination to high-risk populations can be actioned.

A quality history-taking process is largely dependent upon the skill of the practitioner. Health care professionals who conduct the newborn examination are fortunate in having pre-existing skills that are transferable. Doctors, midwives and neonatal nurses engage in history taking on a regular basis within their daily practice. However, the underlying principles of history taking follow that of all patient groups. Howard (2008) comments upon the role of history taking in establishing trust, which in turn paves the way for the physical examination. Thus, the interpersonal skills of the NIPE practitioner can influence the quality of the history obtained. Mannerisms, eye contact, body language, patience, listening skills and empathy are all key skills that any health care professional requires to obtain a good history. If there is any deficiency in these key skills, the level of narrative imparted by the mother or father to the NIPE practitioner may be negatively affected. Stoeckle and Billings (1987), in their signature work on history taking, refer to the process as a clinical interview, and the way it is conducted will influence the communicative processes necessary to generate the clinical picture.

Parallels can be drawn between history taking for the newborn examination and maternal history taking throughout pregnancy that may illuminate any element of risk to the mother/infant dyad. In addition, engagement of the parents with the history-taking exercise facilitates participation in the decision-making process and the request for consent to conduct the newborn examination (NHS QIS 2008).

It is important to note that in the event of any subsequent admission to hospital for the infant, the first point of reference is the history and newborn examination. In addition, if anything was missed during the examination, e.g. cleft palate, a dislocated hip, then this may result in a complaint and possible legal action (see also Chapter 10). A thorough history can identify potential as well as actual risk of an aspect being overlooked that may later impact upon neonatal and infant outcome.

Concise and thorough history taking will also assist the NIPE practitioner to ascertain if the examination meets the healthy newborn criteria. Some aspects of the history may require midwives or neonatal nurses to refer the newborn to a medical colleague if a more detailed examination is necessary. For this reason, it is vital that maternity units have local guidelines in place to support all health care disciplines who undertake the newborn examination.

Paediatric medicine has long since considered family history as key to the clinical examination process. The family profile is informative when screening for common complex and single-gene conditions but includes isolating genetic predispositions in some families (Green 2007). As a result, several family history-taking checklists in the form of mnemonics have emerged to guide paediatricians. Such systems may be helpful and indeed insightful, but they cannot be fully applied to newborn history taking. However, this does highlight the importance of gathering information in an ordered manner and, most importantly, that the family history must be placed at the centre of history taking for the newborn infant.

Building a history profile: where to start?

When building a history profile, a clear identifiable process can be followed. Assimilation of the perinatal history can be challenging, and therefore the first point of reference is the maternal medical records. However, knowing what to look for and having some order of assemblage in the gathering of information is crucial if the task is to be efficient and not time-consuming. The maternal booking history often yields the most significant information alongside the serology results. The maternal early booking history will, in the main, provide most of the baseline history. This should provide the medical and surgical history of the mother as well as the maternal well-being so far during the current pregnancy.

Reliance upon the maternal medical records alone will not provide all of the information needed. It is therefore necessary to question the mother and/or father on family history to extract those risk factors that parallel the national standards (PHE 2018a).

The NHS Antenatal and Newborn Screening Programme should be used as the benchmark for identifying risk factors for the newborn examination (see Table 1.1). The maternal antenatal screening tests undertaken will provide a framework of investigative results for the NIPE practitioner that will provide the foundation for the history profile.

Evaluation of maternal medical records: biophysical information

The maternal socio-demographic and biophysical details should be assessed. Age must be noted, particularly in the teenage primigravida, as additional health promotion and education by the examiner may be necessary upon completion of the examination. Early and recent evidence suggests that upper and lower margins of maternal age are adversely related to prenatal and perinatal outcome (PHE 2019a). Bornstein et al. (2006) explore this relationship, concluding that varied age groups have differing parenting abilities. Nevertheless, the teenage mothers may require more intensive health promotion advice for themselves, possibly their partners and their newborn infants.

A raised body mass index (BMI) can influence general health and may also indicate the family unit's dietary habits. A positive relationship exists between a raised BMI and complications of pregnancy including diabetes, hypertensive disease and thromboembolic disorders (Bhattacharya et al. 2007; NICE 2010; RCOG 2018). Pregnancy outcome can be affected, resulting in macrosomia, shoulder dystocia at delivery and hypoglycaemia of the newborn (Kalk et al. 2009; Khashan and Kenny 2009). Maternity units must have a policy in place for the prevention, detection and treatment of neonatal hypoglycaemia to identify those newborns most at risk (BAPM 2017).

Previous obstetric and medical history

The medical history can reveal conditions such as maternal hypothyroidism, cardiac disease, type 1 or gestational diabetes, renal disease, epilepsy, blood disorders e.g. idiopathic thrombocytopenia, haemophilia or von Willebrand disease, or maternal

TABLE 1.1 **Key elements of the National Antenatal and Newborn Screening Programme.**

Screening tests	Timing	Biophysical details
Serology investigations		
Blood profile to include group, rhesus and antibodies status and haemoglobin	At booking Antibodies and haemoglobin repeated at 28 weeks	Approximately 15% of the population are rhesus-negative (Salem and Singer 2009). Anti-D immunoglobulin is offered to all rhesus-negative women at 28 weeks' gestation to prevent haemolytic disease in the newborn. Maternal antibodies can also cause haemolytic disease.
Sickle cell	As early as possible, preferably by 10 weeks' gestation	Inherited genetic condition resulting in the red blood cell forming a sickle cell shape. There are variants of this disease that impact on the severity. In cases where women are healthy carriers, the baby's father should be offered screening. The risk of an affected infant is 1:2 where both parents are carriers (PHE 2018b).
Thalassaemia	As early as possible, preferably by 10 weeks' gestation	Inherited genetic condition that affects the production of red blood cells. The genes that make haemoglobin are altered, causing anaemia. This condition takes two forms: alpha and beta (Ryan et al. 2010; PHE 2018b).
Hepatitis B	At booking	Some populations of women are at high risk of hepatitis B infection (HBsAG positive). Transmission of the virus is through sexual contact, vertical transmission or contaminated blood, e.g. needle sharing. Transmission to the fetus can be transplacental. Vaccination of the newborn must be offered to HBsAG positive women and their partners (PHE 2016, 2019b).
HIV	At booking	HIV infection is a retrovirus that causes an alteration of the immune system. The virus infects the CD4 cells or the helper T cells that lower the body's cell-mediated immunity. Infection with HIV-1 can progress to AIDS (Carpenter et al. 2009; PHE 2016, 2019b).
Syphilis	At booking	Sexually transmitted disease with a risk of transplacental transmission (PHE 2016, 2019b)
First trimester combined test	11+2 – 14+1 weeks	Combined screening test with combination of age, blood profile, nuchal scan measurement and other factors (PHE 2018b).
Ultrasonography		
Nuchal translucency	11+2 – 14+1 weeks (part of combined test)	Nuchal translucency measurement greater than 3.5 mm in early pregnancy. This finding is significant as associated with cardiac and syndromic pathology. This finding is also part of the 'combined' screening test for trisomy 21 (PHE 2018b).

(*Continued*)

TABLE 1.1 (Continued)

Screening tests	Timing	Biophysical details
Quadruple test	14+2 – 20+0 weeks	Biochemistry tests, which include AFP, BHcG, oestriols and inhibin A (PHE 2018b).
Fetal anomaly	18+0 – 20+6 weeks	This scan can detect certain gross structural anomalies but does have its limitations. Approximately 45% of cardiac defects can be detected at this time (PHE 2018b).
NIPE National Standards	Within first 72 hours of birth Repeated at 6–8 weeks of age	Full physical and behavioural examination of the newborn incorporating the four-core condition-related screening standards: developmental dysplasia of the hip, examination of the eye, congenital heart defects and undescended testes (PHE 2018a).

Source: Adapted from the NHS Antenatal and Newborn Screening Programmes (PHE 2016, 2018a, 2020c).

depression. The surgical history may not have such a direct impact upon risk for the newborn but does add to the completeness of the history-taking process for the NIPE practitioner.

Previous obstetric histories can provide information regarding maternal well-being and pregnancy outcome that may be of relevance. The health of existing siblings should be noted. A previous intrauterine death, neonatal death or sudden infant death syndrome (SIDS) sibling should be noted. It is good practice to offer the option of an ECG being performed on the new sibling to rule out any risk of cardiac conduction disorders, e.g. prolonged QT syndrome or Wolff–Parkinson–White syndrome. The newborn would also be on the Care of Next Infant (CONI 2020) scheme with the provision of an apnoea monitor prior to discharge.

Intrapartum history

The intrapartum history is important in terms of identifying risk factors for the newborn. If resuscitation of the newborn was required, note the level of support given and time to response. It is also important to note if the newborn required admission to the neonatal unit for ongoing observation.

Taking note of the mode of delivery is important because this may impact upon the health of the newborn. If shoulder dystocia presented during the second stage, the newborn must be thoroughly examined by a senior paediatrician for evidence of a brachial plexus injury, a clavicle fracture or sternomastoid muscle injury. An examination in the immediate post-delivery period by a paediatrician should be part of the maternity service local shoulder dystocia management guideline.

Breech presentation carries a strong correlative risk of developmental dysplasia of the hip (DDH) and is therefore a national NHS NIPE Screening Programme risk factor (PHE 2018a, 2020c). Breech presentation at birth irrespective of mode of delivery, or clinically diagnosed in pregnancy after 36 weeks gestation, or if external cephalic

TABLE 1.2 **Maternal medical records: summarised alert indicators.**

Maternal medical records: alert indicators
Ultrasound scans:
• Polyhydramnios
• Oligohydramnios
• Dilated renal pelves
• Intrauterine growth restriction
• Suspected chromosomal or syndromic aberrations
• Other significant ultrasound screening findings
• Congenital heart defect
Abnormal combined or quadruple test result
HIV positive serology status
Hepatitis B and C
Haemoglobinopathy
Maternal antibodies
Maternal pyrexia in labour
Prolonged fetal tachycardia
Pre-labour prolonged rupture of membranes
Meconium stained liquor
Maternal group B streptococcal infection
Breech presentation
Maternal disease state: type 1 and type 2 diabetes, autoimmune disorders, e.g. systemic lupus erythematosus
Maternal substance use
Maternal alcohol dependency
Thrombocytopenia

version performed for breech presentation irrespective of gestational age at delivery requires referral of the newborn for ultrasound examination of the hips in line with the national NIPE standards (PHE 2018a, 2020c).

A precipitate delivery may cause facial congestion that can be misdiagnosed as cyanosis. An instrumental delivery may result in the newborn suffering a degree of head trauma, such as bruising, which may require analgesia and can increase the risk of hyperbilirubinaemia (see Table 1.2 and Chapter 3).

Meconium stained liquor (MSL) can be problematic for a minority of newborns and therefore must be noted from the delivery summary. The presence of MSL is associated with an increased mortality and morbidity, accounting for 2% of perinatal deaths (NICE 2017). It is relatively common with an occurrence of 15–20% in term pregnancies (NICE 2017). Although meconium aspiration syndrome is relatively rare, some of these infants may seem well at delivery but rapidly develop signs of respiratory compromise as a result of aspiration. The National Institute for Health and Care Excellence (NICE) (2017) advocates close observation of the newborn with MSL present at delivery in the immediate postnatal period.

Early onset neonatal sepsis

Newborn examiners must be continuously on the alert for possible risk factors for early onset neonatal sepsis. Early onset sepsis in the newborn is a significant contributor to perinatal mortality. One of the most common bacterial isolates is group B haemolytic streptococcus (GBS), which carries a mortality of 6% in term infants and 18% in preterm infants (NICE 2017). Maternal infection during the antenatal period must be actively treated with antibiotic therapy. Treatment with antibiotics for the newborn may also be required but is risk dependent or if the newborn is symptomatic (NICE 2012; RCOG 2017). Ohlsson and Shah (2009) inferred that intrapartum antibiotic therapy does reduce the risk of early onset GBS in the newborn.

In the case of pre-labour prolonged rupture of membranes (PROM), the length of time must be noted (NICE 2012). The risk of early onset GBS infection in the newborn is greater in women with PROM (NICE 2012; RCOG 2017). In the absence of any other symptoms, true maternal pyrexia in labour must never be ignored. In addition, there was no strong evidence to recommend antibiotic prophylaxis for newborns of women with PROM in labour (NICE 2012).

Conversely, the symptomatic newborn must commence antibiotic therapy and admission to the neonatal unit for further diagnostics. Every newborn must be treated on an individual basis, depending on the risk factors presenting. Multiple risk factors will necessitate newborn screening for infection and the commencement of antibiotic prophylaxis until blood culture results become available. Local policy on the prevention and detection of early onset sepsis in the newborn must reflect the red flag and non-red flag risk indicators as detailed in the NICE guidance for neonatal infection early onset (NICE 2012) available at https://www.nice.org.uk/guidance/cg149. The NICE guidance advocates the avoidance of routine antibiotic therapy.

It is estimated that 90% of newborns with early onset sepsis will be symptomatic within 12 hours of birth (NICE 2017). Therefore, all newborns with risk factors for early onset infection must receive close observation as indicated on the local neonatal early warning score (NEWS) chart. A framework for the use of the neonatal early warning trigger and track (NEWTT) chart can be found on the British Association of Perinatal Medicine (BAPM) website: https://www.bapm.org/resources/38-newborn-early-warning-trigger-track-newtt-a-framework-for-practice-2015.

The NIPE examiner must ensure that the observations are documented on the NEWS chart and reviewed within the context of the examination and assessment of the overall health of the newborn.

Infant of the diabetic mother

The newborn of the diabetic mother, irrespective of diabetes type, will require blood glucose monitoring. The newborn examiner must review the blood glucose results prior to conducting the examination. Local policy will dictate the monitoring intervals for such newborns. Suboptimal results will require more active management of hypoglycaemia that may necessitate admission to the neonatal unit (BAPM 2017). The BAPM guidance for the identification and management of neonatal hypoglycaemia can be found at https://www.bapm.org/resources/40-identification-and-management-of-neonatal-hypoglycaemia-in-the-full-term-infant-2017.

The NHS Antenatal Screening Programme

Antenatal serology results

The NHS Antenatal Screening Programme components (Table 1.3) aim to help the NIPE examiner navigate investigations and results and signpost the relevant information within the maternal medical records. Familiarisation with the key components of the programme will enhance this process.

The maternal prenatal serology results must be reviewed, particularly the rhesus status. A maternal rhesus negative status or the presence of antibodies should alert the NIPE examiner to the possibility of rhesus incompatibility and the risk of early onset pathological hyperbilirubinaemia with the first 24 hours of life. A sibling of the newborn with neonatal jaundice requiring phototherapy carries a significant risk (NICE 2016). Further information on neonatal jaundice management guidelines can be found on the NICE website: https://www.nice.org.uk/guidance/cg98. Surveillance of the newborn should be increased, particularly in the case of an early discharge to the community.

The maternal human immunodeficiency virus (HIV), hepatitis B and hepatitis C status should be reviewed in all cases. Antiviral therapy will be required for the newborn of an HIV positive mother (PHE 2016; 2019b) in accordance with the national British HIV guidelines (British HIV Association 2019) available from https://www.bhiva.org/file/5bfd30be95deb/BHIVA-guidelines-for-the-management-of-HIV-in-pregnancy.pdf.

The newborn of a hepatitis B positive mother will require vaccination with or without immunoglobulin within 4 hours of birth and follow the hep vaccine schedule for the first year of life (PHE 2016; 2019b) in accordance with the PHE Green Book recommendations (PHE 2014) available from https://www.gov.uk/government/collections/immunisation-against-infectious-disease-the-green-book#the-green-book. Treatment may be required for the newborn of a syphilis positive mother in accordance with care pathway guidance (PHE 2016; 2019b).

A family history of metabolic disease must also be noted following the incident alert with medium-chain acyl-coenzyme A dehydrogenous deficiency (MCADD) (NPSA 2011). If MCADD is known within the family, then the newborn will require early special rapid bloodspot testing at 24–48 hours of age prior to the standard bloodspot screen at 5 days. Further information on newborn bloodspot screening can be obtained from the PHE Newborn Bloodspot Screening Programme website: https://www.gov.uk/government/collections/newborn-blood-spot-screening-programme-supporting-publications and the British Inherited Metabolic Disease Group at http://www.bimdg.org.uk/site/index.asp.

The fetus in focus

Fetal anomaly screening

Ultrasonography in pregnancy is part of the NHS Fetal Anomaly Screening Programme (FASP) (PHE 2018b). Two key ultrasound scans are offered as a minimum standard. The first scan is the early dating scan. It is therefore important to note the gestational age of the newborn from the dating ultrasound scan result prior to conducting the examination.

The second is the 18+0 to 20+6 week fetal anomaly scan (PHE 2018b). Additional serial scans will be performed if an abnormality or abnormal fetal growth is detected,

TABLE 1.3 **Using the maternal obstetric records, newborn records and NHS Antenatal Screening Programme results to create a history profile.**

Creating a history profile					
Maternal medical history	**Antenatal screening results**	**Pregnancy and labour history**	**Family history**	**Psychosocial factors**	**Newborn**
General health status	Serology reports		History of diabetes	Smoking	Resuscitation at birth and time to response
Cardiac disease	Rhesus status	Incidence of infection and bacteria isolate	Intergenerational conditions	Substance use	Method and frequency of feeding
Renal disease	Prenatal screening positive test results	Pathologies, e.g. pre-eclampsia, placental insufficiency	Inborn errors of metabolism	Alcohol dependency	Passage of urine and meconium
Hypothyroidism	Prenatal diagnostic investigations	Mode of delivery and presentation	First-degree relative with CHD	Depression or mental illness	General health and behaviour since birth
Gestational or type 1 diabetes	Prenatal diagnosis of a cardiac abnormality	Pre-labour length of membranes rupture	First-degree relative with DDH	High-conflict relationship	Presence of meconium at birth or risk or early onset sepsis
Nutritional status and BMI	Prenatal diagnosis of a trisomy		First-degree relative with a childhood eye condition	Safeguarding issues with siblings	Parental concerns
Depression or history of mental illness	Ultrasound growth scan profile			Social services involvement with family	Symptomatic of illness

either with the fetus or with the intrauterine environment, e.g. liquor volume or placental positioning. Fetal growth estimation is the primary parameter assessed. The Royal College of Obstetricians and Gynaecologists (RCOG) provides a green-top guideline (RCOG 2013) and the Perinatal Institute offers guidance on fetal growth and the use of growth tools during pregnancy to monitor fetal growth that can be found at http://www.perinatal.org.uk/FetalGrowth/fetalgrowth.aspx.

Evidence of intrauterine growth restriction is not an uncommon finding There may be evidence in the maternal history that may indicate why the newborn is small for gestation age. There may be a pre-existing maternal medical condition that has adversely contributed to placental function resulting in a poor fetal growth profile. Fetal growth restriction may be a feature of an underlying chromosomal abnormality or other pathology, e.g. transplacental viral transmission or the effect of a toxic substance, such as alcohol excess in pregnancy. Further information on the NHS FASP can be obtained from the website: https://www.gov.uk/government/publications/fetal-anomaly-screening-programme-handbook.

The NHS FASP (PHE 2018b) outlines the conditions screened for at the anomaly scan. Whilst it is useful in many cases, it is prudent to accept that this scan does have its limitations; therefore, the focus lies with a standard for 11 structural conditions where the specificity for detection is greater than 50% (PHE 2018b). Conditions screened for are as follows:

- Anencephaly
- Open spina bifida
- Cleft lip
- Diaphragmatic hernia
- Gastroschisis
- Exomphalos
- Serious cardiac anomalies
- Bilateral renal agenesis
- Lethal skeletal dysplasia
- Edward's syndrome (trisomy 18)
- Patau's syndrome (trisomy 13). (Adapted from PHE 2018b.)

The presence of other findings is significant and, as such, is reportable by the ultrasonographer as listed:

- Nuchal fold (greater than 6 mm)
- Ventriculomegaly (atrium greater than 10 mm)
- Echogenic bowel (with density equivalent to bone)
- Renal pelvic dilatation (AP measurement greater than 7 mm) (PHE 2018b).

Fetal renal pelvic dilatation will require serial scan monitoring throughout the pregnancy. However, it is particularly important to note this during history taking and to arrange follow-up ultrasound scans and urology clinic referral for the newborn.

The presence of oligohydramnios must alert the NIPE practitioner to the possibility of the following:

- Prolonged rupture of membranes earlier in the pregnancy
- Urinary tract anomaly or uropathy
- Fetal growth restriction (Baxter et al. 2010)
- Intrauterine infection.

Conversely, polyhydramnios will alert the examiner to consider the following:

- Duodenal atresia or stenosis (Rajiah 2009)
- Oesophageal atresia.

Exposure to the effects of intrauterine teratogens has been investigated and publicised over recent decades, but arguably the most common causes of such exposure is smoking and excessive alcohol consumption during pregnancy.

Smoking in pregnancy

Smoking is the most common substance dependency, yet the most preventable. Reduction in maternal smoking during pregnancy remains high on the public health agenda through smoking cessation initiatives as part of maternity care (NHSE 2016; NHS 2017; NICE 2018c). Clinical guidance can be found on the NICE website at http://www.nice.org.uk/nicemedia/live/13023/49346/49346.pdf. There is compelling evidence highlighting the adverse effects of maternal smoking in both the antenatal and postnatal periods (La Souef 2000; Gilliland et al. 2001; Landau 2001; Stocks and Dezateux 2003; British Medical Association 2004; Bradley et al. 2005). The adverse health implications for the newborn and older children are numerous and can impact upon mortality and morbidity.

Perhaps the most significant, devastating and publicised adverse effect of parental smoking is the increased risk of SIDS (McMartin et al. 2002; Anderson et al. 2005; Matturi et al. 2006; Sellwood and Huertas-Ceballos 2008). The hypothesis surrounding this causal relationship is multifactorial, ranging from respiratory infection susceptibility to altered respiratory control mechanisms (Hofhuis et al. 2003). This positive association cannot be underestimated nor ignored; therefore, the prevention of SIDS is high on the maternity services' health education agenda for the newborn examination. There should be reinforcement of the potential harmful long-term effects of smoking in the postnatal period upon the newborn and into childhood as part of the newborn NIPE health education.

Maternal alcohol consumption

Fetal alcohol exposure from excessive maternal consumption is associated with dysmorphic features and varied neurodevelopmental and behavioural disorders ranging from fetal alcohol syndrome to fetal alcohol spectrum disorders (Disney et al. 2008). Maternal alcohol consumption is often associated with an existing suboptimal social environment (Dawson 2003). The likelihood of domestic abuse may also be greater. The newborn can also suffer withdrawal symptoms from prenatal alcohol exposure that may result in seizure activity (Lall 2008).

Admittance to alcohol consumption during pregnancy in excessive amounts is often retrospective (Jacobson et al. 2002); therefore, intervention and preventative strategies must be put in place for subsequent pregnancies. Disney et al. (2008) reports on the long-standing evidence (Olson et al. 1997; Roebuck et al. 1999) to support altered neurobehavioural abilities in infancy through to antisocial behaviour and attention deficit disorders in children from small amounts of alcohol during pregnancy (Jacobson et al. 2002; Sayal 2007; Sayal et al. 2009). Enquiries into maternal alcohol and units consumed are made by the midwife at the prenatal booking interview. The current social acceptability of alcohol consumption in the United Kingdom may be harbouring an upsurge in a future generation who are affected by prenatal alcohol exposure. Some women, particularly the teenage population, may be engaging in alcohol misuse around the time of conception and beyond until confirmation of the pregnancy. For some newborns, the cessation of alcohol use, even early in the first trimester, may be too late.

Maternal substance use

Maternal substance use signals a probable newborn withdrawal process and a challenge to the health care team in establishing the exact nature of the drugs taken. In the first instance, the NIPE practitioner must establish what illicit drugs have been taken in pregnancy and the immediate pre-labour period. However, obtaining an accurate substance use history is often fraught with imprecise maternal disclosures. Such behaviour can be linked to the social stigmatisation of drug use and the fear of the newborn being placed in care. Sensitive, but direct, further maternal questioning may be required, especially in cases of polysubstance use.

The withdrawal timelines for the common illicit substances have been well documented over recent years. Withdrawal from opiates and heroin can be evident in the newborn within hours of birth, whilst cocaine and amphetamine withdrawal begins within 48 hours of birth (Wang 2010) and withdrawal from methadone does not occur until 48–72 hours of age (Leggate 2008), but it can be as long as 7–14 days before withdrawal is evident (Lall 2008; Wang 2010). The longer half-life of methadone is known to prolong and increase the severity of the withdrawal symptoms. Neonatal abstinence syndrome (NAS) is often considered the foremost adverse condition for the newborn of the substance misuse mother; however, the effects upon fetal brain development have far more significant and long-lasting consequences. Substance use in the first 20 weeks of pregnancy can cause disruption in the cytogenesis and cell migration processes. In the subsequent weeks of pregnancy, cell differentiation and overall brain growth can be disturbed (Wang 2010), including midline defects and congenital heart defects (Mone et al. 2004).

Neonatal abstinence syndrome

NAS indicates multisystem involvement, resulting in a cascade of symptoms. Fetal growth is disrupted, resulting in growth restriction that can independently place the newborn at greater risk of co-morbidity (Smith et al. 2006). Normal neurobehavioural function is altered, resulting in a display of central nervous system instability, abnormal feeding behaviour, respiratory compromise and gastrointestinal symptoms (Volpi-wise 2005; Hamden 2009). Seizure activity can manifest as a late onset symptom of diazepine withdrawal.

NAS can occur with prescribed maternal medication. Morphine-based analgesia for long-term protracted pain management and psychotropic drugs for mental illness are the most common. The social context of the mother requiring morphine for

long-term pain in many cases differs from that of the illicit substance user. Nonetheless, a sensitive approach is required with these parents when reiterating information about the clinical presentation of NAS, as they will have already received information in the prenatal period.

Where maternal substance use is known, it may be prudent for midwives and neonatal nurses to refer the examination to a senior paediatrician because the newborn will require a more thorough examination to assess for withdrawal symptoms.

Risk factors and the newborn examination

Intergenerational traits may indicate an inheritance risk to the newborn. History taking may elicit such conditions (see Chapter 8). However, they may have already been identified in the prenatal period, particularly the haemoglobinopathies, e.g. thalassaemia or sickle cell disease. The NHS national Antenatal Screening Programme performs well in such cases. The NIPE programme provides seven national risk factors that must be applied to by the NIPE practitioner when performing the newborn examination (PHE 2018a, 2020c). Table 1.4 outlines the four screening components from the NIPE Programme Handbook (PHE 2020c) and conditions that carry a predictive risk, as well as other conditions that may have a positive family trait.

It can be argued that some elements of the newborn screening agenda perform poorly in terms of predictive risk based on clinical examination alone. The newborn examination does have its limitations. The most common example is current screening techniques for congenital heart defects (CHDs) (see also Chapter 2). It is estimated that over half of CHDs are not detected in the newborn period (Wren et al. 2007; Sharland 2010). Despite prenatal cardiac screening as part of the fetal anomaly scan and the clinical cardiovascular assessment at the newborn examination, current methods of detection do not compete on merit as an effective screening tool. This is particularly the case for critical duct-dependent anomalies (Abu-Harb et al. 1994; Green and Oddie 2008; Ewer et al. 2012). Sharland (2010) confers that most congenital cardiac anomalies lie within low risk factions. However, a positive family history does correlate with a higher incidence (Romano-Zelekha et al. 2001).

The use of pulse oximetry may complement the clinical examination and may improve the detection rate of critical CHDs for some newborns. There is increasing evidence to support the use of pulse oximetry as an adjunct to the newborn examination (Knowles et al. 2005; Thangaratinam et al. 2007; Valmari 2007; Ewer et al. 2012), thereby increasing the sensitivity of this screening tool overall. See Chapter 2 for further information on the use of pulse oximetry during the newborn examination.

Increased risk of cardiac anomalies related to newborn

- *Sibling*: Recurrence of 2–3% in a subsequent sibling increasing to a 50% recurrence rate in three affected siblings.
- *Parental cardiac anomaly*: 2–5% risk to infant.
- *Maternal diabetes*: 2% risk to infant particularly in uncontrolled diabetes.
- *Drug-related teratogens*: For example, phenytoin, 2% risk to infant (adapted from Sharland 2010).

TABLE 1.4 **Predictive risk factors with potential impact upon newborn outcome including the NIPE Programme national risk factors.**

The four NIPE screening elements and others	Risk factors	Specific condition	Intergenerational trait status
Hips	First-degree relative with DDH (national NIPE Programme risk factor)	Developmental dysplasia of the hips	Positive
	Risk factors: persistent breech presentation or breech delivery (national NIPE Programme risk factor)		Positive
Eyes	First-degree relative with congenital eye condition (national NIPE Programme risk factor)	Congenital cataracts if syndrome associated Glaucoma Retinoblastoma	
Heart	First-degree relative with CHD (national NIPE Programme risk factor)	Congenital heart defect	Positive (dependent on cause)
	Major CHD on fetal anomaly scan (national NIPE Programme risk factor)		
	Previous SIDS	Cardiac conduction mechanism disorders, e.g. prolonged QT syndrome, Wolf–Parkinson–White syndrome	
Testes	First-degree relative with cryptorchidism	Unilateral or bilateral undescended testes – bilateral very significant	Positive

(*Continued*)

TABLE 1.4 (Continued)

The four NIPE screening elements and others	Risk factors	Specific condition	Intergenerational trait status
Significant others	Siblings	Chromosomal aberrations	Positive
	First-degree relative	Genetic disorders	
	Intergenerational	Structural anomalies	
		Syndromes	
		Inborn errors of metabolism	
	First-degree relative	Severe congenital hearing deficit	Positive
		Jaundice treated with phototherapy	
	First-degree relative (sibling)		Positive
	First-degree relative	Atopy:	Positive
		Dermatitis	
		Eczema	
		Epidermolysis bullosa	
	First-degree relative	Asthma	Positive (multifactorial variables – genetic, environmental)
	Intergenerational	Haemoglobinopathies, e.g. thalassaemia, sickle cell disease	Positive
	First-degree relative	Tongue tie	Positive
	Intergenerational	Marfan syndrome	Positive
	Intergenerational/first-degree relative	Myasthenia gravis	Positive

Source: Adapted from the NIPE Screening Programme Handbook (2020c) and cited references.

- *Intrinsic fetal anomalies*: Incidence increased in the presence of other fetal structural or chromosomal anomalies, e.g. the triad of trisomies 21,18 and 13.
- *Transplacental viral transmission*: Increased risk of CHD.
- *Parental consanguinity*: Increased risk of CHD (Ramegowda and Ramachandra 2006; Khalid et al. 2006).
- *Psychotropic drugs*: Teratogenic and newborn effects, e.g. paroxetine may increase the risk of ventricular septal defect, lithium may increase the risk of Ebstein's anomaly.

Other conditions of parental concern

Other common traits within families are atopy and asthma (Moore et al. 2004; Wadonda-Kabondo et al. 2004). These conditions can be of concern to parents and are often raised at the time of the newborn examination. Devereux et al. (2002) reported that maternal environmental factors could influence the fetal immune system and thus neonatal immunity, resulting in an increased risk of atopy and asthma. Similarly, Moore et al. (2004) cited ethnicity, gender, gestational age at birth and family history, particularly maternal, as factors influencing the development of atopic dermatitis within the first 6 months of life. Such findings can confirm the genetic disposition of these disorders.

SMaRT 4 NIPE (S4N)

The NIPE Screening Management and Reporting Tool (SMaRT 4 NIPE) (S4N) IT system aims to identify babies with congenital conditions of the eyes, heart, hips or testes. Initial checks are undertaken within 72 hours of birth as part of the 'head-to-toe' – the 'newborn' part of the physical examination. The purpose of the examination is to identify babies likely to have conditions that may need further monitoring, investigation or treatment. However, as some conditions can develop later, the examination is repeated at 6–8 weeks of age - the 'infant' part of the physical examination.

S4N provides a field containing the six national risk factors mapped to the UK NSC Antenatal and Newborn Screening Programme. The NIPE standards stipulate that 'family history' should be confined to a first-degree relative (PHE 2018a). Additional local risk factors, e.g. BCG vaccination requirement, maternal GBS infection, sibling with jaundice at birth, can be added to the local risk factor menu for each individual maternity unit. Table 1.5 outlines the NIPE Programme national risk factors (PHE 2018a) and an example of additional local risk factors.

The system provides data collection for audit purposes and the provision of key performance indicator (KPI) data against the NIPE National Standards screening elements for quality assurance purposes and local performance monitoring. More importantly, S4N provides a failsafe system and a consistent means of capturing data and tracking newborn babies throughout the screening pathway to ensure that no babies miss out on this detailed physical examination. Provision of a failsafe process for examinations not offered or missed, as well to track children through the health care system, makes it possible to ensure that any required follow-up is timely and in line with national guidance. The safety net for additional screening remains with the examiner at the time of the newborn examination to determine any further element of risk with the clinical assessment.

Use of the NIPE Screening Management and Reporting Tool (S4N) IT system is mandatory (PHE 2018a), provided for use for the NHS by PHE (NIPE Screening

TABLE 1.5 **Summary of defined and national risk factors.**

NIPE Programme national risk factors	Additional defined risk factors
Antenatal diagnosis of a cardiac abnormality	Maternal GBS positive status in current pregnancy/risk of early onset neonatal infection
Antenatal diagnosis of a trisomy	Meconium stained liquor present in labour
First-degree relative with DDH or hip problem in infancy or childhood	Risk of haemolytic disease in the newborn
Breech presentation at birth or after 36 weeks' gestation	Sibling with neonatal jaundice requiring phototherapy
First-degree relative with a cardiac abnormality	Neonatal BCG vaccine required
First-degree relative with a childhood eye condition	

Programme). It is regularly updated to make sure it meets the needs of NIPE practitioners across England. S4N is an IT solution for the recording of all elements the newborn NIPE for all babies born in or residing in England. When the Birth Notification is submitted and an NHS number generated, S4N is automatically populated with newborn baby data records, and it operates via the secure N3 network.

There is a national requirement for the NIPE practitioner to enter screening and post-referral outcome information for the four screening elements of the examination – eyes, heart, hips and testes – to improve programme reporting and assure a safe and effective screening pathway. This also allows local NIPE services to review coverage data and to audit and provide oversight/management of referral outcomes.

All NIPE practitioners should be familiar with and use S4N to record all newborn NIPE screening activity (currently not available to record the 6–8 week examination). Always ensure that data is entered in a contemporaneous way and direct any queries to the Trust NIPE Lead.

More information is available at https://phescreening.blog.gov.uk/2019/07/17/smart-4-nipe-s4n-is-up-and-running/.

The psychosocial and safeguarding agenda

Parental psychosocial influences and adverse lifestyle choices have consistently impacted upon the outcome for newborn infants. Psychopathology morbidity can persist throughout childhood and into adulthood (Hien and Honeyman 2000; Maughan et al. 2001; Dawson 2003; Disney et al. 2008) and mortality in extreme cases (Victoria Climbié Inquiry [Lord Laming Chair] 2003). There are extensive and varied sociodemographic variables that indicate the complexity of the subject matter (see website that accompanies this book for more information on safeguarding). Co-morbidities exist between smoking, alcohol and substance misuse, domestic violence, maternal depression and adverse social environments that place the newborn at greater risk of maladaptive behaviours in childhood and adulthood that replicate that of the parents (Leonard et al. 2007). Therefore, the aim of social support and intervention strategies in the prenatal period and beyond is to break the cycle. See Table 1.6 for a summary of fetal and newborn outcome adverse effects related to lifestyle.

TABLE 1.6 **Maternal/paternal lifestyle and psychosocial influences.**

Lifestyle	Fetal effect	Potential neonatal and childhood outcome
Smoking	Spontaneous abortion Altered placental morphology Chronic hypoxia Intrauterine growth restriction (IUGR)	Abnormal newborn neurobehaviour Increased risk of infant irritability Hypertonia Childhood behavioural problems Lowered immunity SIDS, RSV infection Lower respiratory tract infections Altered pulmonary function Childhood asthma Increased risk of tobacco dependency in adulthood
Alcohol use	Fetal alcohol syndrome (FAS) IUGR	FAS Fetal alcohol disorder spectrum Behavioural problems
Substance misuse	Risk of transplacental transmission of hepatitis B and C Congenital anomalies Symmetrical IUGR Prematurity Meconium liquor	Neonatal Abstinence syndrome
High-conflict relationships: domestic abuse	Intrauterine death Increased risk of acute obstetric complications that impact on newborn outcome	Child abuse Cognitive psychological impairment Childhood depression
Parent in care system		Increased risk of infant in care system Increased risk of child neglect

Sources: Adapted from Hien and Honeyman 2000; Maughan et al. 2001; Dawson 2003; Disney et al. 2008.

Maternal mental health

Maternal mental health and depression should be of significant interest to the NIPE practitioner. The use of psychotropic drugs can affect the newborn in relation to withdrawal symptoms (Wang 2010; NICE 2018a; NICE 2018b). In comparison to withdrawal behaviours in the newborn from illicit substances, the effects from antidepressant medication, particularly the selective serotonin reuptake inhibitors (SSRIs), are perhaps better defined (Sanz et al. 2005; Wang 2010, NICE 2018b). This is very helpful to the NIPE practitioner who is perhaps unsure of the significance of such drugs taken during pregnancy. The following list outlines some associations with the use of antidepressant drug groups:

SSRIs:

- Risk of fetal cardiac anomalies has not been confirmed – conflicting evidence.
- Increased risk of persistent pulmonary hypertension after 20 weeks of gestation.
- Risk of transient neonatal withdrawal syndrome can affect newborns exposed to SSRIs in the weeks preceding birth, causing central nervous system, motor, respiratory and gastrointestinal symptoms (NICE 2018c).

Tricyclic antidepressants (TCAs):

- Limited evidence to suggest that TCAs are associated with an overall increased risk of congenital malformation.
- Neonatal withdrawal symptoms may be associated with TCA use in pregnancy.

Adapted from NICE (2018b).

The NIPE practitioner must firstly establish when the mother commenced the medication and, secondly, check if the mother is still taking medication. There is an associated risk to the mother if she has abruptly stopped taking the medication at any point without seeking medical advice. This is particularly relevant in the immediate postnatal period and may predispose her to active postnatal depression. If the mother is still taking medication, then the newborn must have a thorough neurological examination. There is some debate as to whether withdrawal from antidepressant medication in the newborn is more of a toxicity reaction (Wang 2010) to the drug as opposed to active drug withdrawal, which would increase the severity and prolong the severity of the symptoms.

Maternity services may have local guidelines in place for postnatal observation on newborns of mothers who have been prescribed antidepressant medication in pregnancy, particularly during the latter stages.

The NIPE practitioner can observe the behavioural interactions between a mother and her newborn at the time of the newborn examination. Any concerns about abnormal attachment behaviour must be relayed to the midwife caring for the mother and newborn, in the first instance. The level of concern may necessitate the activation of the safeguarding pathway. Further information about mental health in pregnancy can be found at https://www.nice.org.uk/guidance/cg192/evidence/full-guideline-pdf-4840896925.

Addressing safeguarding issues when reviewing the antenatal history

Public policy, with reference to safeguarding, has rapidly changed the landscape of history taking. Having been brought into sharp focus on a national scale over the last 30 years

since the advent of the Cleveland Report (1988) and the Children's Act of 1989, this issue is high on the agenda within maternity and paediatric services (DfE 2018). Evaluation of the family psychosocial background is an important facet of the newborn examination as in childhood. It is the responsibility of the NIPE practitioner to raise any concerns that have not already been addressed with the safeguarding named midwife. Once this process is activated, the safety of that newborn will become paramount.

Paternal information is often viewed as a lesser priority. However, the father's date of birth is an important demographic in tracing any previous safeguarding issues or domestic violence should concerns be raised. With the date of birth, the police protection services can investigate any previous convictions or concerns. With the movement of some population groups around the country and the fluidity of family units within society, male partners may move from one family unit to another and not disclose any information about previous relationships, e.g. SIDS, congenital anomalies or previous child deaths. It is also important to know the names and dates of birth of other siblings even when not biologically belonging to the mother of the new infant.

It is vital that all aspects of safeguarding are considered and applied during the history-taking process for the newborn examination. Newborns can be subject to safeguarding, and the relevant assessments in the antenatal period can minimise potential harm with the right level of intervention and support (Brandon et al 2016). All significant information must be made available and shared through the use of multiagency protocols including neonatal and paediatric community teams and other multidisciplinary organisations involved in the protection of children in accordance with national and local policy.

Cultural practices can be disclosed during the history-taking process in relation to female genital mutilation (FGM). This practice is illegal in the United Kingdom and is a high priority for safeguarding. The practice of FGM is common in Africa, the Middle East and Asia. It is mandatory for the disclosure of FGM to be reported to the safeguarding named midwife and local safeguarding policy activated and followed. The Department of Health (DfE 2020) provides further information on FGM for health care professionals available at https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/573782/FGM_Mandatory_Reporting_-_procedural_information_nov16_FINAL.pdf.

The NIPE practitioner and maternity staff must be aware of their responsibilities in the safeguarding of children and adults. Lack of communication has been cited as a common and sadly repetitive failing of the 'Safeguarding Children' systems (*The Victoria Climbié Inquiry Report*) (House of Commons Health Committee 2003; CEMACH 2008; Haringey Local Safeguarding Children Board 2008; CQC 2009; NPSA 2009). Further information on safeguarding children can be found at https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/779401/Working_Together_to_Safeguard-Children.pdf.

Parental dialogue and involvement with the newborn assessment process

Women and their partners may already have concerns about their newborn at the start of the examination. These concerns may have a physical or behavioural focus. The history-taking process must include discussion with the parents, if present, prior

to commencing the examination, and they must be invited to share those concerns. Some of these concerns may be delayed until the examination is completed. The dialogue regarding family history or worries demonstrates a collaborative approach to the examination, and many parents welcome the opportunity to engage with this aspect of their newborn's care. The history-taking interview for some parents can be therapeutic because they have a staff member who is more than willing to listen. If the mother or father was adopted, then gaining a thorough family history will be problematic; therefore, a sensitive approach will be required.

The involvement of the parents in such conversations will not only engage them with the examination but also engender an early sense of responsibility for their newborn. Blake (2008) advocates the empowerment of women to examine their newborns, thereby making an active contribution to the assessment of the neonate. This level of participation can enhance the women-centered care experience for many mothers as well as helping to lessen the incidence of abnormalities that are missed at the newborn examination. Many women and their partners examine their newborn in detail and can often be the authority on many aspects of their newborn's external appearance and behaviour.

The culture within maternity care services requires implementation of the concept by Blake (2008) from a health promotion perspective. In the first instance, a timeline exists within those initial stages of newborn care and surveillance where the parents must assume responsibility for the welfare of their newborn. Therefore, they must be advised of the signs of illness and indicators for concern prior to discharge. This could have the following advantages:

- Possible earlier detection of CHD in the postnatal period.
- Probable earlier recognition of illness and a medical review by the general practitioner sought more promptly.
- Potential to prevent SIDS in infants with subtle symptoms of illness.

Currently, maternity services facilitate early and very early discharge options for mothers and newborns, therefore parental awareness of the signs of illness and points of contact must be reprioritised within the health promotion agenda for the newborn examination.

Parental concern arises during the examination in relation to the cosmetic aspects of any minor findings and is often of great significance to them. The practitioner must be able to recognise what is a minor variant in comparison to possible clinical dysmorphology. There are some physical findings that may be a familial trait, e.g. syndactyly or polydactyly. See Table 1.7 for a list of common parental concerns found at the newborn examination. The practitioner must keep an open mind to the possibility of 'subtle' dysmorphic findings indicating a possible syndrome in the presence of other abnormal clinical features. There may be a contextual basis for this result, e.g. familial; therefore, examiners must assess the complete prenatal and postnatal history before seeking a senior paediatric option or expert review.

Interpretation of the information

Aside from the psychosocial skills of history taking, the ability of the examiner to interpret the information being given in a relevant way is just as significant. The history profile is only as good as the facts that are given and acknowledged as pertinent. The

TABLE 1.7 **Common parental concerns at the newborn examination.**

Syndactyly
Polydactyly
Feeding issues, e.g. vomiting
Mild talipes previously undiagnosed on ultrasound scan
Tongue tie
Skin tags
Sinuses
Birthmarks
Pseudo-menstruation
Moulding
Caput
Cephalohaematoma
Birth trauma markings
Intergenerational eczema, dermatitis and asthma
Intergeneration conditions and syndromes
Congenital abnormalities in first-degree relatives

parents of the newborn may not recognise the significance of the questions being asked specific to family history. Some may be unaware of intergenerational traits within the family or of its significance to the newborn. Romitti (2007) commented on the accuracy of reporting family history by relatives. Interestingly, some mothers did not always disclose that they had a previous child with a birth defect; also the nature of the defect was not always accurately named. Socio-demographic variables did influence the accuracy of detail given. However, factual details from the family are often confounded by their own understanding of the condition and their description of the condition or defect when medical terminology is not used. Indeed, they may not be clear on the exact position of the affected member in the family tree. It is not uncommon for a mother or father to contact other family members at the time of the newborn examination to obtain more information about conditions within the family.

As with many families who do have a positive trait for congenital anomalies or conditions, constructing the aetiology of the family from the environmental or genetic predisposition is often difficult. If a detailed family history is needed in the case of a positive intergenerational trait, then it may be desirable for the examination to be conducted by a senior paediatrician.

Importance of location for the newborn examination

The location of the examination is crucial to the quality of the history-taking discussion with the mother or both parents. The postnatal ward is not a benign environment as the majority are bustling and noisy and not conducive to a history interview. Women may not disclose sensitive information in this environment for fear of being overheard by other patients and health care workers. Disclosure of domestic violence within the high-impact family relationship can be prohibited due to lack of privacy. Indeed, the presence of the father or other family members may also prevent disclosures of abuse. Patient confidentiality is paramount within the health service. Equally, noise is a distracting feature for both the examiner and the mother. The maternity services of the

future may need to revise the existing provision for the examination of the newborn to accommodate an environment that provides privacy and quietness.

Electronic as well as written documentation should acknowledge and reflect that a detailed history has been taken. The use of a history proforma to record the pertinent history themes and significant risk factors can be used. The history proforma can then be placed in the newborn's medical records as evidence of the history-taking process along with the documentation from the S4N IT system.

Limitations to history taking

This chapter has addressed the elements of the history-taking assessment to inform the newborn examination. However, there are obstacles that may present and complicate the process (Table 1.8). The two most common problems are time and the environment. These two elements alone can have a significant impact upon the quality and outcome of the history-taking exercise. The workload pressures endured by many newborn examiners impact upon the time available to perform the examination.

There are other barriers that can compromise the quality of history taking. The questioning technique, manner and general communication skills of the examiner can compromise the level of information imparted by the mother or both parents, who may interpret the line of questioning as invasive, particularly at a sensitive time after childbirth. Conversely, they may have something to hide and fear probing questions. The language barrier has become an increasing problem for many minority groups. All maternity units have access to interpretation services and the *Screening Tests for You and Your Baby* booklets are now available in a variety of languages. Mothers with hearing disabilities must also be accommodated with a sign language representative.

The evidence base to support the varied facets of the newborn examination may be developing, but NIPE practitioners must continue to acknowledge the importance of an evidence base to underpin and validate practice. Therefore, practitioners must engage with current empirical evidence and embrace the research process. As the body of midwives and neonatal nurses who are trained to conduct the newborn examination is relatively small in comparison to our medical colleagues, it is important that we contribute to the evidence to take practice initiatives forward.

TABLE 1.8 **Limitations to effective history taking.**

Time constraints in relation to excessive workload
Inappropriate questions
Questioning technique, e.g. manner
Misrepresentation of facts given about family history
Environment in which history is being obtained, e.g. noise
Confidentiality
Lack of privacy
Suppression of disclosure due to partner presence
Equality and diversity issues, e.g. language barriers, understanding, cultural diversity, disability, maternal deafness
Misinterpretation of information given

Conclusion

Good history taking has always underpinned effective medical practice. However, the nature of the history profile has changed through the incorporation of government directives and a public policy agenda. The NHS Antenatal and Newborn Screening Programmes can be mapped to the history-taking process to help guide the NIPE practitioner towards gathering the relevant information. Whilst the maternal obstetric, surgical and medical history remains firmly implicit with the history-taking process, the psychosocial agenda now reflects the challenges facing families coupled with today's parental lifestyle choices. It can be strongly argued that parental psychosocial influences can impact directly upon not only the newborn period but also childhood and adulthood. The newborn examination provides a platform to address some of these issues so that interventional measures can be implemented at an early stage. This may go some way to help direct parents and safeguard the vulnerable newborn, thereby protecting the health of a future generation. History taking remains an active element of the newborn examination. Without it, the clinical validity of the newborn examination itself could indeed be negligible.

This chapter provides an overview and context of the changing and dynamic nature of history taking as part of the newborn examination. The following websites will provide additional specific information and resources:

Clinical condition	Useful website
Congenital heart defect	https://www.nhs.uk/conditions/congenital-heart-disease/
	https://www.gov.uk/topic/population-screening-programmes
	https://www.gov.uk/topic/population-screening-programmes
	http://pathways.nice.org.uk/pathways/structural-heart-defects?fno=1
Developmental dysplasia of the hips	http://www.steps-charity.org.uk/
	https://www.gov.uk/topic/population-screening-programmes
Eye conditions	https://www.gov.uk/topic/population-screening-programmes
	http://www.rnib.org.uk/?gclid=CJOErMnopsACFSXKtAodUEcAWg
	http://www.nhs.uk/Conditions/Cataracts-childhood/Pages/Introduction.aspx
	http://www.nhs.uk/Conditions/retinoblastoma/Pages/Introduction.aspx
	http://www.childrenwithcancer.org.uk/News/retinoblastoma?gclid=CPKz6I3ppsACFabLtAodbBwANA
Undescended testes	http://www.nhs.uk/conditions/undescendedtesticles/Pages/Introduction.aspx
	http://www.nlm.nih.gov/medlineplus/ency/article/000411.htm
BCG vaccination	http://www.nidirect.gov.uk/bcg-vaccination
	https://www.gov.uk/government/collections/immunisation-against-infectious-disease-the-green-book#the-green-book
	http://www.nhs.uk/Conditions/vaccinations/Pages/bcg-tuberculosis-TB-vaccine.aspx
Metabolic diseases	http://www.bimdg.org.uk/site/index.asp

(*Continued*)

Clinical condition	Useful website
NICE and national guidance documents	
Antenatal and postnatal mental health	https://www.nice.org.uk/guidance/cg192
Antibiotics for the prevention and treatment of early onset neonatal infection	http://www.nice.org.uk/guidance/CG149
Neonatal jaundice	http://pathways.nice.org.uk/pathways/neonatal-jaundice?fno=1
Congenital heart defect	http://pathways.nice.org.uk/pathways/structural-heart-defects?fno=1
Reducing differences in the uptake of immunisations	http://www.nice.org.uk/guidance/PH21
Drug misuse – opioid detoxification	http://www.nice.org.uk/guidance/CG52
MBRRACE UK: Saving Lives, Improving Mothers' Care	https://www.npeu.ox.ac.uk/mbrrace-uk/reports
NHS Antenatal and Newborn Screening Programmes	https://www.gov.uk/government/publications/infectious-diseases-in-pregnancy-screening-programme-handbook https://www.gov.uk/government/publications/infectious-diseases-in-pregnancy-screening-care-pathway https://www.gov.uk/government/publications/handbook-for-sickle-cell-and-thalassaemia-screening https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/749742/NHS_fetal_anomaly_screening_programme_handbook_FINAL1.2_18.10.18.pdf https://www.gov.uk/government/publications/newborn-and-infant-physical-examination-screening-standards https://www.gov.uk/government/publications/newborn-and-infant-physical-examination-screening-standards https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/702100/NIPE_Screening_Programme_Newborn_Pathway.pdf https://www.gov.uk/topic/population-screening-programmes/newborn-blood-spot https://www.gov.uk/government/publications/standards-for-nhs-newborn-blood-spot-screening https://www.gov.uk/government/publications/newborn-hearing-screening-programme-nhsp-operational-guidance https://www.england.nhs.uk/wp-content/uploads/2017/04/Service-Specification-No.21-NIPE.pdf
Continuing professional development and education	https://www.e-lfh.org.uk/ https://www.skillsforhealth.org.uk/services/item/22-elearning-healthcare

References

Abu-Harb M, Hey E, Wren C (1994) Death in infancy from unrecognised heart disease. *Archives of Disease in Childhood* **71**, 3–7. Available from: www.fn.bmj.com (accessed December 2019).

Anderson ME, Johnson DC, Batal HA (2005) Sudden infant death syndrome and prenatal maternal smoking: rising attributed risk in the back to sleep era. *BMC Medicine* **3**, 4. Available from: http://www.biomedcentral.com/1741–7015/3/4 (accessed January 2020).

BAPM (2015) Newborn Early Warning Trigger and Track (NEWTT): a framework for practice. Available from: https://www.bapm.org/resources/38-newborn-early-warning-trigger-track-newtt-a-framework-for-practice-2015 (accessed January 2020).

BAPM (2017) Identification and management of neonatal hypoglycaemia in the full term infant – a framework for practice. Available from: https://www.bapm.org/resources/40-identification-and-management-of-neonatal-hypoglycaemia-in-the-full-term-infant-2017 (accessed January 2020).

Baxter JK, Sehdev HM, Breckenbridge MD (2010) Oligohydramnios. eMedicine Radiology. Available from: http://emedicine.medscape.com/article/405914-overview (accessed December 2019).

Bhattacharya S, Campbell DM, Liston WA, Bhattacharya S (2007) Effect of Body Mass Index on pregnancy outcomes in nulliparous women delivering singleton babies. *BMC Public Health* **7**, 168.

Blake D (2008) Assessment of the neonate: involving the mother. *British Journal of Midwifery* **16**(4), 224–226.

Bornstein MH, Putnick DL, Suwalsky JTD, Gini M (2006) Maternal chronological age, prenatal and perinatal history, social support and parenting of infants. *Child Development* **77**(4), 875–892.

Bradley JP, Bacharier LB, Bonfiglio J, Schechtman KB, Strunk R, Storch G, Castro M (2005) Severity of respiratory syncytial virus bronchiolitis is affected by cigarette smoke exposure and atopy. *Pediatrics* **115**, e7–e14.

Brandon M et al. (2016) Pathways to harm, pathways to protection: a triennial analysis of serious case reviews 2011 to 2014; Final report. Department of Education.

British HIV Association (2019) British HIV Association guidelines for the management of HIV in pregnancy and postpartum 2018 (2019 second interim update). Available from: https://www.bhiva.org/file/5bfd30be95deb/BHIVA-guidelines-for-the-management-of-HIV-in-pregnancy.pdf (accessed January 2020).

British Medical Association (2004) *Smoking and Reproductive Life; The Impact of Smoking on Sexual Reproductive and Child Health*. London: Board of Science and Education and Tobacco Control Resource Centre.

CareQuality Commission (CQC) (2009) Review of the involvement and action taken by health bodies in relation to the case of Baby P. https://www.whittington.nhs.uk/document.ashx?id=1660 (accessed February 2015).

Carpenter RJ, Hale BR, Chan Tack M (2009) Early symptomatic HIV infection. eMedicine. Available from: http://emedicine.medscape.com/article/211873-overview (accessed July 2014).

CEMACH (2008) Why children die: a pilot study. London: CEMACH. Available from: www.cemach.org.uk. (accessed January 2020 – now https://www.npeu.ox.ac.uk/mbrrace-uk/reports.

Cleveland Report (1988) *Report of the Inquiry into Child Abuse in Cleveland 1987*. Cmd 412. London: HMSO.

CONI (2020) Website: https://www.lullabytrust.org.uk/bereavement-support/how-we-can-support-you/our-care-of-next-infant-scheme/ (accessed January 2020).

Dawson DA (2003) Methodological issues in measuring alcohol use. *Alcohol Research and Health* **27**, 18–29. http://pubs.niaaa.nih.gov/publications/arh27-1/18-29.htm.

Department for Education (DfE) (2018) Working together to safeguard children. Available from: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/779401/Working_Together_to_Safeguard-Children.pdf (accessed January 2020).

Department for Education (DfE) (2020) Mandatory reporting of female genital mutilation – procedural information. January. Available from: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/573782/FGM_Mandatory_Reporting_-_procedural_information_nov16_FINAL.pdf (accessed January 2020).

Disney EAR, Iacono W, McGue M, Tully E, Legrand L (2008) Strengthening the case: prenatal alcohol exposure is associated with increased risk for conduct disorder. *Pediatrics* **122**, e1225–e1230.

Ewer AK, Furmston AT, Middleton LJ, Deeks JJ, Daniels JP, Pattison HM, Powell R, Roberts TE, Barton P, Auguste P, Bhoyar A, Thangaratinam S, Tonks AM, Satodia P, Deshpande S, Kumararatne B, Sivakumar S, Mupanemunda R, Khan KS (2012) Pulse oximetry as a screening test for congenital heart defects in newborn infants: a test accuracy study with evaluation of acceptability and cost-effectiveness. *Health Technology Assessment* **16**(2), 1366–5278. Health Technology Assessment HTA Programme.

Gilliland, FD et al. (2001) Effects of maternal smoking during pregnancy and environmental tobacco smoke on asthma and wheezing in children. *American Journal of Respiratory Critical Care Medicine* **163**(2), 429–436.

Green K, Oddie S (2008) The value of the postnatal examination in improving child health. *Archives of Disease in Childhood - Fetal and Neonatal Edition* **93**, F389–F393.

Green RF (2007) Summary of working group meeting on use of family history information in pediatric primary care and public health. *Pediatrics* **120**, S87–S100. http://www.pediatrics.org/cgi/content/full/120/supplement_2/s87 (accessed 16 February 2010).

Hamden AH (2009) Neonatal abstinence syndrome. eMedicine. Available from: http://emedicine.medscape.com/article/978763-print (accessed December 2019).

Haringey Local Safeguarding Children Board (2008) *Serious Case Review. Child A. Executive Summary*. London: Haringey Local Safeguarding Children Board.

Hien D, Honeyman T (2000) A closer look at the drug abuse: maternal aggression link. *Journal of Interpersonal Violence* **15**, 503. Available from: http://jiv.sagepub.com/cgi/content/abstract15/5/503 (accessed December 2019).

Hofhuis W, de Jongste JC, Merkus PJFM (2003) Adverse health effects of prenatal and postnatal tobacco smoke exposure on children. *Archives of Disease in Childhood* **88**, 1086–1090. Available from: www.archdischild.com (accessed December 2019).

House of Commons Health Committee (2003) *The Victoria Climbié Inquiry Report*. London: HMSO. http://www.publications.parliament.uk/pa/cm200203/cmselect/cmhealth/570/570.pdf (accessed December 2019).

Howard FM (2008) History-taking and interview techniques and the physician–patient relationship. Global Library of Women's Medicine. Available from: https://glowm.com/resources/glowm/cd/pages/v6/v6c072.html (accessed October 2020).

Jacobson SW, Chiodo LM, Sokol RJ, Jacobson JL (2002) Validity of maternal report of prenatal alcohol, cocaine, and smoking in relation to neurobehavioral outcome. *Pediatrics* **109**, 815–825. Available from: www.pediatrics.org (accessed December 2019).

Kalk P, Guthman F, Krause K, Delle K, Godes M, Gosing G, Halle H, Wauer R, Hocher B (2009) Impact of maternal mass index on neonatal outcome. *European Journal of Medical Research* **14**(5), 216–222.

Khalid Y, Ghina M, Fadi B, et al. (2006) Consanguineous marriage and congenital heart defects: a case–control study in the neonatal period. *American Journal of Medical Genetics. Part A* **140**(14), 1524–1530.

Khashan AS, Kenny LC (2009) The effects of maternal body mass index on pregnancy outcome. *European Journal of Epidemiology* **24**(11), 697–705.

Knowles R, Griebsch I, Dezateux C, Brown J, Bull C,Wren C (2005) Newborn screening for congenital heart defects: a systematic review and cost-effectiveness analysis. *Health Technology Assessment HTA Programme* **9**(44).

La Souef PN (2000) Pediatric origins of adult lung diseases. 4. Tobacco related lung diseases begin in childhood. *Thorax* **55**, 1063–1067.

Lall A (2008) Neonatal abstinence syndrome. *British Journal of Midwifery* **16**(4), 220–223.

Landau LI (2001) Parental smoking: asthma and wheezing illnesses in infants and children. *Paediatric Respiratory Reviews* **2**, 202–206.

Leggate J (2008) Improving pregnancy outcomes: mothers and substance misuse. *British Journal of Midwifery* **16**(3), 160–165.

Leonard NR, Gwardz MV, Cleland CM, Vekaria PC, Ferns B (2007) Maternal substance use and HIV status: adolescent risk and resilience. *Journal of Adolescence* **3**, 389–405. Available from: www.sciencedirect.com (accessed January 2020).

Matturi L, Ottaviani G, Lavezzi AM (2006) Maternal smoking and sudden infant death syndrome: epidemiological study related to pathology. *Virchows Archiv* **449**(6), 697–706.

Maughan B, Taylor C, Taylor A (2001) Pregnancy smoking and childhood conduct problems: a causal association? *Journal of Child Psychology and Psychiatry* **42**(8), 1021–1028.

McMartin KI, Platt MS, Hackman R, et al. (2002) Lung tissue concentrations of nicotine in sudden infant death syndrome (SIDS). *Journal of Pediatrics* **140**, 205–209.

Mone SM, Gillman MW, Miller TL, Herman EH, Lipshultz SE (2004) Effects of environmental exposures on the cardiovascular system: prenatal period through adolescence. *Pediatrics* **113**(3), 1058–1069.

Moore M, Rifas-Shiman MPH, Rich-Edwards JW, Kleinman KP, Camargo CA, Gold D, Weiss ST, Gillman M (2004) Perinatal predictors of atopic dermatitis occurring in the first six months of life. *Pediatrics* **113**, 468–474. Available from: http://www.pediatrics.org/cgi/content/full/113/3/468 (accessed January 2020).

National Patient Safety Agency (NPSA) (2009) *Review of Patient Safety for Children and Young People*. London: NHS.

National Patient Safety Agency (NSPA) (2011) Rapid Response Report – Keeping newborn babies with a family history of MCADD safe in the first few hours and days of life. Safety Alert 2.

NHS (2017) Stop smoking in pregnancy. Available from: https://www.nhs.uk/conditions/pregnancy-and-baby/smoking-pregnant/ (accessed October 2020).

NHS England (NHSE) (2016) Saving babies' lives: a care bundle for reducing stillbirth. Available from: https://www.england.nhs.uk/wp-content/uploads/2016/03/saving-babies-lives-car-bundl.pdf (accessed December 2019).

NHS QIS (2008) Best practice statement: routine examination of the newborn. Available from: www.nhshealthquality.org (accessed December 2019).

NICE (2010) Weight management before and after pregnancy. National Institute of Health and Care Excellence. July. Available from: https://www.nice.org.uk/guidance/ph27 (accessed January 2020).

NICE (2012) Neonatal infection (early-onset): antibiotics for prevention and treatment. National Institute of Health and Care Excellence. Available from https://www.nice.org.uk/guidance/cg149 (accessed January 2020).

NICE (2015) Routine postnatal care of women and their babies. NICE clinical guideline 37. National Institute of Health and Care Excellence. Available from: www.nice.org.uk/CG037 (accessed December 2019).

NICE (2016) Jaundice and newborns under 28 days. National Institute of Health and Care Excellence. Available from: https://www.nice.org.uk/guidance/cg98 (accessed January 2020).

NICE (2017) Intrapartum care of healthy women and their babies. Clinical guideline (CG 190). London: RCOG Press. Available from: https://www.nice.org.uk/guidance/cg190 (accessed January 2020).

NICE (2018a) Antenatal and postnatal mental health. The NICE Guideline on Clinical Management and Service Guidance. Updated edition. Available from: https://www.nice.org.uk/guidance/cg192/evidence/full-guideline-pdf-4840896925 (accessed January 2020).

NICE (2018b) Depression – antenatal and postnatal. Available from: https://cks.nice.org.uk/depression-antenatal-and-postnatal (accessed January 2020).

NICE (2018c) Quitting smoking in pregnancy and following childbirth. Quick reference guide. National Institute of Health and Care Excellence. Available from: http://www.nice.org.uk/nicemedia/live/13023/49346/49346.pdf (accessed January 2020).

Ohlsson A, Shah VS (2009) Intrapartum antibiotics for known maternal group B streptococcal colonization. *Cochrane Database of Systematic Reviews* **3**, CD007467. DOI: 10.1002/14651858.CD007467.pub2. Available from: http://mrw.interscience.wiley.com/cochrane/clsysrev/articles/CD007467/pdf_standard_fs.html (accessed January 2020).

Olson H, Streissguth A, Sampson P, Barr H, Bookstein F, Theide K (1997) Association of prenatal alcohol exposure with behavioural and learning problems in early adolescence. *Journal of the American Academy of Child and Adolescent Psychiatry* **36**(9), 1187–1194. Cited by Disney et al. (2008).

PHE (2014) Immunisation against infectious disease: The Green Book. Available from: https://www.gov.uk/government/collections/immunisation-against-infectious-disease-the-green-book#the-green-book (accessed December 2019)

PHE (2016) Infectious Diseases in Pregnancy Screening: Programme Handbook. July. Available from: https://www.gov.uk/government/publications/infectious-diseases-in-pregnancy-screening-programme-handbook (accessed January 2020).

PHE (2018a) Newborn and Infant Physical Examination Screening: Standards. Available from: https://www.gov.uk/government/publications/newborn-and-infant-physical-examination-screening-standards (accessed January 2020).

PHE (2018b) NHS Fetal Anomaly Screening Programme Handbook. August. Available from: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/749742/NHS_fetal_anomaly_screening_programme_handbook_FINAL1.2_18.10.18.pdf (accessed January 2020).

PHE (2018c) Sickle Cell and Thalassaemia: Screening Handbook. July. Available from: https://www.gov.uk/government/publications/handbook-for-sickle-cell-and-thalassaemia-screening (accessed 14 January 2020).

PHE (2019a) A framework for supporting teenage mothers and young fathers. April. Available from: https://www.gov.uk/government/publications/teenage-mothers-and-young-fathers-support-framework (accessed January 2020).

PHE (2019b) Infectious Diseases in Pregnancy Screening: Care Pathway. July. Available from: https://www.gov.uk/government/publications/infectious-diseases-in-pregnancy-screening-care-pathway (accessed January 2020).

PHE (2020c) Newborn and Infant Physical Examination: Programme Handbook: Available from: https://www.gov.uk/government/publications/newborn-and-infant-physical-examination-programme-handbook/newborn-and-infant-physical-examination-screening-programme-handbook (accessed 23 January 2020).

Rajiah P (2009) Polyhydramnios. eMedicine Radiology. Available from: http://emedicine.medscape.com/article/404856-overview (accessed January 2020).

Ramegowda S, Ramachandra NB (2006) Parental consanguinity increases congenital heart diseases in South India. *Annals of Human Biology* **33**(5–6), 519–528.

RCOG (2013) Small for gestational age fetus, Investigation and Management. Green-top Guideline No. 31. Available from: https://www.rcog.org.uk/en/guidelines-research-services/guidelines/gtg31/ (accessed December 2019).

RCOG (2017) Group B streptococcal disease early onset. Green-top Guideline No. 36. Available from: https://www.rcog.org.uk/en/guidelines-research-services/guidelines/gtg36/ (accessed December 2019).

RCOG (2018) Care of women with obesity in pregnancy. November. Green-top Guideline No. 72. Available from: https://www.rcog.org.uk/en/guidelines-research-services/guidelines/gtg72/ (accessed January 2020).

Roebuck TM, Mattson SN, Riley EP (1999) Behavioural and psychosocial profiles of alcohol-exposed children. *Alcoholism, Clinical and Experimental Research* **23**(6), 1070–1076. Cited by Disney et al. (2008).

Romano-Zelekha O, Hirsh R, Blieden L, Gree MS, Shohat T (2001) The risk of congenital heart defects in offspring of individuals with congenital heart defects. *Clinical Genetics* **59**, 325–329.

Romitti PA (2007) Utility of family history reports of major birth defects as a public health strategy. *Pediatrics* **120**, s71–s77. Available from: http://www.pediatrics.org/cgi/content/full/120/supplement_2/s71 (accessed December 2019).

Ryan K, Bain B, Worthington D, James J, Plews D, Mason A, Roper D, Rees DC, de la Salle B, Streetly A (2010) Significant haemoglobinopathies: guidelines for screening and diagnosis. *British Journal of Haematology* **149**, 35–49.

Salem L, Singer KR (2009) Rh incompatibility. eMedicine. Available from: http://emedicine.medscape.com/article/797150-overview (accessed December 2019).

Sanz EJ, Delas-Cuevas C, Kiuru A, Bate A, Edwards R (2005) Selective serotonin receptor uptake inhibitors in pregnant women and neonatal withdrawal syndrome: a data analysis. *Lancet* **365**(9458), 482–487.

Sayal K (2007) Alcohol consumption in pregnancy as a risk factor for later mental health problems. *Evidence-Based Mental Health* **10**, 98–100.

Sayal K, Heran J, Golding J, Alati R, Smith GD, Gray R, Emond A (2009) Binge pattern of alcohol consumption during pregnancy and childhood mental health outcomes: longitudinal population-based study. *Pediatrics* **123**(2), E289–E296. Available from: http://pediatrics.aapublications.org/cgi/contnent/abstract/123/2/e289 (accessed December 2019).

Sellwood M, Huertas-Ceballos A (2008) Review of NICE guidelines on routine postnatal infant care. *Archives of Disease in Childhood. – Fetal and Neonatal Edition* **93**, F10–F13. Available from: www.fn.bmj.com (accessed January 2020).

Sharland G (2010) Fetal cardiac screening: why bother? *Archives of Disease in Childhood – Fetal And Neonatal Edition* **95**, F64–F68. Available from: www.fn.bmj.com (accessed January 2020).

Skills for Health (2019) *National Workforce Framework for Maternity and Care of the Newborn*. London: Department of Health. Available from: https://www.skillsforhealth.org.uk/?gclid=EAIaIQobChMIlsfvzJvf4wIVBrDtCh2kNA_2EAAYASAAEgIV2fD_BwE (accessed January 2020).

Smith LM, LaGasse LL, Derauf C, Grant P, Shah R, Arria A, Huestis M, Haning W, Strauss A, Grotta SD, Liu J, Lester BM (2006) The infant development, environment and lifestyle study: effects of prenatal methamphetamine exposure, polydrug exposure, and poverty on intrauterine growth. *Pediatrics* **118**, 1149–1156. Available from: http://www.pediatrics.org/cgi/content/full/118/3/1149 (accessed January 2020).

Stocks J, Dezateux C (2003) The effects of parental smoking on lung function and development during infancy. *Respirology* **8**, 266–285.

Stoeckle JD, Billings JA (1987) A history of history-taking. *Journal of General Internal Medicine* **2**(2), 119–127.

Thangaratinam S, Daniels J, Ewer AK, Zamora J, Khan KS (2007) Accuracy of pulse oximetry in screening for congenital heart disease in symptomatic newborns: a systematic review. *Archives of Disease in Childhood – Fetal and Neonatal Edition* **92**, F176–F180. Available from: www.fn.bmj.com (accessed December 2019).

Valmari P (2007) Should pulse oximetry be used to screen for congenital heart disease? *Archives of Disease in Childhood – Fetal and Neonatal Edition* **92**(3), F219–F224. Available from: www.fn.bmj.com (accessed December 2019).

Victoria Climbié Inquiry (Lord Laming Chair) (2003) *Summary and Recommendations*. HMSO.

Volpi-wise M (2005) Neonatal abstinence syndrome. Available from: http://bach.fhs.usyd.edu.austu/hse/iec/volpiwisem/html (accessed July 2014).

Wadonda-Kabondo N, Sterne JAC, Golding J, Kennedy CTC, Archer CB, Dunnill MGS (2004) Association of parental eczema, hayfever, and asthma with atopic dermatitis in infancy: birth cohort study. *Archives of Disease in Childhood* **89**, 917–921. Available from: www.adc.bmj.com (accessed January 2020).

Wang M (2010) Perinatal drug abuse and neonatal drug withdrawal. eMedicine. Available from: http://emedicine.medscape.com/article/978492-print (December 2019).

Wren C, Reinhardt Z, Khawaja K (2007) Twenty-year trends in diagnosis of life-threatening neonatal cardiovascular malformations. *Archives of Disease in Childhood – Fetal and Neonatal Edition* **93**, 33–35. Available from: www.fn.bmj.com (accessed December 2019).