Neonate

Family-centred Care

So, a family is a basic unit of society. According to the Australian Bureau of Statistics, a family is defined as two or more persons, one of whom is at least 15 years of age, who are related by blood, marriage, registered or de facto, lacto adoption, step, or fostering, and who are usually resident in the same household. However, a family is widely recognized as whoever the person says the family is, even if there is no blood relation, and that's how I like to think of a family.

There are many types of families in our contemporary Australian society. A nuclear family is one in which the mother and father and their children live together. Traditionally, the mother was responsible for the nurturing role and the father for the economic resources or income for the family. But this traditional family is evolving into what we now classify as a modern family, in which these roles are reversed or shared equally within the parenting. A two-career family is now considered the norm in Australia, with 62% identifying that both partners are working.

Other families identified in Australia are single-parent families, foster families, blended families, intergenerational families, cohabiting families, gay and lesbian families, single adult families, and adolescent families. However, the birth rates for teenagers have dropped significantly, with only about three percent of births being to mothers under the age of 19. Of course, within these types of families are families that are culturally and linguistically diverse or have other complexities such as domestic violence or coping with disability, illness, or injury.

In addition to providing an environment which enhances the physical growth and health of the family, it also creates the atmosphere that influences cognition and psychosocial growth of the family members. A well-functioning family unit provides its members with support, understanding, and encouragement as the members move through developmental stages. Each family has its own values and beliefs which influence the family's structure, interactions, health care practices, and coping mechanisms. A family's cultural

origins and religious affiliations can shape the values and beliefs within a family.

Family-centred nursing considers the health of the family unit as well as the individual members of the family. The whole family dynamic needs to be considered. Family-centred care has been recognised when caring for children, but it should also be implemented across the lifespan. The principles of family-centred care are similar to person-centred care, being respect and dignity, participation, collaboration, and information sharing. It places the individual and the family unit in the centre of care planning. It aims to empower and develop self-care abilities of the family, and it recognises and prioritises preferences of the individuals or the primary carer in the family.

There are challenges with family-centred care, however, and the application in the clinical setting can be inadequate, especially when clinicians are under stress trying to fulfil their roles or have difficulty in negotiating the power imbalance with the families. So, this is something that we need to continually work towards.

The family partnership model is another model of care when working with families. The aims of this partnership model are to identify and build upon the family's strengths, clarify and manage problems, as well as anticipate any problems. Identifying and harnessing social supports is the key feature in the model. Ultimately, however, the goal of either model is to work with families to explore and facilitate their needs instead of the older medical model of telling people what to do.

A family assessment is an integral component in providing family-centred care. The purpose is to determine the structure, the development (such as whether they have young children or older children), and the function of the family. Initially, a genogram can be used as a tool to assess the structure, size, and type of the family. It's a visual representation of that family unit. Genetic relationships in the genogram can also be used in mapping health issues.

An ecomap is another way that can be used to visually represent how the family interacts with other members of the community environment, including things like employment, schools, sporting, religious affiliations, and any other activities they're involved with. Using both the genogram and the ecomap enables the assessor to identify the beliefs and lifestyle behaviours. This helps identify the strengths within the family. The nurse can then work collaboratively with the family using a strengths-based approach to plan goals and implement

strategies for the family to achieve these goals as a unit or for individuals within that unit.

The roles and functions of a family, the family values, the interaction patterns, coping resources, and the physical health status of a family are all important aspects to explore within the family assessment to give the nurse and healthcare professionals a greater understanding of the impact illness or any other stresses can place on that family unit. It's essential that nurses perform an effective family assessment so that they can plan and provide appropriate nursing care to meet the needs of the child and their family.

When completing a family assessment, it's necessary to form a therapeutic relationship. Nurses have reported feeling uncomfortable when discussing topics such as domestic violence and child abuse, so it is really important that, as nurses, we are aware of our own feelings and prejudices and check ourselves regularly to avoid being judgmental or biased. When approaching any family, the concept of cultural safety, of course, should be considered. Developing an understanding of their individual family's cultural, ethnic, and spiritual perspective will assist the nurse to understand their needs. Ask open-ended questions that can lead to a deeper exploration of these topics to allow for culturally appropriate, safe, and individualized care.

Family-centred care is an upstream approach to health promotion and care. This upstream approach aims to identify problems that can cause issues for an individual or family prior to them occurring.

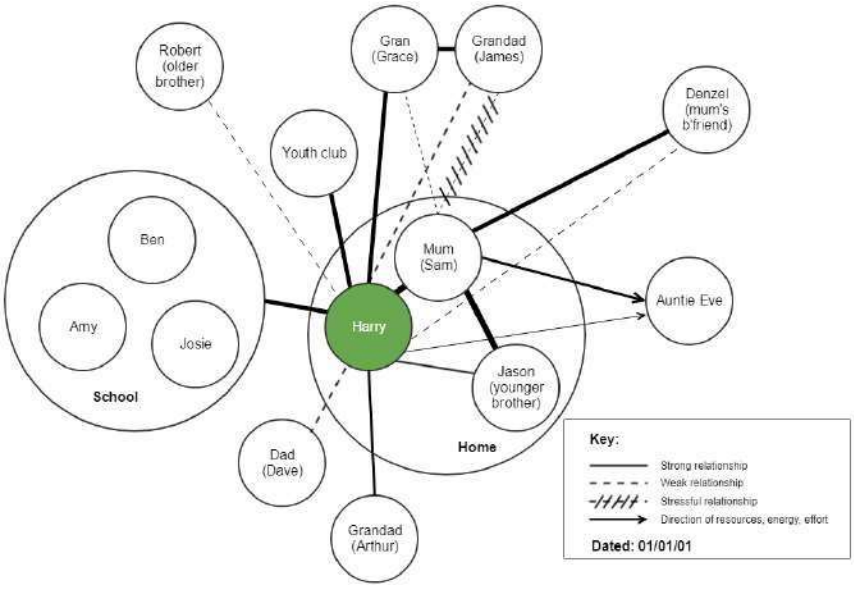
Family Assessment

To provide high standard of family-centred care the health professional needs to understand the roles, functions, strengths and limitations, stressors and coping mechanisms that families experience. There are multiple types of family assessment tools such as the Calgary Family assessment Model however each model will have the same elements included.

- Developmental stage of the family e.g. families with young children
- Roles and functions within the family
- Stressors experienced by family
- Coping strategies used by families
- A visual representation of the family is often used such as a genogram or an ecomap.

A genograms are a diagrammatic map of the family structure to identify each persons relationship within the family unit. Each shape and line represents people and relationships. Some families are very complex

An ecomap explores the families interaction with each other and the community or other external sources.



Newborn Assessment

APGAR Score

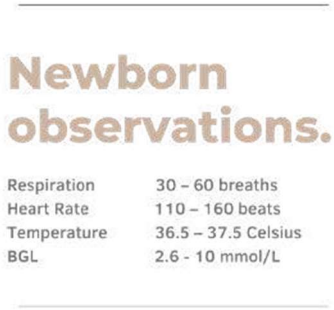
Newborn babies are assessed immediately by allocating an APGAR score. This provides a numerical value of the baby's physiological capacities to adapt to extrauterine life. Each of the 5 signs is assigned a maximum score of 2; the highest score achievable is 10. A score < 7 suggests that the baby is having difficulty adjusting, and a score < 4 indicates that the baby's condition is critical and resuscitation should be considered.

APGAR scoring is usually carried out **1 minute** and **5 minutes** after birth. If the score is low, then it is often repeated a third time at 10 minutes.

THE APGAR SCORE

MNEMONIC	0 POINTS	1 POINTS	2 POINTS
Appearance	blue or pale	blue extremities pink body	body and extremities pink, no cyanosis
Pulse	absent	< 100 beats per minute	>100 beats per minute
Grimace	no response to stimulation, floppy	grimace on suction or aggressive stimulation	cry on stimulation
Activity	none	some flexion of arms and legs	active flexion against resistance
Respirations	absent	weak, irregular and slow	strong crying

Persistent low APGAR scores could result in neurological damage. A paediatric nurse would be alert to the APGAR score when assessing not only the newborn but as the baby grows and develops. Not meeting some of the key milestones we will learn about in future weeks could be a result of these low APGAR scores caused by poor adaptation or distress during delivery.



Physical Assessment

An in-depth assessment needs to be completed on every newborn and documented in their 'Blue Book' or My Personal Health Record. This assessment is usually completed in the first 24 hours of life by a medical professional. It is important for nurses to understand the components of the newborn exam and what is being assessed. This is important as some congenital abnormalities are detected in this newborn exam. Sometimes things can be missed initially, or the nurse may identify anomalies prior to the exam being conducted, especially if working in a special care nursery.

https://youtu.be/xeKvlFn6wjA

The Newborn exam can be seen on page 55 of the My personal Health record,

Newborn Circulation

When a baby is born there is a huge transition from the in utero environment to the 'outside' world. One of the biggest changes occurs in the neonates' circulatory system once the umbilical cord is clamped. Firstly let's review the circulatory system. There are two circuits in the blood flow - the pulmonary circuit where the blood is oxygenated and the systemic circuit where the oxygenated blood is carried to the body tissues.

When a baby is in utero their circulation is different as they are obtaining their oxygen and excreting waste through the placenta and therefore the pulmonary circuit is different.

Fetal Circulation

The fetal circulation is physiologically and anatomically different to a postnatal neonate. There are fetal shunts within the circulatory system which allows the blood to circulate through the placenta. The fetal lungs are essentially non-functional and the liver is only partially functional and therefore the blood is diverted away from these areas through the shunts to deliver the optimal amount of oxygenated blood to the developing fetal brain. The blood travels from the placenta through the umbilical vein to the liver where only a small amount enters the hepatic circulation and the majority is diverted away through the **ductus venous** and into the inferior vena cava. The blood entering the right atrium from the inferior vena cava is of a higher pressure and is then shunted through the **foramen ovale** to the left atrium. From the left atrium blood travels to left ventricle through the aorta with two thirds of the blood traveling to the the head and upper extremities.

Less oxygenated blood returning from the head and upper extremities is returned to the superior vena cava and into the right atrium. A small amount of the returning blood enters the right ventricle and exits via the pulmonary artery and enters the non-functioning lungs. The majority of the blood however bypasses the lungs by flowing through the **ductus arteriosis** and into the descending aorta. This blood then returns to the placenta via the umbilical arteries.

At birth circulatory changes occur with the most important being the change of gas exchange from the placenta to the lungs. As a result of these changes the pressure and volume of blood flowing through the heart chambers changes to functionally **close** the **ductus arteriosis**, **ductus venosus** and the **foramen ovale**.

The **ductus venosus** closes almost instantly the umbilical cord is clamped and the blood flow is reduced and there is usually no shunting through the ductus after 7 days of life.

The **foramen ovale** is functionally closed at birth when the pressure gradients change and push a flap across the opening. This is then 'anatomically closed by about one month of life fibrin tissue permanently sealing the flap. If anything occurs to increase pressure in the right atrium prior to the complete sealing of the foramen ovale such as pulmonary hypertension then the foramen ovale will remain open or reopen.

The **ductus arteriosis** closes more gradually as the oxygen saturations increase vasoconstriction of smooth muscle around the duct which closes the duct at around 15 - 18 hours of life.

Congenital Heart Defects

Congenital heart disease is a general term for any defect of the heart, heart valves or central blood vessels that is present at birth. Most congenital heart disease is multifactorial and arises through combinations of genetic and environmental factors, such as viruses, misuse of alcohol and illicit drugs, as well as some prescription medications for example lithium, and maternal health factors such as diabetes There is an estimated 2,400 babies affected in Australia each year. Congenital heart disease was the underlying cause of 152 deaths (0.1% of all deaths) in Australia in 2017. There were 70 deaths in infants aged under 1 year, which is equivalent to 6.9% of all infant deaths.

Increased pulmonary flow

These are the most common types of the congenital heart defects. Theses defects involve septal abnormalities and or communications between the greater arteries for example **ventricular septal defect (VSD**); **atrial septal defect (ASD)** and **patent ductus arteriosus (PDA**). Blood from areas of higher pressure (left side) to areas of lower pressure (right side). This then increases the amount of blood leaving the right side of the heart and being pumped to the lungs. Often as these lesions are acyanotic they may not be detected until about 4 weeks of age. Infants with larger significant left to right shunting are at increased risk of pulmonary hypertension and congestive heart failure. The infants heart rate, respiratory rate and metabolic rate are all increased due to the high pulmonary blood flow. The infant could have difficulty feeding due to the increased energy required and may not be able to consume enough calories and therefore poor weight gain and growth would be noted. Infants may also appear diaphoretic when feeding.

Surgery is usually required for children with significant lesions. Smaller lesions may not be detected for years and as a result of an audible murmur on auscultation. Even if smaller lesions are detected early, a conservative treatment of waiting until they are older or to see if they close spontaneously may be an option.
If the PDA is significant the infant will have a continuous murmur heard on auscultation, bounding pulses and thrill on palpation. They could also present with signs and symptoms of congestive cardiac treatment option to force the closure of the ductus.

Decreased pulmonary flow

These type of defects involve obstruction to the pulmonary flow and septal communications. Due to the increased pressure on the right side of the heart there is right to left shunting of the blood. This means deoxygenated blood is being circulated around the body. These infants have hypoxaemia and cyanosis. As a result of the hypoxemia, the bone marrow produces more red blood cells to assist in transporting oxygen. Polycythaemia may result which in an above normal red blood cell count. This can lead to increased risk of thromboembolism and clotting factors may become impaired **Tetralogy of Fallot (TOF)** is the most common of these defects and accounts for accounts for 0.5/1000 births in NSW in 2015. The anatomical structure of an infant with TOF has four main features. A large VSD that is high in the septum with an aorta that straddles the VSD. Pulmonary
stenosis and right ventricular hypertrophy are the other two features of TOF. Pulmonary stenosis reduces the blood flow to the lungs resulting in less oxygenated blood returning to the left side of the heart.

When the ductus arteriosus is open the neonates pulmonary flow may be adequate, however when the ductus closes the cyanosis becomes apparent. The common manifestation is sudden cyanosis and dyspnoea. **Tetralogy of Fallot** often called at "Tet spell" which can occur from exertion e.g. crying and feeding or during a warm bath. The infant may also appear mottled. On cardiac ultrasounds or other imaging, the heart is shaped like a boot and ECG will show right ventricular hypertrophy. Surgery is required usually before 1 year of life as the cyanotic 'spells' increase.

Obstructed systemic flow

The defects are conditions when there is an anatomical stenosis or narrowing of a valve e.g. aortic stenosis or a greater artery e.g. coartation of the aorta which causes obstruction to the blood flow. This causes greater pressure on the ventricle and decreased cardiac output.

Coarctation of the aorta (COA) is a narrowing of the aorta that constricts around the time of the closure of the ductus arteriosus. The infant usually presents with congestive cardiac failure due to failure of the left ventricle.

Hypoplastic left heart syndrome (HLHS) is a defect in which the left ventricle is underdeveloped or too small to pump sufficient blood to the rest of the body. Once the ductus arteriosus and foramen ovale close, the right side of the heart can no longer compensate. The neonate will develop decreased cardiac output and shock.

Aortic stenosis is the narrowing of the aortic valve opening which reduces the flow of the blood from the left ventricle. These infants may be asymptomatic except for signs of exercise intolerance and may not present until older.

Mixed defects

Are complex conditions that rely on the mixing of the systemic and pulmonary circulations for survival. The defects have varying degrees of cyanosis and congestive cardiac failure.

Transposition of the great arteries (TGA) is when the aorta is leaving from the right ventricle and the pulmonary artery from the left ventricle. As a result, the deoxygenated blood is pumped around the systemic system and the oxygenated blood continues around the pulmonary circulation. This defect is not compatible with extra-uterine life. The mixing of the blood from the ductus arteriosus and the foramen ovale is required. Mild cyanosis may be seen after birth, which increases after day one when the ducts start to close. The infant will develop tachycardia and tachypnoea and my develop congestive heart failure.

Surgical repair is required in the newborn period for survival were they perform an 'arterial switch' to establish normal heart flow. The early management and surgery is required to prevent neurological damage caused by hypoxaemia and other damage to the lungs and heart. Prostaglandin E is given to the infant to maintain the opening of the ductus arteriosus until surgery can be performed.