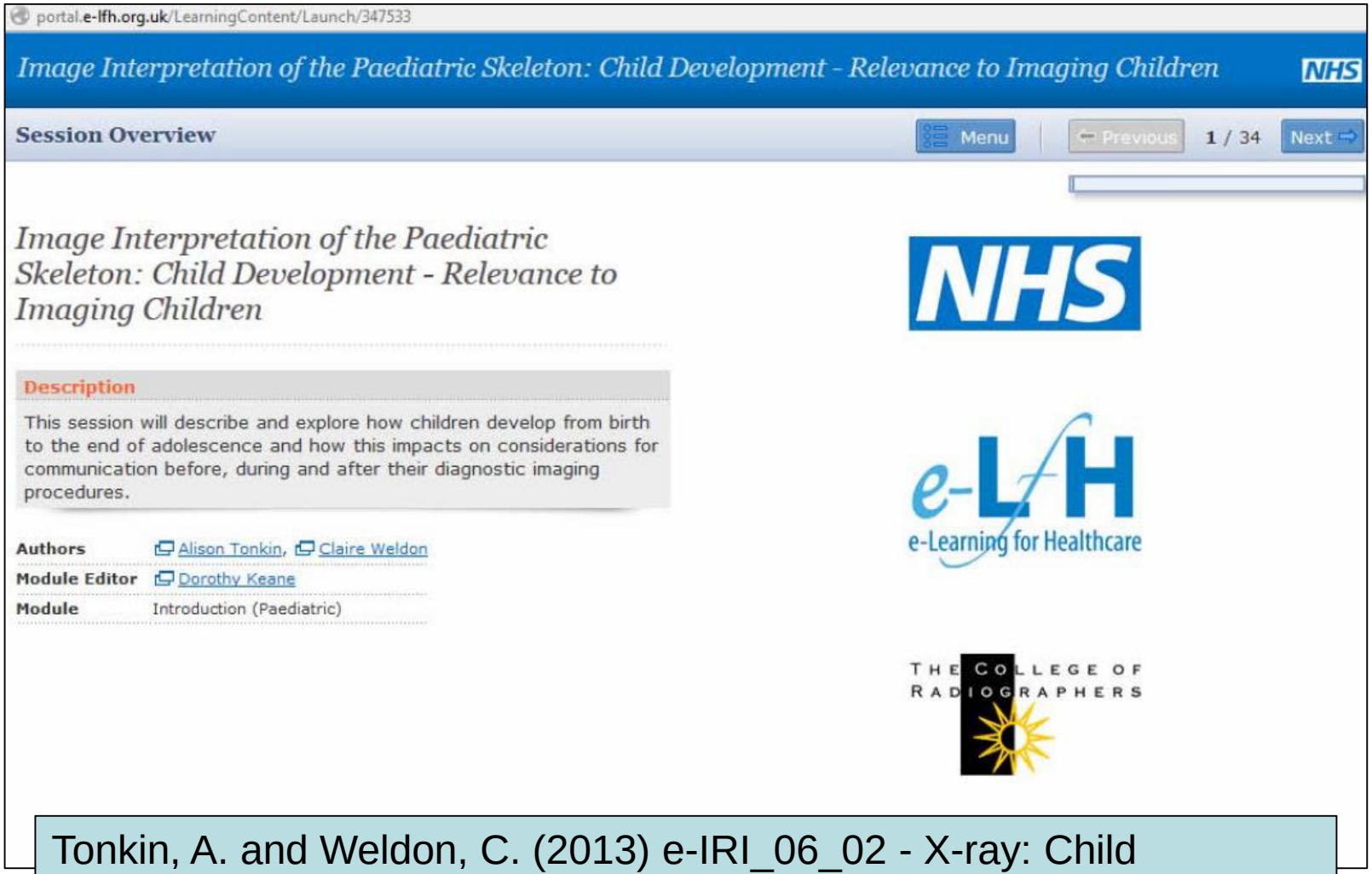
The following presentation is the original PPT version of the following module



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Child development and its relevance to imaging children

Session overview

Description

This session will describe and explore how children develop from birth to the end of adolescence and how this impacts on considerations for communication before, during and after their diagnostic imaging procedures.

Learning objectives

By the end of the sessions you will be able to:

- Describe how children and young people develop from birth to the end of adolescence.
- Identify how different developmental stages may influence children and young people's behaviour.
- Apply developmental considerations to communication strategies that can be used before, during and after imaging procedures.

Background

Understanding the developmental stages of children forms a vital role in education, and will impact on the success (or otherwise) of the imaging procedure. Asking a child to perform a task that is too difficult or belittles them is likely to reduce the chances of a successful procedure and, as every child is different, each child should be treated as an individual.

It should be acknowledged that the success of a procedure relies as much on the interaction between staff and the parent/carer as it does between staff and child.

Examples from the sphere of diagnostic imaging will be used to illustrate the major points and these will include the breadth of imaging practice, such as: accident and emergency, plain films, contrast procedures (including range of administration of drugs and contrast agents), MRI and/or CT scanning.

The following pages have developmental information and factors you may take into consideration when working with children and young people, including issues that may arise and potential solutions and recommendations that may help you.

All children and young people are unique. Although the following tables will help to inform and guide your practice., you should also be aware that children and young people may show signs of regression when faced with stressful experiences and the consequences of illness or injury (Hubbuck, 2009).

Age range (0-10 years)

Factors	Age	Factors for consideration	Solutions
Separation from carers **Being alone**	0-2 years	• Has difficulty expressing anxiety. • Reluctance to be held or touched by an unfamiliar person. • Senses parental stress.	• Ask parents/carers to do as much as possible before and during the procedure e.g. positioning child. • Prepare area in advance. • Explain procedure to parent/child.
	2-5 years	• Difficulty expressing anxiety.	• Explain to child where parent/carer will be if they cannot stay. • Prepare area in advance.
Pain	0-2 years	• Has difficulty localising pain. • Reluctance to be touched/moved area that hurts.	• Check pain relief is sufficient; wait if not. • Adapt procedure if necessary.
	2-5 years	• Can give a basic history and can usually localise area of pain.	• Discuss symptoms to establish relationship.
Overstimulation	2-5 years	• Can be unsettled by unfamiliar sounds/people/equipment. • Difficulty following multiple instructions.	• Reduce number of people involved/in the room. • Reduce noise. • Use familiar items – dummy, comfort toys/blanket.
	5-10 years	• Difficulty processing lots of information.	• Use short sentences. • Don’t give too many instructions in one go.

(Weldon and Weldon, 2012a)

Age range (0-10 years)

Factors	Age	Factors for consideration	Solutions
Change in routine	Birth-2 years	• Has difficulty if needs/routine are not met.	• Be aware of feeding/sleep times and the result of disrupting them.
Fear, expectations and previous experiences	2-5 years	• Fear of pain during procedure. • Fear of the dark. • Fear of the unknown. • Difficulty understanding explanation of procedure as it is an abstract concept.	• Show pictures/preparation books prior to procedure. • Discuss previous experiences. • Clarify understanding/experiences from parent/carer.
Communication	0-10 years	• Understands single words in context. • Uses single words. • Understands simple sentences.	• Speak clearly and use actions to support instructions. • Use a running commentary.
		• Asks questions. • Uses simple sentences. • Follows directions. • Follows others' body language. • Responds to simple instructions. • Retells details of a simple past event in the correct order.	• Show photographs and stories of procedure. • Give clear directions. • Give children 'thinking time'. • Use statements rather than questions. • Give possible answers to questions.
		• Can express knowledge and understanding and ask appropriate questions.	• Give child opportunity to ask questions.

(Weldon and Weldon, 2012a)

Age range (11-18 years)

Factors	Factors for consideration	Solutions
Waiting times	• Poorly managed waiting times can lead to increased anxiety and irritability. • Long waiting times can lead to disruptive behaviour.	• Reduce waiting times if possible. • Display current waiting time. • Recommend bringing an activity to booked appointments.
Compliance	• Fear of procedure. • Misconceptions originating from peers, internet or social media.	• Check understanding of procedure. • Explain procedure. • Send information/factsheets with appointment.
Modesty	• Modesty can be a more important issue for young people than a procedure itself. • Self-conscious about wearing hospital clothing. • Cultural factors – gender, religious. • Age of puberty varies.	• Allow child to change in cubicle away from parents/ others. • Respect privacy. • Recommend bringing suitable clothing from home. Include in information/factsheet.
Consent	• Understanding of procedure and implications. • Consider and present contraindications and interactions of procedure. • Inconsistency in understanding between young person and parent/carer over planned treatment.	• Clarify and document understanding. • Discuss consent issues with young person. • Establish Gillick competence if applicable. • Explain how procedure is in their best interest and supports the long-term treatment process.
Understanding	• Age and stage of understanding may be different. • May not want to admit to not understanding.	• Encourage questions. • Check understanding of procedure and document if necessary. • Send information/factsheets with appointment.

(Weldon and Weldon, 2012b)

5 multiple choice questions - development

1. What could make a child aged between two and five years fearful when coming to the imaging department?

2. Which statement best identifies how to aid communication with children up to 10 years of age?

3. Which age range is most affected by a change in routine?

4. Non-compliance is more likely if (choose the option that is most likely)

5. What can be a more important issue for young people than the actual procedure?

Theoretical perspectives

“Every individual who deals with children has this very human need to make sense of them” (Greig and Taylor, 1999).

Theories are important because they encourage us to look at things from differing perspectives. They also allow us to test things and can help us to predict what might happen in certain situations.

This course is particularly interested in developmental theory and how most children and young people develop through a recognizable pattern of development. This allows you to provide services that acknowledge and respond to the needs of children and young people in a developmentally appropriate manner (Kennedy, 2010).

However, there are other theories that are also important as they can help you to enhance the service you offer. For example, being aware of how to manage the environment will allow you to minimize stress-related anxiety, which may cause variations in behaviour that are hard to manage.

The next section looks at six theorists whose theories are often reflected through your practice. These may help to explain what is happening in certain situations, but also provides things to consider or things you can do to enhance the experience children, young people and their families have when using the services you offer.

Summary table of theorists covered

Theorist	Theory	Key link to practice
Albert Bandura	Social Learning Theory	Role modelling and engagement Interaction between thinking, the environment and behaviour affects how children and young people react to situations they are in
Jerome Bruner	• Stage model of development • Spiral curriculum	Representation of experience changes over time which will define how you engage with, and present information to children and young people
Erik Erikson	Eight stages of psychosocial development that run across the lifespan	How children and young people engage and communicate with you is dependent upon the stage they have 'mastered'
Susan Isaacs	With gentle support and encouragement, children and young people can work out how the world works for themselves	Positive praise and gentle encouragement works better that harsh words and criticism Children and young children learn through practical, hands-on tasks with functioning tools
Jean Piaget	Sequential stage theory for children's cognitive development	Awareness of the differing stages may help to identify the level and type of information children and young children can engage with
Burrhus Skinner	Operant conditioning	Use of positive reinforcement (stickers and certificates)

Theoretical perspectives – Albert Bandura (1925- present)

Bandura's best known theory is Social Learning Theory. This has many sub-elements within it and just three of these are covered here.

Reciprocal determinism	**Self–efficacy**	**Role-modelling**
Our thinking, behaviour and the environment are constantly interacting and changing the way we think and feel. This means that what, how and where we do things are linked together and each will affect the other (Allen and Gordon, 2011).	This is at the centre of Bandura's theory and describes how an individual personally perceives and responds to differing situations. It links observational learning, social experience and reciprocal determination to define the individual's own beliefs as to how well they can manage and succeed on any given task (Allen and Gordon, 2011).	Most human behaviour is learned through observation, which can lead to imitation. The stages leading to imitation are attention (see it), retention (remember it), reproduction (use it) and motivation (have reason to use it) (Allen and Gordon, 2011).
Considerations: An unfamiliar environment may adversely affect behaviour. This can be minimised through small changes to the environment. The influence of the differing factors change according to the age/developmental stage of the child/young person.	**Considerations:** Knowing that the amount of effort someone will put into a task depends on whether or not they think the outcome will be successful. This means alternative strategies may be required to help a child who has previously had an unsuccessful investigation because they did not follow the required preparation It important for young people to be able to contribute to their own healthcare planning.	**Considerations:** When engaging with young people, the way you interact with them will affect the way they interact with you. You may be able to encourage a child or young person to remain still during a procedure or intervention by promoting the use of imitation and role modelling.

Theoretical perspectives – Jerome Bruner (1915- present)

Bruner is a developmental psychologist who has focussed on the construction of knowledge with particular reference to the cultural aspects of learning. Bruner's work emphasises that children are always learning and that through the use of a spiral curriculum, any subject can be taught at any stage of a child's development, provided it is taught in a way the child can engage with. Bruner developed a three-stage model that sought to explain how children's representation of experiences is changed into knowledge in a loosely sequential manner. Unlike Piaget's model, movement between the stages is negotiable and depends on the child's level of experience (Pound, 2005).

Enactive mode (0-1 years)	Iconic mode (1-6 years)	Symbolic mode (7 years and up)	Link to practice
Involves physical action. Knowledge is stored mainly through action or movement, which cannot necessarily be described through pictures or words (Pound, 2005).	Knowledge is stored mainly through visual images and pictures (Pound, 2005).	Experience is represented through a range of symbolic systems such as numbers, words or other types of coding systems. (Pound, 2005).	Bruner's work can be used in a variety of ways to prepare children and young people for investigations and procedures. It be useful to have diagrams or pictures to accompany verbal information

This image is the 'homepage for children and young patients' at University College London Hospitals (reproduced with kind permission). Click on the web link below and explore the differing areas within the site: http://www.childrenandyoungpatients.uclh.nhs.uk/
Bruner's spiral curriculum can fit into the provision of information for children and young people across the differing age ranges.
The variation in iconic and symbolic representation across the differing developmental ages and stages can be seen within this website.

Theoretical perspectives – Erik Erikson (1902- 1994)

Erikson proposed that there were eight stages of psychosocial development that ran across the lifespan. Although he did not identify how development occurred, each stage is defined by a "central dilemma or crisis" (Pound, 2005) that has to be confronted and 'mastered' successfully to enable progression onto the next level. However, 'crises' that are not successfully mastered will not prevent movement through the stages but may cause problems in the future.

Stage	Description (Pound, 2005)	Application in practice
Trust v mistrust (Birth to 1 year)	"The first task is to develop a sense of trust or comfort in their caregivers, environment and self."	Consistent care is important and parental involvement should be encouraged to meet both social and physical needs.
Autonomy v shame and doubt (1-3 years)	"Young children are learning to exercise independence…the child needs to be supported in making choices and decisions."	Encourage exploration of the environment and materials through the use of play. Exposure to appropriate language is important.
Initiative v guilt (3-6 years)	"The young child's developing desire to master the environment."	Assess understanding and provide age-appropriate explanations… increase opportunities for control.
Industry v inferiority (6 years to adolescence)	"Children are keen to master intellectual and social challenges but failures may lead to feelings of inferiority and incompetence."	Provide structured opportunities for preparation – using peer interaction where possible. More emphasis on "being involved".
Identity v identity diffusion (12-20 years)	Young people need to explore their own identity–failure to do so may lead to confusion.	Privacy is very important as are relationships. Where possible, promote control, choice, independence and self-expression.

Theoretical perspectives – Susan Isaacs (1885-1948)

Isaacs believed that children, with gentle support and guidance, could determine how the world works for themselves. Isaacs emphasised the emotional needs of children and taught that "adults should never be sarcastic towards children, or break promises made to them… and their questions should be answered seriously and respectfully" (Pound, 2005). Isaacs was hugely influential in the late 1920s and 1930s and her legacy includes the use of naturalistic observations that focus on children in their natural environment as opposed to assessing them within contrived test situations.

Look at the following features of Isaacs' work: how could these apply in practice?

"Quiet, positive encouragement, showing the child what to do and how to do it is far more effective than scolding or punishment, or emphasis on what he should not do. Successes should be emphasised; failures should be minimised; and above all any feelings of shame or of hostility should be avoided". (Isaacs, cited Pound, 2005)	Isaacs, influenced by the work of Montessori, provided functioning tools and working equipment that could perform the task they were intended for. This enabled children to engage in exploration and encouraged their curiosity through hands-on, practical experiences that were embedded in the real world.

The Kennedy Review suggests that "a lack of training in treating children and young people may lead staff to treat them inappropriately, however unintentionally" (Kennedy, 2010, p.31).
Isaacs' comments above clearly identify that adults need to treat children and young people with respect and honesty.
"You're Welcome quality criteria: making health services young people friendly" (Department of Health, 2011) attempts to address this but giving clear guidance on how staff should provide appropriate services.

Theoretical perspectives – Jean Piaget (1896-1980)

Piaget was interested in how children learn and he developed a sequential stage theory. However, this later proved to be contentious as Piaget believed the child had to fully master one stage before they could progress onto the next. He underestimated children and young people's capabilities through the testing procedures that were used. However, it does provide a useful overview of how children develop their thinking characteristics, if the age bands are treated with a degree of caution (Pound, 2005).

Stage of development	Characteristics (Pound, 2005)	Implications
Sensori-motor (0-2 years)	Learning is developed through physical action and the child's senses.	Environment is key… factors such as noise and touch.
Pre-operational (2-7 years)	Objects are represented by words, supporting play with ideas. Logic rests on incomplete ideas.	Lack of abstract thinking means explanations need concrete examples. Feelings cannot be controlled by reason.
Concrete operations (7-12 years)	Logical thought emerges and experiences are categorised.	Enjoy explanations but these need to be tangible or seen.
Formal operations (12+)	Manipulation of abstract ideas and a systematic approach to solving problems.	Capable of reasoned discussion and see implications. Avoid displaying vulnerability and reasoning may depend on their mood.

Theoretical perspectives – B.F. Skinner (1904-1990)

Skinner is one of the best-known behaviourist theorists. Skinner believed that all behaviour is learned and therefore it can be shaped. Skinner emphasised the positive nature of rewards, believing negative reinforcement to be counter-productive.

Operant conditioning	Breaking things down	Links to other theories
Building on the work done by Pavlov in relation to classical conditioning, Skinner identified how the use of reinforcement could further modify behaviour. If you want encourage the behaviour, a positive stimulus is provided. If you want to discourage the behaviour, a negative stimulus is provided (Pound, 2005).	Skinner identified that children could perform complex tasks that had previously been thought too complicated, if the task was broken down into smaller tasks, with each task being positively reinforced as it was learned (Pound, 2005).	The link to Social Learning Theory has raised awareness of the need to: • Manage behaviour – both in terms of encouraging desired behaviour and conflict resolution • Awareness of how observed behaviour is repeated through positive and negative reinforcement (Pound, 2005).
Considerations: When a child has successfully completed a procedure, you can offer a reward (usually in the form of a sticker or certificate). The 'Beads of Courage' programme use the concept of positive reinforcement to 'reward' successful completion of investigations, procedures or treatment.	**Considerations:** Breaking information down into 'bite sized chunks' when preparing children to undergo a complex procedure may help them to turn the procedure into a manageable task.	**Considerations:** Children (and young people) enjoy received 'rewards' and these can be used by way of role modelling to other children undergoing similar procedures. This may also allow the sharing of experiences in a positive and supportive manner.

5 multiple choice questions - theory

6. What is the main reason for giving a ‘reward’ to children and/or young people?

7. Piaget’s stages of development helps a practitioner to…

8. According to Bruner, children within the iconic mode store knowledge through visual images and pictures. Practitioners should use this information to…….

9. Children and young people learn through imitating the behaviour of significant others’. As a practitioner you may be a poor role model if you…

10. According to Susan Isaacs, adults should never break a promise they make to a child/young person because…

The role of the environment

Bandura described how the environment, our thinking and behaviour are constantly interchanging and the subsequent effect this has on how we feel (Pound, 2005). Providing a positive environment will be beneficial for everyone. This is particularly important when operating within adult facilities.

Article 7 of the European Association for Children in Hospital (EACH) Charter states that “children…shall be in an environment designed, furnished, staffed and equipped to meet their needs” (EACH, 2012). This is also advocated by the Department of Health (2003) who state that “care will be provided in an appropriate location and in an environment that is safe and well suited to the age and stage of development of the child or young person”. So how can you provide an environment that is suited to the needs of children and young people?

“Having posters and glow in the dark stars in the x-ray room, colouring in pages and word searches or a small box of toys in the waiting area can help children gain a ‘sense of belonging’ and keep them occupied. Keeping a pot of bubbles or a flashing pen in your pocket can help to distract impatient toddlers and giving certificates after the procedure can help children leave on a positive note, which will help if future visits are needed. These resources may not be an obvious source of support for young people and it is important to remember that their needs differ (Department of Health, 2011). However, magazines that are appropriate for this age range may help to keep young people occupied” (Tonkin and Weldon, 2012).

The importance of effective communication

Children and young people can often require different communication strategies from adults. “Specific, tailored, age-appropriate methods are needed to communicate with children and young people so that they can understand their illness and the choices facing them”. (Department of Health, 2010, p8).

This is enshrined in law through Article 17 of the United Nations Convention on the Rights of the Child (unicef, n.d.) which states “Children have the right to get information that is important to their health and well-being” and that information should be in a form that children can understand.

Parents/carers can react differently, from how they would at other times, if their child is ill or injured. There are some ‘general rules’ that can be applied when working with children and young people in any setting. However, there are some considerations that need to be made that only apply in a health care setting. Below are some key questions that could be asked before an interaction with a child/young person and their parent/ carer.

Who are you communicating with? Parents/carers, child/young person, professional?	**What** do you want to tell them? About the procedure, other information?	**Where** are you telling them? Waiting room, treatment room, ward?
Why are you telling them? To gain consent, for understanding?	**When** are you telling them? Before, during, after procedure?	**How** will you tell them? Verbally, in writing – leaflets, interpreter?

Language and cultural considerations

Children and young people from ethnic minority backgrounds account for approximately 20% of the population of under 19 year olds in the United Kingdom (Society and College of Radiographers) and therefore it is always important to consider language and culture when interacting with the child/young person and their parent/carer.

“When children and their families require care in hospital or the community, they will act and react within the context of their particular family, community and societal culture. They will assume that we understand "where they are coming from" and why they react as they do. As nurses and health care professionals, we need to ensure that we are equipped with the insight and appropriate knowledge to reduce their stress and carry out culturally appropriate care” (Norton and Watt, 2013).

	Considerations	Solutions
Language considerations	• Level of understanding in own language.	• Utilise translation services. • Adapt information given. • Use resources to assist.
Cultural considerations	• Cultural factors could have an impact on procedure or treatment - gender of staff, languages spoken, body language, fasting, consent.	• Utilise translation services. • Generate a list of languages spoken by staff. • Clarify understanding of cultural preferences.

Age considerations

The age of a child/young person has a huge impact on their ability to understand language and concepts. Certain factors must be in place to ensure that the information is delivered appropriately. Think about whom you will be communicating directly with. Will it be the child, parent/carer or both?

Age	Expected developmental level
By 3 months	Show interest and excitement with facial expression Cry in different ways to show what is needed Smile Look at the person talking
By 6 months	Hold head up and turn it to the person talking React to the tone of a person's voice
By 9 months	Show fear of strangers
By 12 months	Babble with expression Follow simple instructions
By 18 months	Show temper when can't have or do something Say a few words or use gestures to let a person know what is wanted Point to named objects or people
By 2 years	Use lots of words and may join them together
By 3 years	Follow some conversations and use short sentences
By 4 years	Talk in sentences but some sounds are still unclear
By 5 years	Ask and answer who, what, where and when questions
By 6 years	Talk fluently and with confidence

(KMMD, 2013a and b)

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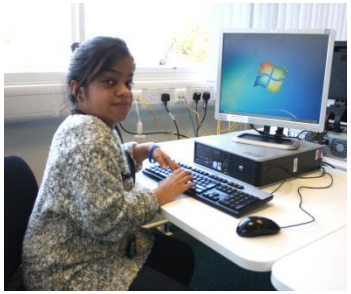

Age	Expected developmental level
7 years	Read independently Observe adults and other children's behaviour Pick up on differences between people and when adults act differently. Find other ways to communicate and find information e.g. internet
8 years	Express my own ideas and ask what if questions Make decisions with extreme options e.g. right or wrong
9 years	Understand that there is an order in how things happen Continue to push boundaries and negotiate rules.
10 years	Research an area of interest Think more widely and consider different view points Question ideas and theories Read a wider variety of books, short newspaper articles
11 years	Want to participate in adult discussions Test the strengths of previously agreed rules (start to say "make me")
12 years	Express more detailed arguments
13 years +	No additional considerations

(KMMD, 2013b)

Communicating – before a procedure

It is crucial to prepare children for a hospital visit, whenever possible. In some cases, where the child or young person attends as an emergency case, detailed preparation for the visit is not possible. However, there are always opportunities to prepare the child/young person for the next event. “The primary goal of preparation is to reduce the fear and anxiety experienced by a child who is undergoing a medical procedure and to promote his or her long-term coping and adjustment to future health care challenges.” (Child Life Council, 2007).

There are many preparation strategies that can be used including: pre-visits, preparation books, leaflets, discussion, internet information and sessions with the Hospital Play Specialist which will help the visit be smoother and more successful. The HPS can discuss the procedure with the child using play-preparations techniques and provide information for the child/young person at an age/stage appropriate level (EACH, 2013).

Consent needs to be obtained for all procedures. Even if consent cannot be legally given by a child, their assent can be gained. In accordance with Article 12 of United Nations Convention on the Rights of the Chid (unicef, n.d.) children and young person should be involved in decisions that affect them and where possible, young people who are Gillick competent should be encouraged to make decisions for themselves.

Gillick Competence

A child/young person is considered to be Gillick competent, and can therefore give consent to treatment, if they are able to make an informed decision about the treatment that they will undergo.

"...*whether or not a child is capable of giving the necessary consent will depend on the child's maturity and understanding and the nature of the consent required. The child must be capable of making a reasonable assessment of the advantages and disadvantages of the treatment proposed, so the consent, if given, can be properly and fairly described as true consent.*" (NSPCC, 2013).

Involving children and young people in decision-making is important. However, an individual's level of understanding varies and is not always the same as their chronological age. Sometimes the decision about whether a child fully understands the procedure they need has to be made quickly so there is not always time to assess the level of understanding.

Guidance from the Department of Health (2010, p.8) also raises the issue of confidentiality, stating "Services should also consider the possibility that Gillick competent children and young people may not wish their parents to know that they are receiving health care or be involved in decisions about the health care they receive".

These decisions can be made in conjunction with the child/young person and their parent/carer but it is important to remember that a child/young person's views should be considered and, if they are Gillick competent, they can give consent (Society of Radiographers, 2005).

It should be noted that Fraser guidelines is only applicable to contraceptive advice (NSPCC, 2012).

Communicating – during and after a procedure

It is often helpful to 'distract' a child/young person during a procedure to help reduce anxiety and any associated disruption. There are a range of methods that can be used. Books such as 'Where's Wally?', bubbles, 'noisy' toys or games may help be useful as would obtaining support from the Hospital Play Specialist. The HPS can accompany a child/young person to a procedure and stay with them, bringing a range of age/stage appropriate equipment that will help with distraction. The Kennedy Review highlights that "…children undergoing painful procedures may require play or distraction therapy in addition to their clinical care. They may require specialist equipment, or staff with specialist training" (Kennedy, 2010, p.64).

Although distracting a child/young person does not make the procedure less painful, it can help to re-focus the child on to something more positive which can help to make the procedure more tolerable.

After the procedure, it may be appropriate to give a 'reward'. These are often appreciated by all children/young people (even those that are in their teens). Discussing what has happened can help reinforce the child/young person's understanding of the procedure, particularly if they need to have it repeated. The HPS can also help with this by providing a post-procedural play session. "Post-procedural play can be used to identify fears and misconceptions following a procedure…. When children have major misconceptions about why they were admitted or what "things" were done to them, post-procedural play enables them to work through these events" (Jun-Tai, 2008).

5 multiple choice questions - communication

11. At what age can a child “pick up on differences between people and when adults act differently”?

12. A child/young person can be considered Gillick competent when…

13. Preparing a child/young person for a procedure helps to…….

14. Distracting a child/young person can be done by……

15. You can minimise the potential effect of cultural and language factors by….

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