Developmental assessment in children

Dr Vanessa Rippon
Outline

• Normal development in children
• What is a developmental assessment?
• Why is it necessary?
• Brief explanation of how to perform developmental assessments
• Questions
• Summary
Normal development

• Pattern is constant
• Skills acquired sequentially
• Rate varies from child to child
• Later goals depend on achieving earlier goal in same field eg. sit before stand, then walk
• Genetic and environmental factors contribute positively and negatively
‘Milestones’

• Acquisition of a key skill
  – Median age – age at which half population acquire the skill
  – Limit – age at which a skill should have been achieved, - 2SD from the mean
  – Remember, some are constant (eg. smile by 8/52), some are not (crawling)
Developmental assessments
Developmental assessments

- Process of mapping a child’s performance compared with children of a similar age from similar population
  - Part of comprehensive medical care

- Brain and CNS development and growth divided into 4 areas:
  - Gross and fine motor skills
  - Social/personal and ADL
  - Speech and language
  - Performance and cognition
Why is it necessary?

- Reassure if normal development pattern and timings, discuss good parenting
- Spot **regression**
- Any genetic disorder to make?
- Identify those with specific areas of impairment or global concerns
  - Allows **early** support or interventions eg. hearing aids, physiotherapy, ?SALT to ensure child reaches their potential
  - Parents time to adjust
Developmental assessment ‘screening’

- Believe the parents if concerned
- Full antenatal, perinatal and postnatal history
- Consanguinity or learning problems in family - recessive or metabolic problem
- Observation of age-appropriate play with toys in clinic
- Examination
Equipment
## Normal milestones

<table>
<thead>
<tr>
<th>Age</th>
<th>Gross motor</th>
<th>Fine motor and vision</th>
<th>Hearing, speech, and language</th>
<th>Social, emotional, and behavioural</th>
</tr>
</thead>
<tbody>
<tr>
<td>6 weeks</td>
<td>Head level with body in ventral suspension</td>
<td>Fixes and follows</td>
<td>Becomes still in response to sound</td>
<td>Smiles</td>
</tr>
<tr>
<td>3 months</td>
<td>Holds head at 90° in ventral suspension</td>
<td>Holds an object placed in the hand</td>
<td>Turns to sound</td>
<td>Hand regard, laughs, and squeals</td>
</tr>
<tr>
<td>6 months</td>
<td>No head lag on pull to sit; sits with support; in prone position lifts up on forearms</td>
<td>Palmar grasp of objects; transfers objects hand to hand</td>
<td>Vocalisations</td>
<td>May finger feed self</td>
</tr>
<tr>
<td>9 months</td>
<td>Crawls; sits steadily when unsupported and pivots around</td>
<td>Pincer grasp; index finger approach; bangs two cubes together</td>
<td>2 syllable babble, non-specific—consonant-vowel, such as “mama”</td>
<td>Waves bye bye, plays pat-a-cake; indicates wants; stranger anxiety emerging</td>
</tr>
<tr>
<td>12 months</td>
<td>Pulls to stand; cruises; may stand alone briefly; may walk alone</td>
<td>Puts block in cup; casts about</td>
<td>One or two words; imitates adults’ sounds</td>
<td>Imitates activities; object permanence (the understanding that objects still exist when they cannot be seen) established; stranger anxiety established; points to indicate wants</td>
</tr>
<tr>
<td>18 months</td>
<td>Walks well; runs</td>
<td>Builds tower of 2-4 cubes; hand preference emerges</td>
<td>6-12 words</td>
<td>Uses spoon; symbolic play—“talking” on telephone; domestic mimicry—“helps” in household chores like sweeping, wiping surfaces</td>
</tr>
<tr>
<td>2 years</td>
<td>Kicks ball; climbs stairs two feet per step</td>
<td>Builds tower of 6-7 cubes; does circular scribbles</td>
<td>Joins 2-3 words; knows some body parts; identifies objects in pictures</td>
<td>Can remove some clothes</td>
</tr>
<tr>
<td>3 years</td>
<td>Stands briefly on one foot; climbs stairs one foot per step</td>
<td>Builds tower of 9 cubes; copies a circle</td>
<td>Talks in short sentences that a stranger can understand</td>
<td>Eats with fork and spoon; puts on clothing; may be toilet trained</td>
</tr>
</tbody>
</table>
Normal milestones – gross motor

**The Motor Sequence**

- **Fetal posture**: 0 mo.
- **Chin up**: 1 mo.
- **Chest up**: 2 mo.
- **Reach and miss**: 3 mo.
- **Sit with support**: 4 mo.
- **Sit on lap grasp object**: 5 mo.
- **Walk when led**: 11 mo.
- **Crawl**: 13 mo.
- **Stand holding furniture**: 15 mo.
- **Sitting alone**: 16 mo.
- **Stand alone**: 18 mo.
- **Walk alone**: 24 mo.
‘Red flags’

- Any loss of skills at any age
- Not fixing or following an object
- Hearing loss
- Low muscle tone / floppy or increased muscle tone
- No speech by 18 months
- Persistent toe walking
- Can’t sit unsupported by 12 months
- Can’t walk by 18 months (male) or 2 years (female)
- Hold object placed in hand by 5 months
- Point at object to share interest with others by 2 years
Summary

• Brief developmental assessment should be part of every health consultation – early intervention improves outcome

• Learn some normal milestones and ‘red flags’

• Practice with every child you meet
**Suggested opportunistic screening questions**
- Do you have any concerns about the way your child is behaving, learning, or developing?
- Do you have any concerns about the way he or she moves or uses his or her arms or legs?
- Do you have any concerns about how your child talks and understands what you say?
- Does your child enjoy playing with toys? Describe what he or she does while playing.
- Has your child ever stopped doing something he or she could previously do?
- Does your child get along with others?
- Do you have any concerns about how your child is learning to do things for himself or herself?

**Environmental causes of damage to brain development**
- **Antenatal**
  - Early maternal infections, such as rubella, toxoplasma, cytomegalovirus
  - Late maternal infections, such as varicella, malaria, HIV
- **Toxins**—for example, alcohol, pesticides, radiation, smoking
- **Drugs**—for example, cytotoxics, antiepileptics
- **Postnatal**
  - Infections—for example, meningitis, encephalitis, cytomegalovirus
  - Metabolic disorders, such as hypoglycaemia, hyponatraemia, dehydration
  - Toxins—for example, lead, mercury, arsenic, chlorinated organic compounds, solvents
  - Trauma, especially head injury
  - Severe understimulation, maltreatment, or domestic violence
  - Malnutrition, especially deficiency of iron, folate, and vitamin D
  - Maternal MH concerns esp depression