Touch and the Development of Hand Function: An Introduction
Lesson Purpose

It stands to reason that children who are visually impaired or deaf-blind would be more reliant on touch or their tactile sense to experience the world. These children have different needs and require different skills related to their use of touch in learning. Unfortunately, many of us don’t know all that much about how to help these children develop better tactile skills and make better use of their tactual sense.

This lesson focuses on the importance of touch and the development of hand function for children and youth who are deaf blind, blind or severely visually impaired. It also addresses issues of touch and the development of hand function for children who are deaf-blind or visually impaired and also have multiple physical disabilities.

The goals of this lesson are to introduce:

- information about the skin as a sense organ
- the proprioceptive system
- the role of touch in bonding and cognitive development
- the role of negative touch in tactile defensiveness
- the roles of the protective system and the discriminatory system
- the overlap between the protective system and the discriminatory system
- the potential for tactile defensiveness when the protective system takes on functions of the discriminatory system
- the role of haptic touch (active use of touch) in acquiring concepts and information
- the importance of allowing children to use other parts of their bodies for touching
- the role of various forms of exploratory touch in acquiring specific types of sensory information about objects and the environment
- the importance of touch to individuals with deaf-blindness and severe visual impairment in acquiring information
- the increased complexities for using and receiving touch if an individual is deaf-blind or
severely visually impaired and also has significant physical disabilities.

- the vulnerability associated with touch experienced by individuals with deaf-blindness or a severe visual impairment who also has significant physical disabilities.

- thirteen recommended strategies for the development of hand function

Lesson References and Guidelines

Two resources were used to develop this lesson:


Much of the content included in this lesson was taken directly from these two resources.

As you proceed through the lesson, be sure to read the explanatory text provided on the left that provides more specific information related to the illustrations!

Also be sure to take the Self Checks embedded in the lesson.

Skin: Our Largest Organ
Our Hands: The Primary Vehicle for Receiving Input From Touch
Fingers: The Most Sensitive Part of the Hand

http://yiquan.chinamartialarts.net/yu2.htm
In the tip of your little finger are . . .

- 9 feet of blood vessels
- 600 pain sensors
- 36 heat sensors
- 76 pressure sensors
- 4 oil glands
- 9,000 nerve endings

No wonder our fingers are so sensitive!!!
Tactile receptors in joints, tendons, muscles, and limbs help form the proprioceptive system

The Critical Nature of Early Touch
The Critical Nature of Early Touch
The Critical Nature of Early Touch

Without touch, children don’t thrive

Positive touch promotes health and well-being
Negative Touch

Touch is:

- the most intimate of senses
- a reciprocal sense
- the most vulnerable of the senses
Positive Touch

Negative Touch

- can lead to tactile sensitivity

Positive Touch
Positive Touch

- can lead to trust and later to a willingness to explore new things tactiley

Perceiving Touch: The Protective System & The Discriminatory System
The Potential Overlap of the Protective System & the Discriminatory System
Active Touch -- *Haptic Touch*
Learning Through Touch

By Mike McLinden & Stephen McCall

- active use of touch = “haptic touch”
- information gained:
  - vibration,
  - surface texture,
  - wetness/dryness,
  - surface temperature,
  - shape,
  - slope,
  - curve,
  - hardness/softness,
  - weight,
  - elasticity,
  - pliability

Types of Touch
Types of Touch

**Active Touch**
- rubbing hands together
- pounding on a table

**Inactive Touch**
- warm sun
- cool breeze
- vibrations of rap music

**Interactive Touch**
- hugging, kissing

**Non-Interactive Touch**
- bathing
- resting hands in lap
- massage
Other Ways to Touch

Passive Touch
- simply places hand on cat
- learn the cat is soft, warm, vibrates when it purrs
- don’t learn as much

More Active Touch
- explore cat from head to tail
- learn about shape, size, parts, movement, weight
- learn pain from teeth and claws

https://courseware.ku.edu/courses/1/SPED661-SPED731-001/c...
Hand Use: Early Strategies

Exploration with lips, tongue, teeth . . .

. . . or feet
Increased Exploration with Hands

- reach
- grasp
- bang
- bat
- take apart
- put together
- use objects

Acquiring Sensory Information: Exploratory Procedures for the Hands
<table>
<thead>
<tr>
<th>Exploratory Procedure</th>
<th>Sensory Information Acquired</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lateral Motion (rub finger across surface or object)</td>
<td>Texture</td>
</tr>
<tr>
<td>Pressure (squeeze or poke object)</td>
<td>Hardness</td>
</tr>
<tr>
<td>Static Contact (fingers rest on object surface)</td>
<td>Temperature</td>
</tr>
<tr>
<td>Enclosure (hold/grasp object)</td>
<td>Shape, Size, Volume</td>
</tr>
<tr>
<td>Unsupported Holding (hold object in hand)</td>
<td>Weight</td>
</tr>
<tr>
<td>Contour Following (trace around object with fingers)</td>
<td>Global Shape, Exact Shape</td>
</tr>
</tbody>
</table>


Cognition: The Role of Hand Use
Hand use leads to cognitive development

Touch & Individuals With Deaf-blindness
Individuals with deafblindness need to touch to learn about what others do.

Their world reaches only as far as their fingertips.

They develop concepts and form relationships through touch.

Impact of Impaired Touch
◆ When touch is impaired because of:
  • motor problems,
  • missing or malformed limbs, or
  • prolonged restraining by IV lines,

  an individual is denied a great deal of information about how their world works.

◆ Leads to cognitive delays

Children with Deaf-blindness or Blindness & Multiple Physical Disabilities:

Vulnerability to Touch
Check Yourself

Before continuing to the final part of this lesson, which addresses developing hand function, complete the three (3) Items below.

- DragNDrop Activity
- DragNDrop Activity
- Self Check
Developing Hand Function: A Key Goal

Developing Hand Function

If hand function is so important, what can we do to help learners who are blind and deaf-blind to develop these critical haptic skills? Although there is very little research-based guidance on what we should do, current best practice gives us some guidelines.

The next three pages offer thirteen recommended strategies

As you read each best practice strategy below - think of an actual examples that you can contribute so that you can contribute to a wiki of examples

Honor the child’s hands. Do not grab or hold the
Build trust between you and the child so that he/she is inclined to trust you not to try to control what he/she does with his/her hands.

**Watch what the child does with his/her hands.**
When we look at what the child does with his/her hands, we can have a better understanding of what the child might know about the world.

**Use a hand-under-hand approach in guiding the child or modeling actions with your hands.** This also means offering objects to the child by bringing them up underneath his/her hand rather than taking the child's hand to the object.

**Watch what a child can do with his/her hands.** This can be done through formal assessment and informal observation. There are a number of tools programs can use to assess the haptic sense and hand use in children with visual impairment and deaf-blindness. Some assessment tools that are used frequently in the United States include the Callier-Azusa Scale, Functional and Instruction Scheme, Home and School Inventories or Problem-Solving Skills, and the INSITE checklist.

**Give the child objects that encourage the development of skills.** For example, if you want the child to develop finger isolation, give him many different objects that encourage that skill, such as metal washers and nuts, wire whisks, loose knit fabric, rings or sections of tubing, containers with holes in them, and so forth. Expand skills horizontally (letting him practice this skill with many different objects) before trying to achieve higher-level skills.

**Developing Hand Function**

**Provide the child with many**
opportunities each day to explore a wide variety of objects on his/her own. These should have different textures, weights, temperatures, shapes, flexibility, and hardness. Most of the Active Learning theory focuses on this approach. If the child's hand use is limited by other disabilities, we need to make sure that things come to his hands.

Make your hands available to the child for him/her to be able to tell you something or show you something. A nice way to do this is to simply hold your hands out to the child with the palms facing up. Let the child take your hand and guide it where he/she wants.

Model hand-use for the child as you do things. This is typically done using hand-under-hand approach as you complete everyday activities such as opening, closing, twisting, rubbing, reading Braille, signing and so forth. The child can learn a great deal about hands from "watching" what you do with your hands.

Let the child know you are experiencing the object he/she is experiencing. Co-actively touching objects that the child is touching is the equivalent of using a pointing gesture to reference an object that the child is looking at. This allows the child to share information with you about the object.

Play hand games with the child. Begin by imitating what the child does with his/her hands. As time goes on and the child begins to attend to what your hands are doing introduce new actions or movements. Clap, wiggle fingers, shake hands, rub them on a surface; any interaction the child is interested in will work.

Developing Hand Function

Offer many hands-on learning experiences with real objects. Avoid the use of miniatures or replicas.

Provide more time for the child to explore objects within activities. What we can quickly take in with our vision requires more time to learn with our tactile sense.

Create object books and boxes for a child to "recall" an event they have experienced by
exploring materials associated with that activity. For example, a trip to McDonald's might be recalled by exploring a collection of objects such as a straw, a french fry, cup, a toy surprise, and a sticky napkin.

This is the end of the lesson.

Be sure you have completed the items that proceed the final section on the development of hand function.

Be sure you have thought about ideas for each of the 13 recommended strategies for developing hand function.