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## **T-GAP**

# **Administration and Scoring Manual for the Thumb Grasp and Pinch Assessment**

**Wendy A. Tomhave, OTR/L<sup>a</sup>**  
**Kathleen M. Kollitz, MD<sup>c</sup>**  
**Ann E. Van Heest, MD<sup>b,a</sup>**  
**Steven L. Moran, MD<sup>c,a</sup>**

### **Shriners Children's - Twin Cities<sup>a</sup>**

215 Radio Drive  
Woodbury, Minnesota, 55125  
612-596-6100

### **University of Minnesota<sup>b</sup>**

2450 Riverside Avenue South  
Minneapolis, Minnesota 55454  
612-884-0600

### **Mayo Clinic<sup>c</sup>**

200 First Street SW  
Rochester, MN 55905  
507-284-2736

### **Correspondence:**

Wendy Tomhave, OTR/L  
[wendytomhave@gmail.com](mailto:wendytomhave@gmail.com)

Steven Moran, MD  
[Moran.steven@mayo.edu](mailto:Moran.steven@mayo.edu)



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## **T-GAP Test Description**

The thumb grasp and pinch assessment (T-GAP) is a participation measure developed to rate the hands ability to formulate grasp and pinch during nine object manipulation routines. The T-GAP provides a new perspective that grades hand dexterity based on the skill level of grasp and stabilization rather than measuring timed speed, which is the focus of timed dexterity assessments. The T-GAP was standardized in 2018 for construct and concurrent validity as well as inter and intra rater reliability.

The T-GAP was developed to understand how the hand formulates grasp in children with congenital thumb hypoplasia who have absent or weak thumb musculature. The T-GAP includes nine tasks based on developmental stages of hand function for three different age groups: 18 months to 4 years, 5 to 7 years and 8 to 18 years. The tasks were selected using activity analysis for nine specific object manipulation routines to elicit large grasp, medium grasp, small grasp, lateral pinch, tip pinch, tripod pinch, manipulation, resistance, school and ADLs. The tasks are video recorded during a 5-10-minute semi structured play session and scored during a subsequent viewing. Experienced raters can score the T-GAP during the assessment.

Each of the nine tasks are scored using an eight-point hierarchical scale ranging from the most primitive grasp styles which do not include the thumb (0-3 points) to more sophisticated patterns that engage the thumb in distal patterns of radial digital opposition (4-7 points). Scoring involves the use of grasp style photo examples, written descriptions and variant patterns which occur less frequently. The T-GAP total score is calculated as the sum of all 9 tasks and has a theoretical range of 0-63 with a higher score indicating a higher thumb opposition skill level. In addition, the T-GAP measures whether the hand is able to formulate a variety of grasp styles and the frequency of thumb use during specific grasp and pinch tasks.

## **Background**

Children with mild radial longitudinal deficiency may have functional deficits in the thumbs ability to reach across the palm or oppose the fingers. The most severe form is absence of the radius and thumb, which requires grasp and pinch adaptations by scissoring or flexing the fingers to hold and stabilize objects. Often the goal of hand therapy and hand surgery in children with radial sided hand involvement is to provide a child with a strong, opposable thumb that can be used in multiple grasp and pinch activities. Evaluating the effectiveness of therapy and surgery for thumb absence or weakness are not fully understood, as previously there were no validated outcome measures to grade dexterity based on the skillfulness of hand grasp and thumb use.

## **Purpose and Development**

In 2005, a surgeon-therapist team at Mayo Clinic, Rochester, Shriners Children's - Twin Cities and the University of Minnesota, developed an assessment protocol to evaluate hand function in children with congenital radial longitudinal deficiency with thumb hypoplasia. The most commonly reported assessments to study outcomes in the population include hand strength, range of motion and dexterity which were included in our protocol. The dexterity assessments include the Box and Blocks Test, the Nine Hole Peg Test, the Functional Dexterity Test and the Jebsen Taylor Test of Hand Function. These assessments measure the amount of time it takes the hand to quickly and repetitively manipulate blocks or pegs. Use of several dexterity assessments can challenge the hand in different ways but they do not determine whether or how the thumb is used to complete the task. To address this need, we developed the T-GAP as part of our thumb assessment protocol, which has been our standard of care to measure children's hand function.

The T-GAP was developed and modeled after the Unilateral Below Elbow Test (UBET) by one of the lead developers. The T-GAP includes half of the original UBET tasks selected by an expert panel of 10 pediatric occupational therapists in 2000 for the evaluation of congenital upper limb transverse deficiency. The T-GAP hierarchical scale was developed to rate the hands ability to formulate grasp and pinch in children with congenital thumb hypoplasia. The scale is based on developmental principles of hand skills and includes grasp style nomenclature that excludes the thumb which was missing in the literature.

## **Hand development**

The T-GAP scoring hierarchy is designed to reflect the developmental progression of hand grasp and includes compensatory patterns seen in children with an absent or poorly functioning thumb who as infants use palmar grips without use of the thumb. As motor control develops, objects are held at the fingers beginning with ulnar sided scissoring and later, radial scissoring. Normal hand skills develop similarly from the palm out to the fingers and from the ulnar side of the hand to the radial side. Thumb opposition begins with a full hand grasp followed by increased radial isolation with lateral pinch to the side of the index. This is followed by thumb to index tip pinch and for objects requiring manipulation and precision, radial digital opposition. T-GAP scoring reflects this hand development hierarchy with patterns which do not include the thumb receiving fewer points. Grasp and pinch patterns that engage the thumb distally and radially score the most points.

## T-GAP Nomenclature and Scoring Hierarchy

Grasp/Pinch Type	Point Value
<b>No Use of Thumb</b>	
<b>No Grasp or Pinch:</b> passive stabilization with hand	<b>0</b>
<b>Palmar Grasp:</b> fingers to palm	<b>1</b>
<b>Ulnar Scissor Grasp:</b> between small/ring fingers	<b>2</b>
<b>Radial Scissor Grasp:</b> between index/long or long/ring fingers	<b>3</b>
<b>Use of Thumb</b>	
<b>Cylindrical Grasp:</b> opposed thumb to all fingers	<b>4</b>
<b>Lateral Key Pinch:</b> thumb to index	<b>5</b>
<b>Tip Pinch:</b> thumb to index finger tip	<b>6</b>
<b>Tripod Pinch:</b> thumb to distal index/long	<b>7</b>

### Nomenclature and Scoring Descriptions:

- **No Grasp:** Passive stabilization of any part of the hand (**0 points**)
- **Palmar Grasp:** All fingers flexed to palm, no thumb use (**1 point**)
- **Ulnar Scissor Grasp:** Finger stabilization between the small/ring fingers. Also, when 4 web spaces are present (5 fingered hand), stabilization between the ring/long fingers (**2 points**)
- **Radial Scissor Grasp:** Finger stabilization between the index/long or long/ring fingers (**3 points**)
- **Cylindrical Grasp:** Large grasp of all fingers to opposed thumb (**4 points**)
- **Lateral Key Pinch:** Thumb is opposed to the lateral aspect of the index finger; or the index finger opposed to the side of the thumb (i.e. Index Pollicization) (**5points**)
- **Tip pinch:** Thumb is opposed to the tip of the index finger in a static, non-manipulative grasp (**6 points**)
- **Tripod pinch:** Thumb is opposed to the index and long fingers in a manipulative dynamic grasp (**7 points**)

Photo examples of each grasp style and grasp variations can be found in the grasp pattern hierarchy. This two page photo example guide should be printed in color with the pages placed back to back in a clear plastic sleeve and used during scoring. Grasp patterns that exclude the thumb (0-3 points) are shown on the first page while patterns that do include the thumb (4-7 points) the second. The most frequently observed patterns include two picture examples on the left side of the page. Infrequent “variation patterns” where objects may be held more distal or proximal than the primary grasp style, are shown on the right side. Variation patterns with similar level of hand skill, which do not alter the score, include: distal flexion of the fingers, scissors multiple fingers, scissors fingers distally and lateral encircling. Three variation patterns, which require a higher or lower level of hand skill are given a point score adjustment and include: distal cylindrical, tip to non index and proximal radial grasp.

## T-GAP Activities and Administration

It is known that size and features of an object help determine the type of grasp pattern required in which the T-GAP activities are designed to elicit a variety of specific grasp and pinch styles including; large grasp, medium grasp, small grasp, lateral pinch, tip pinch, manipulation, resistance, school and ADLs. Objects and tasks were carefully selected which are safe, maintain a child's interest and are appropriately sized for a toddlers hand to young adults.

There are 3 different sets of administration and test kit item forms for children ages 18 month to 4 years, 5-7 years and 8-18 years. These are the primary forms used when administering the assessment and include guidelines for each activity. These forms should be printed in color and the two pages for each age group should be placed back to back in three separate plastic sleeves. All items are pictured to assist in purchasing similar sized objects when making your own test kit. Written test kit measurements and supplies are listed in pages 9-10 along with amazon examples. The full list of all T-GAP tasks by age, quality and portion of task scored can be found in the last page of this manual.

The specific component rated for each activity is identified in italics in both the administration pages and the score forms. Defining a specific aspect of each task lessens the variety of grasp styles employed throughout the task and improves scoring consistency amongst raters. For example, the ADL task, put sock on foot over toes, the grasp style rated is defined by the method used when holding the sock open to place over the toes. In the case of two grasp styles used equally during the specific aspect of the task, the higher score is awarded. The T-GAP has a theoretical range of 0 - 63 with a higher score indicating a higher thumb opposition skill level. Total score is calculated as the sum of all 9 tasks which is the point values used when calculating and comparing scores for both standardization papers. In addition to the T-GAP total score, the number of different grasp styles used are recorded (points 0 through 7). A normal dexterous hand would use a variety of grasp styles that incorporate the thumb in opposition patterns depending on the type of objects handled..

### Thumb Use Percentage Conversion

Completion	Percentage	Completion	Percentage
1 task of 9	11%	6 tasks of 9	67%
2 tasks of 9	22%	7 tasks of 9	78%
3 tasks of 9	33%	8 tasks of 9	89%
4 tasks of 9	44%	9 tasks of 9	100%
5 tasks of 9	56%		

The number of tasks involving the thumb (points 4 through 7) is recorded to determine the percentage of thumb use. The normal dexterous hand would involve the thumb in all nine T-GAP activities. Scores with smaller percentages of thumb use would indicate more immature, less efficient grasp and pinch function.

## **Validation**

Validation of the T-GAP was originated by a team of Hand Surgeons and Occupational Therapists following IRB approval for a retrospective study of children who underwent index finger pollicization that completed a thumb function assessment between 2005–2014. Validity testing for construct and concurrent validity of the T-GAP was completed and published in the Journal of Hand Surgery in 2018 . This study found significant correlations between the children’s T-GAP score and standardized dexterity measures including the nine hole peg test, the box and blocks test and the functional dexterity test, supporting concurrent validity. In addition, significant correlation was found between strength and range of motion of the thumb and the T-GAP score with P values for each < .05 supporting construct validity. To complete standardization of the T-GAP, a second study was conducted for inter rater and intra rater reliability and published in the Journal of Hand Surgery in 2018. A team of four Occupational Therapists scored 11 videotaped T-GAP assessments twice separated by at least two weeks. Interclass correlation coefficients (ICCs) for the inter-rater reliability trials were 0.887 and 0.901, which suggest raters can classify and score children’s hand function consistently. Intra-rater ICCs in all cases were above 0.88 which is considered excellent. These results strongly suggest that results from T-GAP assessments are reliable.

In 2023, additional validation studies were completed in Northern Europe in children following thumb reconstruction by Ida Neergard Sletten et al. Their study concluded the T-GAP score had a moderate to strong construct validity and a moderate concurrent validity. Both inter- and intrarater reliability was strong.

## **T-GAP Training**

Training prior to clinical application of the T-GAP should include a review of all materials in this manual (Part 1) as well as photo (Part 2) and video (Part 3) training examples. This will best serve to assist the learner in rating grasp style differences and variation patterns. When conducting inter and intra rater testing in our facility, we included a 90 minute discussion period among the clinical team to review the T-GAP manual, administration forms and the scoring hierarchy. Training included reviewing and scoring Part 2 photo and Part 3 video training examples. We recommend reviewing all materials to optimize accuracy with administration and scoring prior to use of the T-GAP with patients. Many of the object handling routines will require multiple video reviews as well as close scrutiny of the scoring guidelines to arrive at the best classification score. Experienced raters will find they can easily score a child directly without the need for video recording.

## Video Recording (Optional Assessment Technique)

When learning the T-GAP, we recommend use of a tablet, hand held camera or smart phone for video recording. This allows you to be mobile, particularly when filming both hands. Recording is best from over the child's head or opposite shoulder to obtain the child's point of view of their hands when manipulating objects. A close-up frontal /overhead view of the hands is another option. If you have a second person doing the recording, their primary role is to ensure a good view that captures activity of the fingers and thumb. If you do not have assistance, we recommend use of a tripod, raised to its tallest setting and positioned over the child's opposite shoulder.

Record each of the tasks in the same order as the administration and test kit pages to make subsequent scoring easier and to ensure each of the nine activities are included. Pay attention to the part of the task being scored (italicized on the score form) to ensure the involved hand is being used. This may involve switching to the non-dominant hand for some tasks. Once you see the action performed, at least twice, move to the next item. Don't allow too much time for the child to explore the toy beyond what's requested. Most young children do fine with this structure and welcome the next activity.

Testing materials should be readily available and out of view from distracting the child's attention. The length of the recording should be 5 - 10 minutes. When using the T-GAP for research purposes, begin the recording by having the child hold up a piece of paper that includes name, date, age, pre-op, or length of time post-op. These details are useful to aide in future treatment planning particularly when videos are stored in the child's medical record.

The child should be seated in a chair with their hips and knees flexed to 90 degrees and feet supported on the floor. For children ages three and younger consider a trip trap chair which is made for smaller children and improves their ability to use their arms and hands when seated at a table. Position an adjustable table or working surface slightly above the elbow when their arm is at their side or belly button level to allow the best view of their arms and hands. If a child is wearing a long sleeved shirt, roll their sleeves up past their elbows.

Try to score the video soon afterwards to ensure you have captured the grasp patterns for each task on the video. Past studies have shown, the thumb is difficult to capture because of its size and sometimes downward position. Scoring and viewing these tapes will help you develop expertise and improve your video recording skills. In addition, this will help you improve your evaluation of grasp and pinch styles and identifying areas of concern. This will help in decision making when recommending treatment including orthotics, therapeutic home exercise programs and surgery. Again, experienced T-GAP raters who have successfully administered the assessment will find they may no longer need video recording.

## Assembling the T-GAP Test Kit

Standardized sized equipment to promote a variety of grasp styles is necessary for valid evaluation. This test was developed to incorporate common tasks, thus all test items can be purchased to specifications as listed and can be found in the pictured administration pages. Some countries have had difficulties finding specific name brand test kit items in which the size and quality of the items should be matched as closely as possible to those pictured and described. We recommend storing the test kits in three medium sized drawstring bags and placing the kits in a backpack labeled T-GAP. The following page of test kit supplies should be laminated into three cards and attached to each of the test kits to keep the items accessible and organized.

Ages 18 Months - 4 Years	Ages 5-7 Years	Ages 8-18 Years
Film container and Cheerios Zippered pencil pouch Two large diameter markers Five blocks (like Duplos) stacked together 4-oz. bottle of bubbles Play Doh or similar moldable clay Drawstring fabric bag Box of eight crayons, standard size One child size sock	Piggy bank and pennies Padlock and key Two small diameter colored markers Medium sized kaleidoscope Peanut butter jar Play Doh Sling shot Drawing pad and a crayon Child sized lace up shoe	Plastic beads and a zip tie Padlock and key Ball point pen Drawing pad and a rubber band Peanut butter jar Pencil sharpener and unsharpened pencil Sling shot Drawing paper and a sharpened pencil Child size lace up shoe

## T-GAP Test Kit Supply List and Specifications

Below are test kit items that meet the measurement and style parameters as shown in the test kit administration pages. An Amazon purchasing example is referenced for each item for your convenience.

### Backpack (to hold all test kit items):

[https://www.amazon.com/gp/product/B07QMTDCK7/ref=ppx\\_yo\\_dt\\_b\\_asin\\_title\\_o00\\_s01?ie=UTF8&psc=1](https://www.amazon.com/gp/product/B07QMTDCK7/ref=ppx_yo_dt_b_asin_title_o00_s01?ie=UTF8&psc=1)

### Iron on T-GAP letters to apply to the backpack:

[https://www.amazon.com/dp/B076CPQSGM?ref=ppx\\_yo2ov\\_dt\\_b\\_product\\_details&th=1](https://www.amazon.com/dp/B076CPQSGM?ref=ppx_yo2ov_dt_b_product_details&th=1)

### Three drawstring bags (to separate and store each age group):

[https://www.amazon.com/gp/product/B07P93FT9J/ref=ox\\_sc\\_act\\_title\\_1?smid=A33A1CZHNI1ZDL&psc=1](https://www.amazon.com/gp/product/B07P93FT9J/ref=ox_sc_act_title_1?smid=A33A1CZHNI1ZDL&psc=1)

### Ages 18 months - 4 years (test kit)

Three Cheerios and a film container:

[https://www.amazon.com/gp/product/B07YYYF7C6/ref=ppx\\_yo\\_dt\\_b\\_asin\\_title\\_o01\\_s00?ie=UTF8&psc=1](https://www.amazon.com/gp/product/B07YYYF7C6/ref=ppx_yo_dt_b_asin_title_o01_s00?ie=UTF8&psc=1) ;

[https://www.amazon.com/gp/product/B09KBGGB9R/ref=ppx\\_yo\\_dt\\_b\\_asin\\_title\\_o00\\_s01?ie=UTF8&psc=1](https://www.amazon.com/gp/product/B09KBGGB9R/ref=ppx_yo_dt_b_asin_title_o00_s01?ie=UTF8&psc=1)

Metal tab (1' x 3/8") zippered pencil pouch (8 1/2" x 4"):

[https://www.amazon.com/gp/product/B08FR1RVSN/ref=ppx\\_yo\\_dt\\_b\\_asin\\_title\\_o01\\_s00?ie=UTF8&psc=1](https://www.amazon.com/gp/product/B08FR1RVSN/ref=ppx_yo_dt_b_asin_title_o01_s00?ie=UTF8&psc=1)

Two large diameter markers (1/2" wide):

[https://www.amazon.com/gp/product/B0141M665A/ref=ppx\\_yo\\_dt\\_b\\_asin\\_title\\_o00\\_s01?ie=UTF8&psc=1](https://www.amazon.com/gp/product/B0141M665A/ref=ppx_yo_dt_b_asin_title_o00_s01?ie=UTF8&psc=1)

Five blocks (like Duplos) stacked together:

[https://www.amazon.com/gp/product/B07QD1FBZC/ref=ppx\\_yo\\_dt\\_b\\_asin\\_title\\_o00\\_s01?ie=UTF8&psc=1](https://www.amazon.com/gp/product/B07QD1FBZC/ref=ppx_yo_dt_b_asin_title_o00_s01?ie=UTF8&psc=1)

4-oz. bottle of bubbles (4 1/4" tall x 1 3/4" wide):

[https://www.amazon.com/gp/product/B071KD7WKP/ref=ppx\\_yo\\_dt\\_b\\_asin\\_title\\_o00\\_s01?ie=UTF8&psc=1](https://www.amazon.com/gp/product/B071KD7WKP/ref=ppx_yo_dt_b_asin_title_o00_s01?ie=UTF8&psc=1)

Play Doh or similar moldable clay (full sized container):

[https://www.amazon.com/gp/product/B07BC1NR52/ref=ppx\\_yo\\_dt\\_b\\_asin\\_title\\_o00\\_s01?ie=UTF8&psc=1](https://www.amazon.com/gp/product/B07BC1NR52/ref=ppx_yo_dt_b_asin_title_o00_s01?ie=UTF8&psc=1)

Drawstring fabric bag (approximately 8" x 6") with 3/8" inch wide string:

[https://www.amazon.com/gp/product/B09BTQDKW8/ref=ox\\_sc\\_act\\_title\\_2?smid=A3PGXP1G3A839&psc=1](https://www.amazon.com/gp/product/B09BTQDKW8/ref=ox_sc_act_title_2?smid=A3PGXP1G3A839&psc=1)

1Box of eight crayons, standard size:

[https://www.amazon.com/gp/product/B0141M665A/ref=ppx\\_yo\\_dt\\_b\\_asin\\_title\\_o00\\_s01?ie=UTF8&psc=1](https://www.amazon.com/gp/product/B0141M665A/ref=ppx_yo_dt_b_asin_title_o00_s01?ie=UTF8&psc=1)

One child size sock:

[https://www.amazon.com/gp/product/B07CN3YXNS/ref=ox\\_sc\\_act\\_title\\_1?smid=A3VM0GA6VR5H1T&psc=1](https://www.amazon.com/gp/product/B07CN3YXNS/ref=ox_sc_act_title_1?smid=A3VM0GA6VR5H1T&psc=1)

### Ages 5-7 years (test kit)

Three pennies and a sturdy medium size plastic piggy bank (4" x 6"):

[https://www.amazon.com/gp/product/B0B4P4WPY9/ref=ppx\\_od\\_dt\\_b\\_asin\\_title\\_s00?ie=UTF8&psc=1](https://www.amazon.com/gp/product/B0B4P4WPY9/ref=ppx_od_dt_b_asin_title_s00?ie=UTF8&psc=1)

Padlock and a sturdy vinyl coated key (padlock 2 3/8" tall x 1 3/4" without the key):

[https://www.amazon.com/gp/product/B00004Y8C7/ref=ppx\\_od\\_dt\\_b\\_asin\\_title\\_s01?ie=UTF8&psc=1](https://www.amazon.com/gp/product/B00004Y8C7/ref=ppx_od_dt_b_asin_title_s01?ie=UTF8&psc=1)

Two small diameter colored markers (3/8-inch wide):

[https://www.amazon.com/gp/product/B000K9DKIA/ref=ppx\\_yo\\_dt\\_b\\_asin\\_title\\_o00\\_s01?ie=UTF8&psc=1](https://www.amazon.com/gp/product/B000K9DKIA/ref=ppx_yo_dt_b_asin_title_o00_s01?ie=UTF8&psc=1)

Medium sized kaleidoscope (9" long x 2 1/2" wide):

[https://www.amazon.com/gp/product/B0B15L36V9/ref=ppx\\_od\\_dt\\_b\\_asin\\_title\\_s01?ie=UTF8&psc=1](https://www.amazon.com/gp/product/B0B15L36V9/ref=ppx_od_dt_b_asin_title_s01?ie=UTF8&psc=1)

1 pound filled peanut butter jar (5" tall by 3" wide); keep the aluminum top seal in place:

[https://www.amazon.com/gp/product/B004FO4ZCQ/ref=ppx\\_yo\\_dt\\_b\\_asin\\_title\\_o00\\_s00?ie=UTF8&psc=1](https://www.amazon.com/gp/product/B004FO4ZCQ/ref=ppx_yo_dt_b_asin_title_o00_s00?ie=UTF8&psc=1)

Play Doh or similar moldable clay (full sized container):

[https://www.amazon.com/gp/product/B07BC1NR52/ref=ppx\\_yo\\_dt\\_b\\_asin\\_title\\_o00\\_s01?ie=UTF8&psc=1](https://www.amazon.com/gp/product/B07BC1NR52/ref=ppx_yo_dt_b_asin_title_o00_s01?ie=UTF8&psc=1)

Sling shot with foam pull (pull size is 2" long and 1 1/4" wide): see photo for bulb style pull at:

[https://www.amazon.com/gp/product/B075DNFH2N/ref=ewc\\_pr\\_img\\_1?smid=A1MH5FCF3E4KXR&th=1](https://www.amazon.com/gp/product/B075DNFH2N/ref=ewc_pr_img_1?smid=A1MH5FCF3E4KXR&th=1)

6" x 9" white drawing pad and a crayon:

[https://www.amazon.com/gp/product/B01AW5V7PE/ref=ox\\_sc\\_act\\_title\\_1?smid=A2L77EE7U53NWQ&psc=1](https://www.amazon.com/gp/product/B01AW5V7PE/ref=ox_sc_act_title_1?smid=A2L77EE7U53NWQ&psc=1)

Child sized lace up shoe with long flat laces:

[https://www.amazon.com/gp/product/B08KXXFCMR/ref=ppx\\_yo\\_dt\\_b\\_asin\\_title\\_o00\\_s01?ie=UTF8&psc=1](https://www.amazon.com/gp/product/B08KXXFCMR/ref=ppx_yo_dt_b_asin_title_o00_s01?ie=UTF8&psc=1)

## **Ages 8-18 years (test kit)**

Five small plastic beads and a 6-inch zip tie:

[https://www.amazon.com/gp/product/B08HMNN2MQ/ref=ox\\_sc\\_act\\_title\\_1?smid=A12BLLJMG182JF&psc=1](https://www.amazon.com/gp/product/B08HMNN2MQ/ref=ox_sc_act_title_1?smid=A12BLLJMG182JF&psc=1)

[https://www.amazon.com/gp/product/B09C1YL7RQ/ref=ppx\\_yo\\_dt\\_b\\_asin\\_title\\_o01\\_s00?ie=UTF8&psc=1](https://www.amazon.com/gp/product/B09C1YL7RQ/ref=ppx_yo_dt_b_asin_title_o01_s00?ie=UTF8&psc=1)

Padlock and a sturdy vinyl coated key (padlock 2 3/8" tall x 1 3/4" without the key):

[https://www.amazon.com/gp/product/B00004Y8C7/ref=ppx\\_yo\\_dt\\_b\\_asin\\_title\\_o00\\_s01?ie=UTF8&psc=1](https://www.amazon.com/gp/product/B00004Y8C7/ref=ppx_yo_dt_b_asin_title_o00_s01?ie=UTF8&psc=1)

Ball point pen with a pull-off cap:

[https://www.amazon.com/gp/product/B0012YVR1O/ref=ppx\\_yo\\_dt\\_b\\_asin\\_title\\_o00\\_s01?ie=UTF8&psc=1](https://www.amazon.com/gp/product/B0012YVR1O/ref=ppx_yo_dt_b_asin_title_o00_s01?ie=UTF8&psc=1)

6" x 9" white drawing pad and a rubber band

[https://www.amazon.com/gp/product/B08TMBFZ9D/ref=ppx\\_yo\\_dt\\_b\\_asin\\_title\\_o00\\_s00?ie=UTF8&psc=1](https://www.amazon.com/gp/product/B08TMBFZ9D/ref=ppx_yo_dt_b_asin_title_o00_s00?ie=UTF8&psc=1)

[https://www.amazon.com/gp/product/B0017D5X9C/ref=ppx\\_yo\\_dt\\_b\\_asin\\_title\\_o00\\_s01?ie=UTF8&psc=1](https://www.amazon.com/gp/product/B0017D5X9C/ref=ppx_yo_dt_b_asin_title_o00_s01?ie=UTF8&psc=1)

1 pound filled peanut butter jar (5" tall by 3" wide); keep the aluminum top seal in place:

*(Duplicate item ages 5-7)*

[https://www.amazon.com/gp/product/B004FO4ZCQ/ref=ppx\\_yo\\_dt\\_b\\_asin\\_title\\_o00\\_s00?ie=UTF8&psc=1](https://www.amazon.com/gp/product/B004FO4ZCQ/ref=ppx_yo_dt_b_asin_title_o00_s00?ie=UTF8&psc=1)

Handheld pencil sharpener and a no. 2 unsharpened pencil:

[https://www.amazon.com/gp/product/B088BWYFMX/ref=ox\\_sc\\_act\\_title\\_1?smid=A8F77PLGS9BW7&psc=1](https://www.amazon.com/gp/product/B088BWYFMX/ref=ox_sc_act_title_1?smid=A8F77PLGS9BW7&psc=1)

[https://www.amazon.com/gp/product/B097F9PYL4/ref=ox\\_sc\\_act\\_title\\_1?smid=A36YNX57F882Q9&psc=1](https://www.amazon.com/gp/product/B097F9PYL4/ref=ox_sc_act_title_1?smid=A36YNX57F882Q9&psc=1)

Sling shot with foam pull (pull size is 2" long and 1 1/4" wide); see photo for bulb style pull

*(Duplicate item ages 5-7)*

[https://www.amazon.com/gp/product/B075DNFH2N/ref=ewc\\_pr\\_img\\_1?smid=A1MH5FCF3E4KXR&th=1](https://www.amazon.com/gp/product/B075DNFH2N/ref=ewc_pr_img_1?smid=A1MH5FCF3E4KXR&th=1)

6" x 9" piece of drawing paper and a no. 2 sharpened pencil:

*(Duplicate drawing pad ages 5-7):*

[https://www.amazon.com/gp/product/B01AW5V7PE/ref=ox\\_sc\\_act\\_title\\_1?smid=A2L77EE7U53NWQ&psc=1](https://www.amazon.com/gp/product/B01AW5V7PE/ref=ox_sc_act_title_1?smid=A2L77EE7U53NWQ&psc=1)

[https://www.amazon.com/gp/product/B006CSPZK4/ref=ox\\_sc\\_act\\_title\\_1?smid=ATVPDKIKX0DER&psc=1](https://www.amazon.com/gp/product/B006CSPZK4/ref=ox_sc_act_title_1?smid=ATVPDKIKX0DER&psc=1)

Child sized lace up shoe with long flat laces

*(Duplicate shoe ages 5-7)*

[https://www.amazon.com/gp/product/B08KXXFCMR/ref=ppx\\_yo\\_dt\\_b\\_asin\\_title\\_o00\\_s01?ie=UTF8&psc=1](https://www.amazon.com/gp/product/B08KXXFCMR/ref=ppx_yo_dt_b_asin_title_o00_s01?ie=UTF8&psc=1)

Play Doh or similar moldable clay (full sized container):

[https://www.amazon.com/gp/product/B07BC1NR52/ref=ppx\\_yo\\_dt\\_b\\_asin\\_title\\_o00\\_s01?ie=UTF8&psc=1](https://www.amazon.com/gp/product/B07BC1NR52/ref=ppx_yo_dt_b_asin_title_o00_s01?ie=UTF8&psc=1)

Sling shot with foam pull (pull size is 2" long and 1 1/4" wide): see photo for bulb style pull at:

[https://www.amazon.com/gp/product/B075DNFH2N/ref=ewc\\_pr\\_img\\_1?smid=A1MH5FCF3E4KXR&th=1](https://www.amazon.com/gp/product/B075DNFH2N/ref=ewc_pr_img_1?smid=A1MH5FCF3E4KXR&th=1)

6" x 9" white drawing pad and a crayon:

[https://www.amazon.com/gp/product/B01AW5V7PE/ref=ox\\_sc\\_act\\_title\\_1?smid=A2L77EE7U53NWQ&psc=1](https://www.amazon.com/gp/product/B01AW5V7PE/ref=ox_sc_act_title_1?smid=A2L77EE7U53NWQ&psc=1)

Child sized lace up shoe with long flat laces:

[https://www.amazon.com/gp/product/B08KXXFCMR/ref=ppx\\_yo\\_dt\\_b\\_asin\\_title\\_o00\\_s01?ie=UTF8&psc=1](https://www.amazon.com/gp/product/B08KXXFCMR/ref=ppx_yo_dt_b_asin_title_o00_s01?ie=UTF8&psc=1)

## Thumb Grasp and Pinch Assessment (T-GAP) by Age, Task, Quality and Portion of Task Scored

	T-GAP Activity Ages 18 months – 4 years	T-GAP Activity Ages 5 – 7 years	T-GAP Activity Ages 8 – 18 years
<b>Tip Pinch</b>	Pick up 3 Cheerios one at a time and release into a film container <i>Score how the Cheerio is held</i>	Pick up 3 pennies one at a time and release into a piggy bank <i>Score how the penny is held</i>	Thread 5 plastic beads onto a zip tie  <i>Score how the bead is held</i>
<b>Lateral Key Pinch</b>	Open a zippered pencil case and remove 2 markers <i>Score how the zipper tab is held</i>	Turn a vinyl coated key to open a Padlock <i>Score how the key is held</i>	Turn a vinyl coated key to open a Padlock <i>Score how the key is held</i>
<b>Small Grasp</b>	Pull cap off a large diameter marker <i>Score how the marker is held</i>	Pull cap off a small diameter marker <i>Score how the marker is held</i>	Remove cap from ballpoint pen <i>Score how the pen is held</i>
<b>Medium Grasp</b>	Separate 5 Duplo style blocks that are stacked together <i>Score how the duplos are stabilized</i>	Turn end of kaleidoscope 3 times <i>Score how the kaleidoscope is held</i>	Make a telescope with a 6" x 9" sheet of paper and place rubber band over <i>Score how the paper tube is held</i>
<b>Large Grasp</b>	Open a 4 oz. container of bubbles <i>Score how the container is stabilized</i>	Twist cap from a 1# peanut butter jar <i>Score how the jar is held</i>	Twist cap off from a 1# peanut butter jar <i>Score how the jar is held</i>
<b>Manipulation</b>	Form moldable clay into a bowl <i>Score how the moldable clay is held</i>	Form moldable clay into a bowl <i>Score how the moldable clay is held</i>	Rotate a pencil 3 times in a handheld pencil sharpener <i>Score how the pencil is held</i>
<b>Resistance</b>	Open a drawstring bag <i>Score how the bag is held when opened</i>	Pull back foam pull on slingshot <i>Score how the foam pull is held</i>	Pull back foam pull on slingshot <i>Score how the foam pull is held</i>
<b>School</b>	Open a box of 8 crayons and remove one <i>Score how the crayon is held</i>	Color inside a circle with a crayon <i>Score how the crayon is held</i>	Write name with a no. 2 pencil <i>Score how pencil is held</i>
<b>ADL</b>	Put sock on over toes <i>Score how the sock is held open</i>	Tie shoelaces into a knot <i>Score how the laces are held</i>	Tie shoelaces into a bow <i>Score how the laces are held</i>

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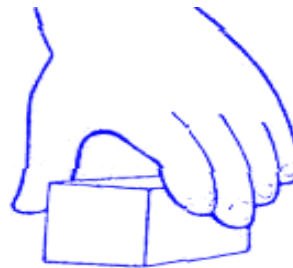
## Part 1

### T-GAP Background, Administration and Training



### *Agenda*

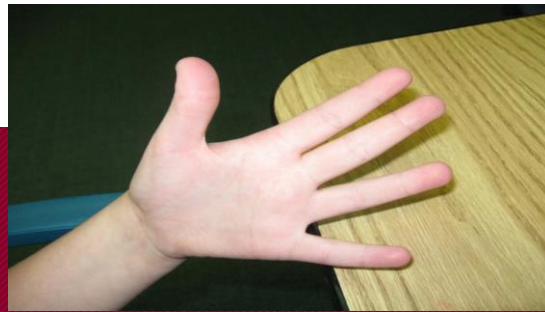
- Background
- Assessment of Thumb Hypoplasia
- T-GAP Standardization
- Administration
- Scoring



## ***Background: Normal thumb***

Congenital deficiency of the thumb greatly compromises hand function because the normal thumb contributes at least 40% of its usefulness. Vekris, Beris, Lykissas, Soucacos. Index finger pollicization in the treatment of the congenitally deficient thumb. *Ann Plast Surg. 2011*

The thumb is a specialized organ with unique functions that cannot be replicated by any other digit. Taghinia, Littler, Upton. Refinements in pollicization: a 30-year experience. *Plast Reconstr Surg 2012*



## ***Background: Typically developing thumb***

- Unique position of opposition at rest
- Saddle joint allows wide range of movement and rotation



## ***Background: Major developmental defects of the thumb***

- Constitute 16% of all birth deformities of the hand
- Frequently associated with partial or complete absence of the radius
- May present in isolation or as a component of a syndrome
- Bilateral involvement (62%)
- Absent or unstable thumb requires flexing or scissoring the fingers to stabilize an object



***Our research focused on children that had an absent or unstable thumb that underwent index pollicization surgery***

***We wanted to understand how their new “thumb” functioned.***

- Absent or unstable CMC joint require thumb reconstruction
- Taking a mobile index finger to create an opposable thumb



**Literature review:**

**Outcomes to measure thumb function following index pollicization most commonly include strength and range of motion testing**



**Literature review: Outcome tools to measure dexterity**

- Repetitive grasping of pegs or blocks
- Scores based on speed of performance
- Age matched normative data
- Allow any grasp pattern including no thumb use

**9 Hole Peg Test**



**Functional Dexterity Test**



**Box and Blocks Test**



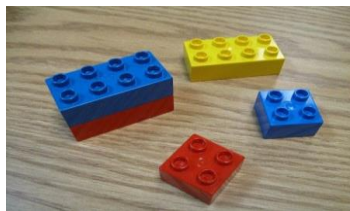
## ***Literature Review: Object Handling Assessments to Measure Thumb Use***

- Several described; none were standardized
- Activities not age appropriate for young children
- All lacked a well-developed scale: Thumb use (Yes/No)
- Abnormal grasp patterns lacked standard terminology
  - Tricks moves
  - Side to side pinch
  - Modified manner



## **T-GAP: Thumb Grasp and Pinch Assessment:**

Developed to rate the hands ability to formulate grasp and pinch when stabilizing objects of different size and feature



## Hand Assessment Protocol Developed in 2005

- All patients with congenitally deficient thumbs were referred to OT for thumb function testing
- Included all standard outcome measures
- Object handling assessment (T-GAP)
- Became our standard of care for establishing baseline skills, progress and determining the effectiveness of surgeries and therapies
- Aided families in understanding their child's thumb function, concerns and progress over time



*We published our hand assessment results for concurrent and construct validity and found the varied grasp styles in these children were not entirely captured by standard outcome measures which are based on speed and allow any pinch pattern to be used including those that exclude the thumb. Functional measurement of the thumb using the T-GAP is an important new variable to measure hand dexterity.*

EDITOR'S CHOICE

### A New, Direct Measure of Thumb Use in Children After Index Pollicization for Congenital Thumb Hypoplasia

Kathleen M. Kollitz, MD,\* Wendy A. Tomhave, BA,† Ann E. Van Heest, MD,†† Steven L. Moran, MD†

**Purpose:** After index pollicization for congenital thumb hypoplasia, time-based hand dexterity tests do not indicate whether the new thumb is being used by a child. The Thumb Grasp and Pinch assessment (T-GAP) is a new outcome measure that classifies grasp and pinch styles to quantify use of the new thumb. The goal of this study was to establish concurrent validity and construct validity in the T-GAP.

**Methods:** Data from children treated with index finger pollicization for congenital thumb hypoplasia were retrospectively reviewed. Measures of strength, range of motion, and scores on the Box and Blocks Test (BBT), 9-Hole Peg Test (NHPT), Functional Dexterity Test (FDT), and Task 7 (Heavy Objects) from the Jebsen-Taylor Test (JTT) were recorded. Patients also completed the T-GAP consisting of 9 age-appropriate tasks, during which grasp patterns were classified. Spearman correlation coefficients were calculated comparing the T-GAP score with scores on the BBT, NHPT, FDT, and JTT.

**Results:** We evaluated 21 thumbs in 21 children an average of 71.7 months after pollicization surgery (range, 9–175 months). The T-GAP score was significantly correlated with BBT, NHPT, FDT, and JTT ( $R = 0.69$ ,  $-0.60$ ,  $-0.59$ , and  $-0.60$ , respectively). The T-GAP score was significantly correlated with tripod pinch, key pinch, and grip strength ( $R = 0.77$ ,  $0.75$ , and  $0.71$ , respectively) and with opposition and grasp span ( $R = 0.50$  and  $0.52$ , respectively). The T-GAP was the only functional measure correlated with parent and patient satisfaction with thumb function.

**Conclusions:** Concurrent validity was supported by significant correlations between T-GAP score for all 4 dexterity measures. Construct validity was supported by significant correlations between strength and range of motion of the thumb and T-GAP score.

**Clinical relevance:** This evaluation may help surgeons and therapists better understand results after pollicization and determine whether the new thumb is being incorporated into daily activities. (*J Hand Surg Am.* 2018;43(11):978–986. Copyright © 2018 by the American Society for Surgery of the Hand. All rights reserved.)

**Key words:** Congenital thumb hypoplasia, dexterity measure, index pollicization, outcomes, thumb use.

Additional Material at [jbs.sagepub.com](http://jbs.sagepub.com)



We completed further validation studies through inter and intrarater reliability testing

Reliability results were excellent in all cases which is a strong indication that results from the T-GAP assessment are reliable

SCIENTIFIC ARTICLE

### Inter- and Intrarater Reliability of the Thumb Grasp and Pinch Assessment for Children Following Index Pollicization for Congenital Thumb Hypoplasia

Wendy A. Tomhave, BA,<sup>1</sup> Kathleen M. Kollitz, MD,<sup>1</sup> Steven L. Moran, MD<sup>1</sup>

**Purpose** The Thumb Grasp and Pinch (T-GAP) assessment quantifies functional hand use in children with congenital thumb hypoplasia by categorizing grasp and thumb use patterns during assessment activities that encourage a variety of grasp and pinch styles. This study aims to demonstrate interrater and intrarater reliability results of the T-GAP.

**Methods** A retrospective review was performed of children who had undergone index finger pollicization for congenital thumb hypoplasia and subsequent evaluation with videotaping of the T-GAP assessment. Following a training period, 4 occupational therapists scored 11 T-GAP videos on 2 separate occasions, separated by at least 2 weeks. Intraclass correlation coefficients (ICCs), standard error of measurements, minimum detectable change (MDC), and Pearson correlation coefficients were calculated.

**Results** The T-GAP raw scores were 16 to 55, demonstrating a range of mild to severe hand grasp differences. The ICCs for the interrater reliability trials were 0.887 and 0.901. Intrarater ICCs were all above 0.88. The MDC for each trial was 8.1 and 6.7 points. Pearson correlation coefficients calculated for each rater and each pair of raters were above 0.8 in all cases.

**Conclusions** Interrater and intrarater reliability testing results for the T-GAP were excellent in all cases; this strongly suggests that results from T-GAP assessments are reliable. The high ICCs suggest that raters can classify and score children's hand function consistently.

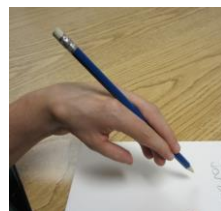
**Clinical relevance** This study, in conjunction with previous work, suggests that the T-GAP may be an ideal approach to assessing the outcomes of pollicization and provide a means of ongoing assessment of children's grip and pinch function. (*J Hand Surg Am.* 2018; ■■■):1.e1-e8. Copyright © 2018 by the American Society for Surgery of the Hand. All rights reserved.)

**Key words** Assessment, dexterity, pollicization, reliability, thumb.



T-GAP Validation Studies concluded that understanding typical and atypical grasp and thumb use patterns can potentially facilitate the choice of strategies:

- in the therapeutic process
- to determine the success of surgical treatment
- to aid in future surgical decision making



*T-GAP Studies accepted for publication in 2023*

**Abductor pollicis longus tendon abnormalities and release in children with congenital clasped thumbs**

Jacqueline Israel, MD  
Mayo Clinic

Steven Moran, MD  
Mayo Clinic

**The thumb grasp and pinch assessment's validity and reliability in children with reconstructed hypoplastic thumbs**

Ida Neergard Sletten, MD PhD  
Oslo University Hospital, Norway

Jarkko Jokihaara, MD PhD  
Tampere University Hospital, Finland



***T-GAP Thumb Grasp and Pinch assessment***

- There was a need for developmentally appropriate activities for young children (Standardized for children as young as 18 months)
- Activities designed for three different age groups
- Object size encourages specific grasp style (i.e. tip pinch)

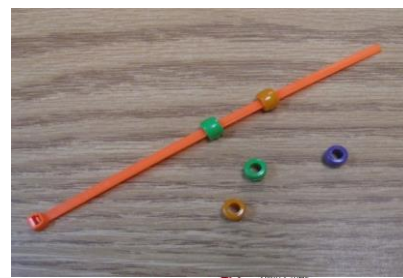
18 months – Age 4



Tip Pinch  
Ages 5 – 7



Ages 8 - 18



## ***T-GAP Thumb Grasp and Pinch Assessment***

- Includes nine activities to facilitate a variety of grasp styles and qualities

tip pinch	manipulation
lateral key pinch	resistance
small grasp	school
medium grasp	activities of daily living
large grasp	



*T-GAP Uses an 8 point Hierarchical Scale*

*Nine tasks are rated from the most primitive grasp styles that exclude the thumb (0-3 points)*

*To more sophisticated patterns that engage the thumb in distal patterns of radial digital opposition (4-7 points)*

### **Grasp and Pinch Style Scoring**

- 0 No Grasp, Passive Stabilization
- 1 Palmar Grasp, Finger Flexion; No Thumb Use
- 2 Ulnar Scissor Grasp; No Thumb Use
- 3 Radial Scissor Grasp; No thumb Use
  
- 4 Cylindrical Grasp; Thumb to Fingers
- 5 Lateral Key Pinch; Thumb to Index
- 6 Tip Pinch; Thumb to Finger Tip
- 7 Tripod Pinch; Thumb to Distal Index/Long



## 5-7 Year Old Activities

- **Tip pinch** – put pennies into a bank
- **Lateral key pinch** – turn key to open padlock
- **Small grasp** – pull cap off marker
- **Medium grasp** – turn the end of a kaleidoscope
- **Large grasp** – open a jar of peanut butter



## 5-7 Year Old Activities

- **Manipulation** – form a bowl out of play dough
- **Resistance** – pull back foam pull on sling shot
- **School** – color inside a circle
- **ADL** – tie shoelaces into a knot



## ***Test Kit Handouts and Training***

- Scoring and administration manual
- T-GAP administration and test kit items (3 age groups)
- T-GAP score forms (3 age groups)
- T-GAP activities chart by age and grasp style (end of admin manual)
- Two page scoring guide
- Validity Papers (2)

### **Grasp Style Example Practice to learn the scoring hierarchy**

- Part 2 Scoring photo examples
- Part 3 Scoring video examples



## ***T-GAP Scoring and Interpretation***

- 5-10 minutes to administer
- 9 activities are video recorded when learning the assessment
- Score during a subsequent viewing
- Final T-GAP score (range of 9-63 points)
- Higher score indicates a higher thumb opposition level



## ***T-GAP Rating***

- 10 minutes to score
- Identifies primary grasp style
- Multiple grasp styles
- Percentage of thumb use
- Monitor progress over time
- Compare pre- and post-operative function



## ***Hierarchical Scoring System Based on Principles of Hand Development for Normal and Abnormal Grasp Styles***

- Grasp patterns develop from flexion to extension and abduction
- Hand development develops from ulnar to radial grasps
- Palmar grips immobilize an object and progress to distal patterns that permit manipulation
- Refinement of intrinsic hand function
- Skillful distal finger control with object translation
- Complex rotation of objects within the hand



### **T-GAP Scoring**

***Designed our scale based on combining normal and abnormal hand development.***

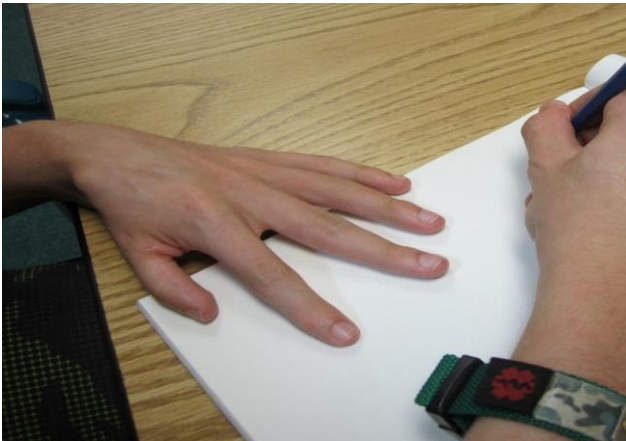
***Early literature evaluating the results of index pollicization described patterns that do not include the thumb but lacked standard nomenclature***

#### **Grasp and Pinch Style Scoring**

- 0 No Grasp, Passive Stabilization
- 1 Palmar Grasp, Finger Flexion; No Thumb Use
- 2 Ulnar Scissor Grasp; No Thumb Use
- 3 Radial Scissor Grasp; No thumb Use
  
- 4 Cylindrical Grasp; Thumb to Fingers
- 5 Lateral Key Pinch; Thumb to Index
- 6 Tip Pinch; Thumb to Finger Tip
- 7 Tripod Pinch; Thumb to Distal Index/Long



***0 Points:  
No Grasp or Pinch  
Passive Stabilization of Hand***



**1 Point:**  
**Palmar Grasp, Finger Flexion; No Thumb Use**  
**All Fingers Flexed to Palm**



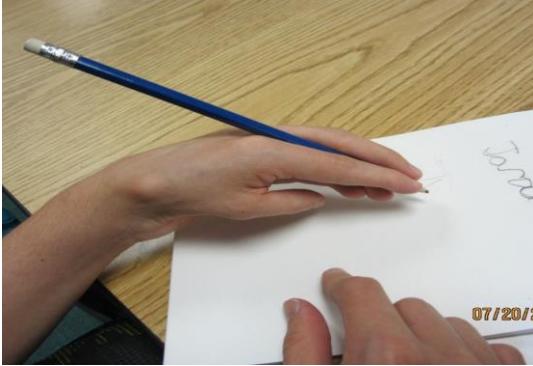
**2 Points:**  
**Ulnar Scissor Grasp; No Thumb Use**  
**Scissors Fingers between the Small/Ring Fingers**  
*(early literature described primitive patterns as deviant grasp and trick moves)*



**3 Points:**

**Radial Scissor Grasp; No Thumb Use**

**Scissors Fingers between the Index/Long or Long/Ring Fingers**



**4 Points:**

**Cylindrical Grasp**

**Proximal Grasp of all Fingers to Opposed Thumb**



**5 Points:**

**Lateral Key Pinch**

**Thumb to Side of Index or Index to Side of Thumb**



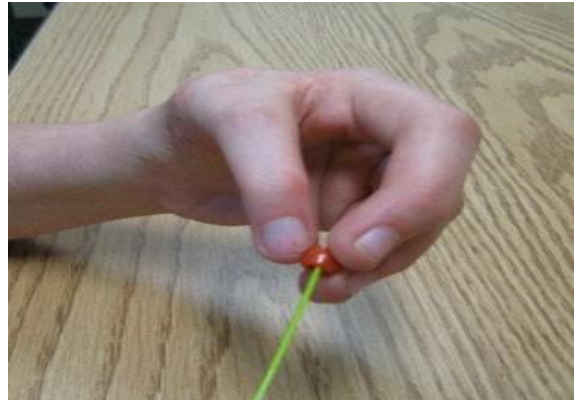
**6 Points:**

**Tip Pinch**

**Opposes Thumb to Side or Tip of Index Finger**



**7 Points:  
Tripod Pinch  
Opposes Thumb to Distal Index/Long Fingers**



**T-GAP Scoring for No Use of Thumb (0–3 points)**

**0 points = No grasp, passive stabilization**  
Passive stabilizing using fingertips or side of hand or task not observed



**1 point = Palmar Grasp, finger flexion**  
Finger flexion; all fingers to palm



**Variation Patterns on Right Side**  
(show alternate grasp patterns for each point value shown on the left)

**Distal flexion of fingers=1 Point**  
Finger flexion without use of palm



**2 points = Ulnar Scissor Grasp**  
Finger stabilization between small/ring. If 4 web spaces present (infrequently occurs), also between ring/long fingers



**Scissors Multiple Fingers**  
Weaves objects and stabilizes between multiple fingers



**3 points = Radial Scissor Grasp**  
Finger stabilization Between the index/long finger or long/ring finger



**Distal Finger Scissoring**  
Distal pinch between non adjacent finger tips



## T-GAP Scoring for Thumb Use (4–7 Points)

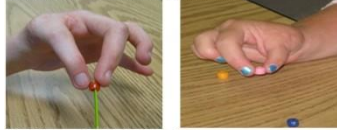
**4 points = Cylindrical Grasp; thumb to all fingers**  
Opposed thumb with proximal grasp of all fingers



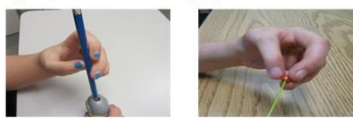
**5 points = Lateral/Key Pinch**  
Opposes thumb to side of index finger



**6 points = Tip Pinch**  
Opposes thumb to side or tip of index finger



**7 Points = Radial Digital Grasp**  
Opposes thumb to index and long fingers



### Variations

**Distal cylindrical - 5 Points**  
Distal grasp of all fingers to opposed thumb



**Lateral Cylinder - 5 Points**  
Encircling grasp of thumb and index finger



**Tip to Non Index finger- 5 Points**  
Opposes thumb to tip of ring, long or small finger



**Proximal Radial Digital Grasp - 6 Points**  
Supports objects proximally thumb/index/long fingers



## Scoring Guidelines

- Score the most frequent pattern observed
- Two patterns equally used, score higher value
- Know what portion of the task you are scoring when you are videotaping
- Use the two-page scoring guide
- Variation pattern examples are shown on the right side of page



There are three different score forms based on age

The Thumb Grasp and Pinch Assessment T-GAP Score form 5 years – 7 years		
T-GAP Activity	LEFT (Score 0-7)	RIGHT (Score 0-7)
Pick up 3 pennies one at a time and release into a piggy bank <b>(tip pinch)</b> <i>Score how penny is held</i>		
Turn a key to open a 1-3/16" Master padlock <b>(lateral key pinch)</b> <i>Score how key is held</i>		
Pull cap off a small diameter Crayola® marker <b>(small grasp)</b> <i>Score how marker is held</i>		
Turn end of kaleidoscope 3 times <b>(medium grasp)</b> <i>Score how kaleidoscope is held</i>		
Twist cap from a 1 lb. peanut butter jar <b>(large grasp)</b> <i>Score how jar is held</i>		
Form Play-Doh® into a bowl <b>(manipulation)</b> <i>Score how Play-Doh is held</i>		
Pull back foam pull on slingshot <b>(resistance)</b> <i>Score how foam pull is held</i>		
Color inside a circle with a crayon <b>(school)</b> <i>Score how crayon is held</i>		
Tip shoelaces into a knot <b>(ADL)</b> <i>Score how laces are held</i>		

<b>Grasp and Pinch Style Scoring</b> 0 No Grasp, Passive Stabilization 1 Palmar Grasp, Finger Flexion; No Thumb Use 2 Ulnar Scissor Grasp; No Thumb Use 3 Radial Scissor Grasp; No Thumb Use 4 Cylindrical Grasp; Thumb to Fingers 5 Lateral Key Pinch; Thumb to Index 6 Tip Pinch; Thumb to Finger Tip 7 Tripod Pinch; Thumb to Distal Index/Long	<b>T-GAP Total Score</b> Left Hand _____/63 Right Hand _____/63 <b>Number of Grasp Styles: Points 1-7</b> Left Hand _____ Right Hand _____ <b>Thumb Usage: Points 4-7</b> Left Hand _____/9 Right Hand _____/9
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## T-GAP test kit items and administration








## Videotaping Tips and Set-up

- Mobile tablet or handheld camera
- Tripod – tallest setting over child’s shoulder or record in front of hands
- Record over child’s head or opposite shoulder to the hand you are evaluating
- Record each task in order as the administration and test kit form
- Have testing materials ready, off to the side
- Don’t allow too much time beyond what’s requested
- May need to switch hands to show tasks twice, using left and right hands







## T-GAP Administration and Test Kit Supplies: Ages 18 Months - 4 Years

	<p><b>Film container and cereal</b> Place the container and three cheerios in front of the child. Ask the child to pick up each cheerio and put it in the container.</p> <p><b>Score:</b> How the cheerio is held</p>
	<p><b>Metal tab zippered pencil pouch and two markers</b> Place two markers in the zippered pencil pouch. Ask the child to unzip the pouch and remove the markers.</p> <p><b>Score:</b> How the zippered tab is held</p>
	<p><b>Large diameter marker</b> Ask the child to remove the cap from the marker then put the cap back on tightly and then remove the cap again.</p> <p><b>Score:</b> How the marker is held</p>
	<p><b>Five duplo style blocks stacked together</b> Ask the child to pull the blocks apart and put them back together again.</p> <p><b>Score:</b> How the blocks are held</p>
	<p><b>4-oz. bottle of bubbles with twist-off lid</b> Ask the child to remove the lid and put the lid back on.</p> <p><b>Score:</b> How the bottle is held</p>








## T-GAP Administration and Test Kit Supplies: Ages 18 Months - 4 Years

	<p><b>Full-size container of Moldable Clay</b> Demonstrate how to form the clay into a bowl and help to start the shape. Ask the child to make a bowl using their hands to shape it.</p> <p><b>Score:</b> How the clay is held</p>
	<p><b>Medium-size fabric drawstring bag with rope laces</b> Put blocks inside the bag and pull the drawstring to close the bag. Demonstrate how to use your hands to fully open the drawstring bag. Close the bag and ask the child to open the bag to see what is inside.</p> <p><b>Score:</b> How the bag is held</p>
	<p><b>Box of 8 crayons</b> Place the box of crayons in front of the child. Ask the child to open the box and pull out his / her favorite color crayon. If you do not observe the grasp pattern, ask the child to pull out his second favorite color crayon.</p> <p><b>Score:</b> How the crayon is held</p>
	<p><b>Child size sock</b> Have the child sit in a chair or on the floor. Ask the child to remove one shoe and put the sock on.</p> <p><b>Score:</b> How the sock is held open</p>



## T-GAP Administration and Test Kit Supplies: Ages 5-7 Years

	<p><b>Sturdy medium size piggy bank and 3 pennies</b> Place the bank and three pennies in front of the child. Ask the child to pick up and put each penny into the piggy bank</p> <p><b>Score:</b> How the penny is held</p>
	<p><b>Padlock (2 3/8" tall) with vinyl-coated key</b> Demonstrate how to insert the key and turn it to open the padlock then demonstrate how to relock the padlock. Ask the child to unlock and lock the padlock two times.</p> <p><b>Score:</b> How the key is held</p>
	<p><b>Small circumference marker (3/8" wide)</b> Place a marker in front of the child. Ask the child to pull off the cap then put the cap on tightly then pull the cap off again.</p> <p><b>Score:</b> How the marker is held</p>
	<p><b>Kaleidoscope (9" long and 2 1/2" wide)</b> Demonstrate how to use the kaleidoscope by holding it horizontally and looking through it while rotating the end. Ask the child to look through the kaleidoscope and turn the end three times.</p> <p><b>Score:</b> How the kaleidoscope is held</p>
	<p><b>1 pound peanut butter jar (3" wide and 5" tall)</b> Place the peanut butter jar in front of the child and ask the child to take the cover off and put the cover back on.</p> <p><b>Score:</b> How the jar is held</p>



## T-GAP Administration and Test Kit Supplies: Ages 5-7 Years



### **Full-size container of moldable clay**

Demonstrate how to form moldable clay into a bowl then form into a ball and place on the table. Ask the child to make a bowl. You can help start the shape if needed.

**Score:** How the clay is held



### **Slingshot with foam pull**

Demonstrate how to hold the slingshot, grasp the round end of the pull and pull back with moderate force then release. Ask the child to do this sequence twice

**Score:** How the foam pull is held



### **6" x 9" white drawing pad and a crayon**

Place a peanut butter jar on the paper and draw a circle around it with the crayon. Ask the child to color in the circle with the crayon.

**Score:** How the crayon is held



### **Child-size lace-up shoe with long, flat laces**

Place the shoe in front of the child and ask the child to tie a knot with the laces. You can show how to make a knot if needed.

**Score:** How the laces are held



## T-GAP Administration and Test Kit Supplies: Ages 8-18 Years



### **Plastic zip tie and 5 plastic beads**

Ask the child to thread the plastic beads onto the zip tie one at a time.

**Score:** How the bead is held



### **Padlock and vinyl-coated key**

Demonstrate how to insert the key and turn it to open the padlock, then relock the padlock. Ask the child to unlock and lock the padlock two times.

**Score:** How the key is held



### **Ballpoint pen with a pull off cap**

Ask the child to pull off the cap and put the cap back on tightly then pull the cap off again.

**Score:** How the pen is held



### **6" x 9" sheet of drawing paper and a rubber band**

Demonstrate and ask the child to make a large tube by rolling up the piece of paper and placing the rubber band around the middle. Ask the child to hold the tube and look through the end.

**Score:** How the paper tube is held



### **Unopened 1-lb. peanut butter jar**

Ask the child to take the cover off and put the cover back on. Leave the metal seal on top of the jar in place.

**Score:** How the jar is held



### T-GAP Administration and Test Kit Supplies: Ages 8-18 Years



**Handheld pencil sharpener and new no. 2 pencil**

Ask child to sharpen the pencil. You must observe at least three rotations of the pencil in the sharpener.

**Score:** How the pencil is held



**Slingshot with foam pull**

Demonstrate how to hold the slingshot upright, grasp the foam pull by the round / bulb end and pull back with moderate force, then release. Ask the child to demonstrate this sequence twice.

**Score:** How the foam pull is held



**6" x 9" drawing pad with a no. 2 sharpened pencil**

Provide the child with an open drawing pad and sharpened no. 2 pencil. Ask the child to write his name on a piece of paper.

**Score:** How the pencil is held



**Child's size lace-up shoe with long, flat laces**

Place the shoe in front of the child and ask the child to tie the shoelaces into a bow. If needed, you can demonstrate how to tie the bow.

**Score:** How the laces are held, not the ability to tie the laces



## Photo Example Scoring Practice

(See Part 2 Training)





# T-GAP Scoring Photo Examples Part 2



*Grasp Style:*  
*Radial scissor grasp: 3 points*



**Grasp Style:**

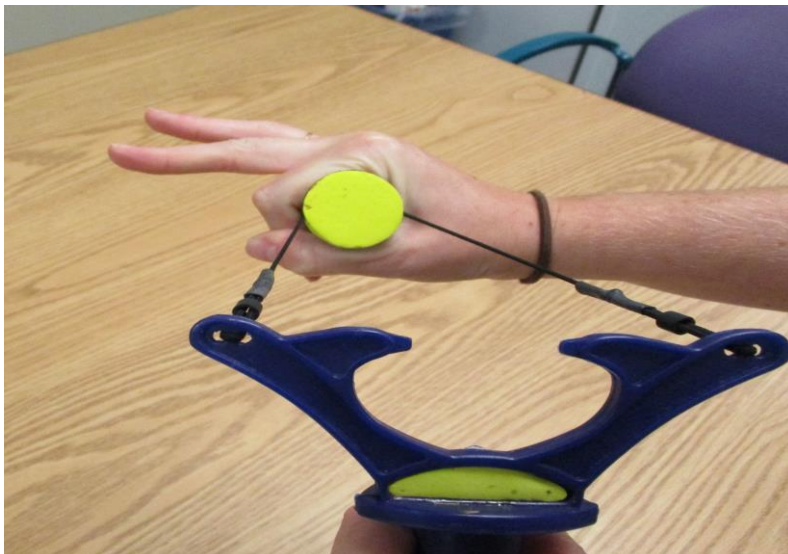
*Variation pattern: Scissors multiple fingers; weaves object between multiple fingers- 2 points*



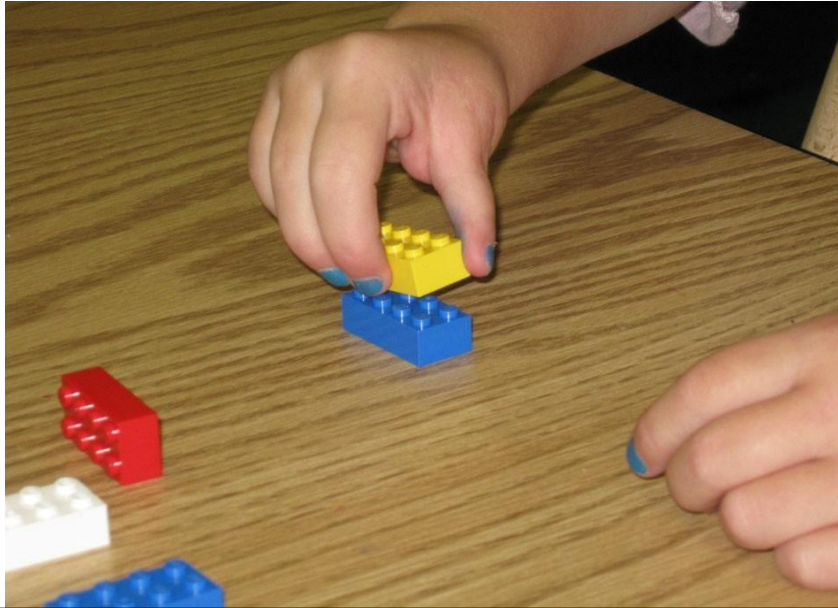
**Grasp Style:**

*Variation pattern: Lateral cylinder*

*Encircling grasp of thumb and index finger –5 points*



*Grasp style:*  
*Radial digital grasp - 7 points*



*Grasp Style:*  
*Variation pattern distal flexion of fingers - 1 point*



**Grasp pattern:**

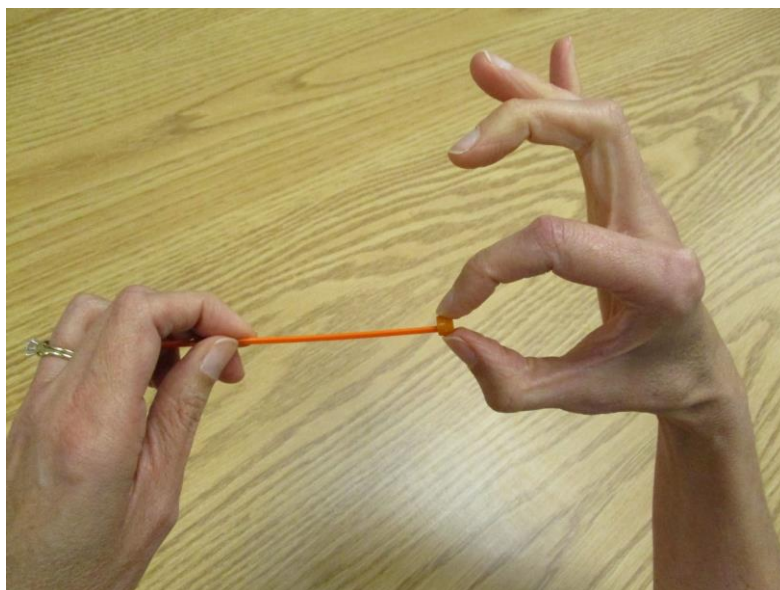
*Lateral/key pinch – 5 points*

*In the case of index pollicization this includes the index to the side of the thumb as shown here*



**Grasp style:**

*Tip pinch - 6 points*



*Tie shoes laces into a knot: ages 5 – 7*

*Score: how the laces are held*

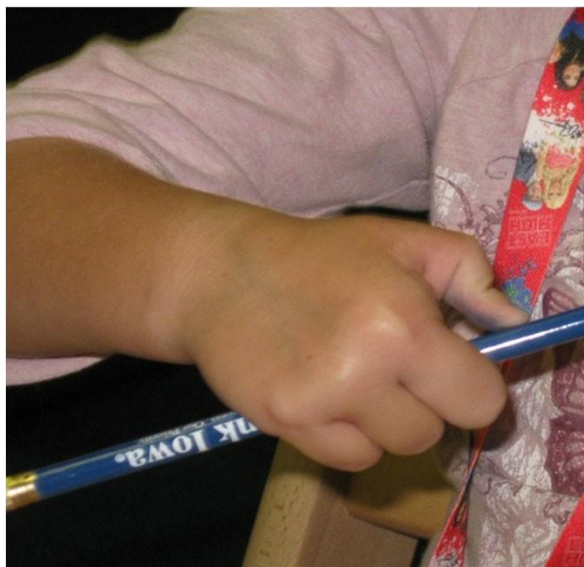
*Correct score: variation pattern – distal flexion of fingers; no thumb use – 1 point*



*Rotate pencil in a hand held pencil sharpener – ages 8 – 18 years*

*Score: how the pencil is held*

*Correct score: Cylindrical grasp; thumb to all fingers – 4 points*



*Write name: ages 8-18 years*

*Score: how the pencil is held*

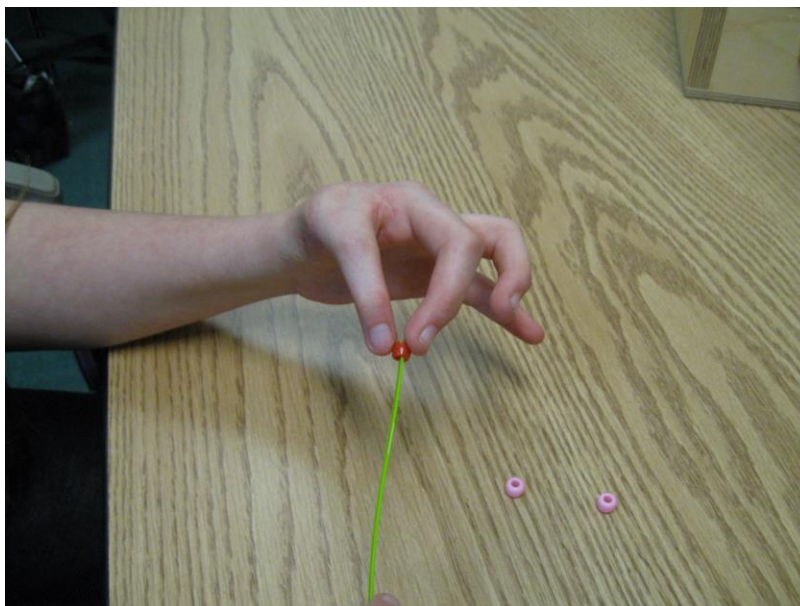
*Correct score: Variation – proximal radial digital grasp – 6 points*



*Thread beads onto a plastic zip tie: ages 8 -18 years*

*Score: how the bead is held*

*Correct score: tip pinch – 6 points*



*Sharpen a pencil in a handheld pencil sharpener*

*Score: how the pencil is held*

*Correct score: radial scissor grasp –3 points*



*Stack 5 duplo style blocks - ages 18 months –4 years*

*Score: how the blocks are held*

*Correct score: both hands variation distal cylindrical; distal grasp of all fingers to opposed thumb –5 points*



*Turn a key in padlock: ages 5-7 years*

*Score: how the key is held*

*Correct score: Lateral / key pinch; opposes thumb to side of index – 5 points*



*Place 5 beads on a plastic zip tie: ages 8-18 years*

*Score: how the bead is held*

*Correct score: tip pinch – 6 points*



*Place 5 beads on a plastic zip tie: ages 8-18 years*

*Score: how the bead is held*

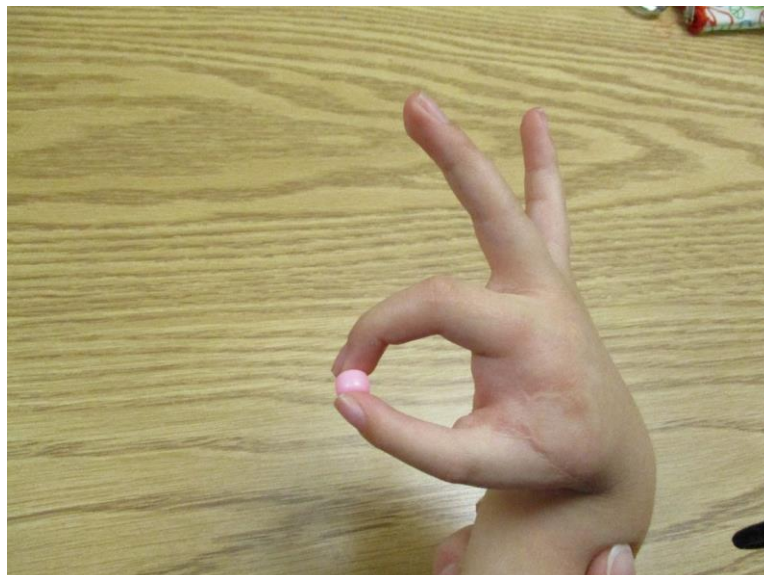
*Correct score: variation – distal finger scissoring, no use of thumb – 3 points*



*Thread beads onto a plastic zip tie*

*Score: how the bead is held*

*Correct score: tip pinch 6 points*



*Turn key to open a padlock: ages 5-7 years*

*Score: how the key is held*

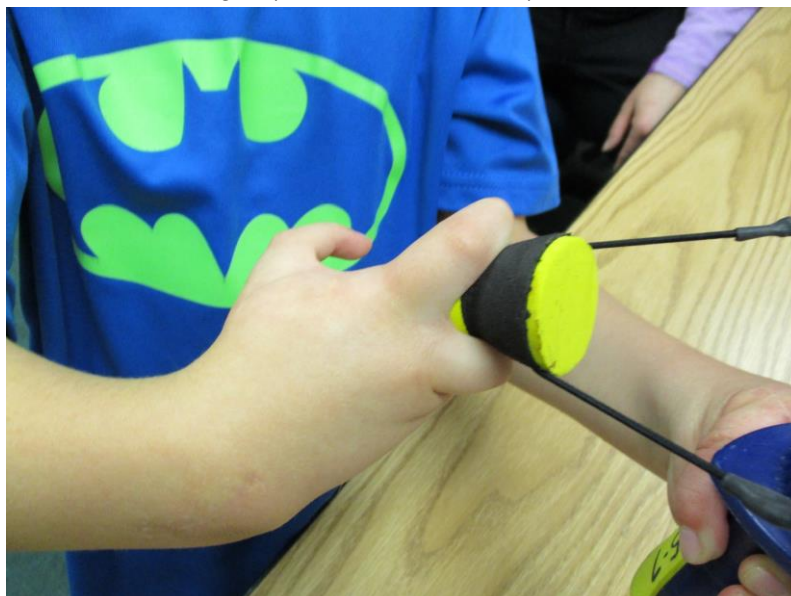
*Correct answer: radial scissor grasp, no thumb use – 3 points*



*Pull foam pull back on sling shot – ages 5-7 years*

*Score: how the foam pull is held*

*Correct score: radial scissor grasp, no thumb use – 3 points*



*Remove cap from ball point pen – ages 8-18 years*

*Score: how the pen is held*

*Correct score: variation – proximal radial digital grasp – 6 points*



*Open zippered pencil case- ages 18 months – 4 years*

*Score: how the zippered pull tab is held*

*Correct score: variation; distal finger flexion, no thumb use – 1 point*



*Pull cap off marker : ages 5-7*

*Score: how the marker is held*

*Correct score: palmar grasp – finger flexion; no thumb use – 1 point*



*Form a bowl out of play doh: ages 18 months – 4 years*

*Score: how the play doh is held*

*Correct score: right hand no grasp: passive stabilization- 0 points*

*Left hand - radial digital grasp – 7 points*



*Tie shoelaces – ages 8 – 18*

*Score: how the laces are held*

*Correct score: ulnar scissor grasp, no thumb use – 2 points*



*Put pennies into a bank*

*Score: how the penny is held*

*Correct score: variation; tip to non index finger- 5 points*



*Write name: ages 8-18*

*Score: how the pencil is held*

*Correct score: radial scissor grasp – 3 points*

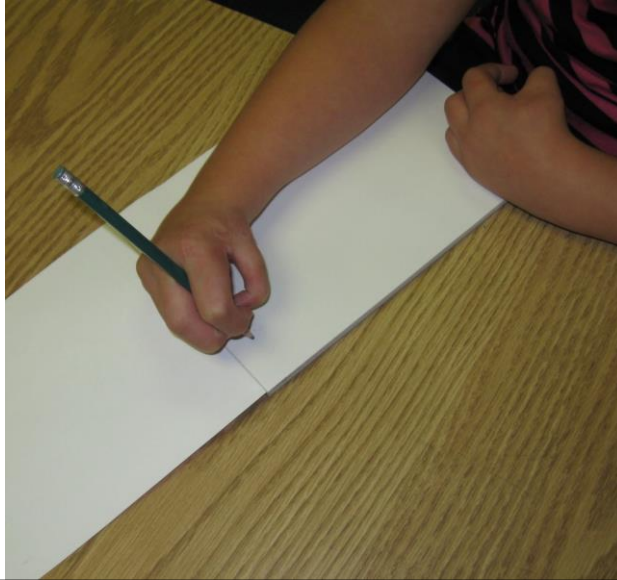


Photo practice where you decide the grasp pattern  
and find the correct answers below in the notes  
pages



*Tie shoelaces into a knot: ages 5-7*  
*Score: how the laces are held*



*Turn a key in padlock: ages 5-7*  
*Score: how the key is held*



*Remove cap from small marker: ages 5-7 years*

*Score: how the marker is held*



*Write name*

*Score: how the pencil is held*



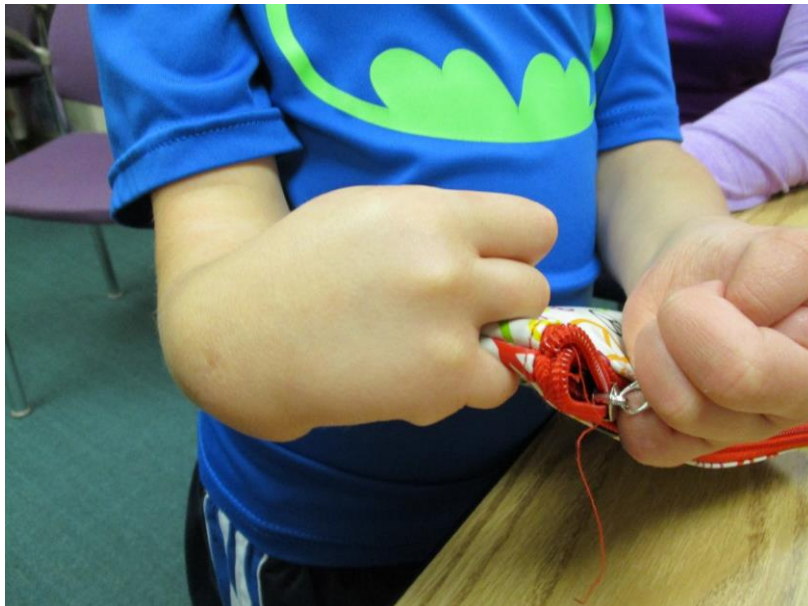
*Write name: ages 8 – 18*

*Score: How the pencil is held*

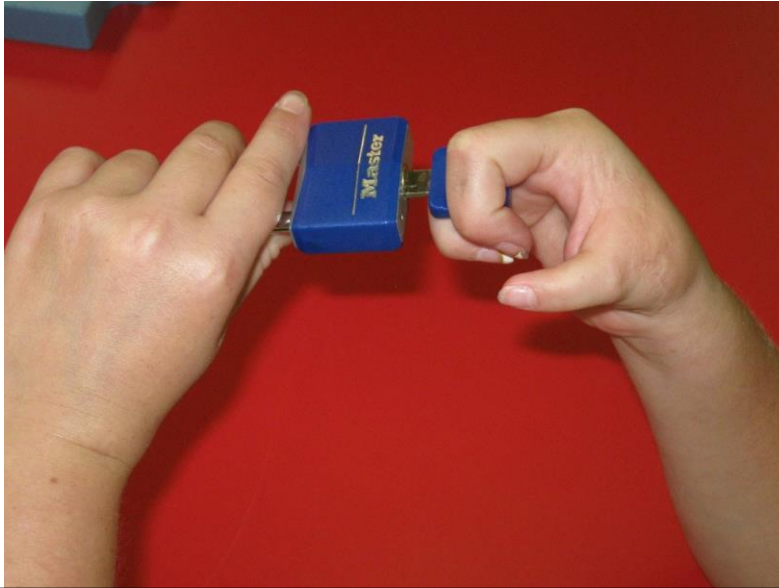


*Open a zippered pencil pouch: ages 18 months – 4 years*

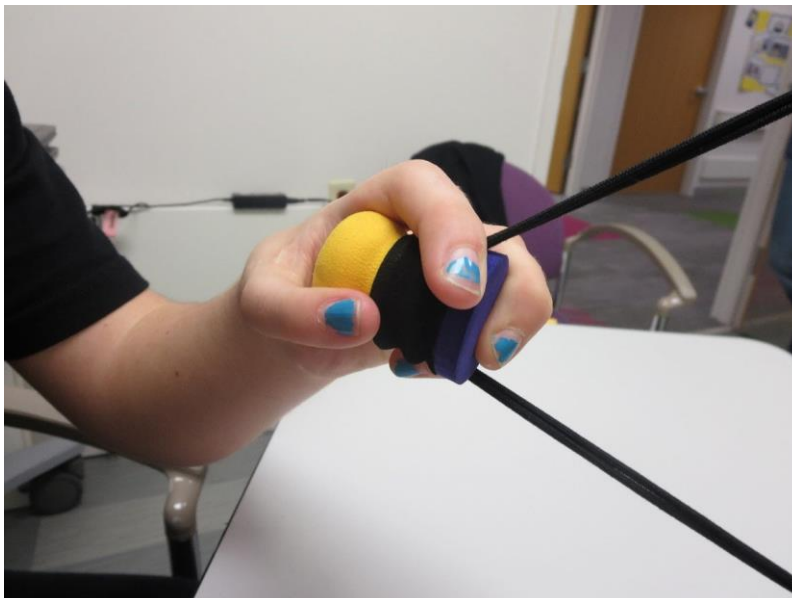
*Score: how the metal zipper tab is held*



*Turn a key in a padlock: ages 5-7*  
*Score: how the key is held*



*Pull foam pull back on sling shot ages 5-7*  
*Score: how the foam pull is held*



*Open zippered pencil pouch*

*Score: how the metal zipper tab is held*



*Pull cap off small marker: ages 5-7*

*Score: how the marker is held*



*Write name: ages 8-18*

*Score: how the pencil is held*



**T-GAP Administration and Test Kit Items    Ages 18 Months - 4 Years**



**Film container and cereal**

Place the container and three cheerios in front of the child. Ask the child to pick up each cheerio and put it in the container.

**Score:** How the cheerio is held



**Metal tab zippered pencil pouch and two markers**

Place two markers in the zippered pencil pouch. Ask the child to unzip the pouch and remove the markers.

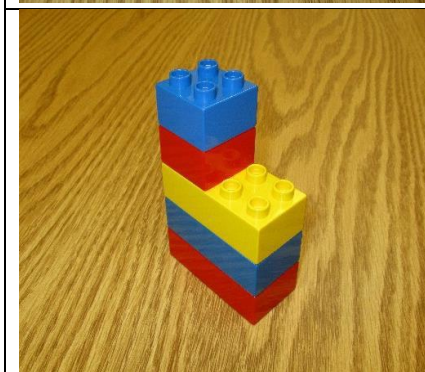
**Score:** How the zippered tab is held



**Large diameter marker**

Ask the child to remove the cap from the marker then put the cap back on tightly and then remove the cap again.

**Score:** How the marker is held



**Five duplo style blocks stacked together**

Ask the child to pull the blocks apart and put them back together again.

**Score:** How the blocks are held



**4-oz. bottle of bubbles with twist-off lid**

Ask the child to remove the lid and put the lid back on.

**Score:** How the bottle is held

## T-GAP Administration and Test Kit Items    Ages 18 Months - 4 Years



### **Full-size container of Moldable Clay**

Demonstrate how to form the clay into a bowl and help to start the shape. Ask the child to make a bowl using their hands to shape it.

**Score:** How the clay is held



### **Medium-size fabric drawstring bag with rope laces**

Put blocks inside the bag and pull the drawstring to close the bag. Demonstrate how to use your hands to fully open the drawstring bag. Close the bag and ask the child to open the bag to see what is inside.

**Score:** How the bag is held



### **Box of 8 crayons**

Place the box of crayons in front of the child. Ask the child to open the box and pull out his / her favorite color crayon. If you do not observe the grasp pattern, ask the child to pull out his second favorite color crayon.

**Score:** How the crayon is held



### **Child size sock**

Have the child sit in a chair or on the floor. Ask the child to remove one shoe and put the sock on.

**Score:** How the sock is held open

**The Thumb Grasp and Pinch Assessment  
T-GAP Score form  
18 months – 4 years**



T-GAP Activity	LEFT (Score 0-7)	RIGHT (Score 0-7)
Pick up 3 Cheerios one at a time and release into a film container <b>(tip pinch)</b> <i>Score how Cheerio is held</i>		
Open a zippered pencil case and remove 2 markers <b>(lateral key pinch)</b> <i>Score how zipper tab is held</i>		
Pull cap off a large diameter marker <b>(small grasp)</b> <i>Score how marker is held</i>		
Separate 5 Duplo style blocks that are stacked together <b>(medium grasp)</b> <i>Score how blocks are stabilized</i>		
Open a container of bubbles <b>(large grasp)</b> <i>Score how container is stabilized</i>		
Form moldable clay into a bowl <b>(manipulation)</b> <i>Score how moldable clay is held</i>		
Open a drawstring bag <b>(resistance)</b> <i>Score how bag is held when opened</i>		
Open a box of 8 crayons and remove one <b>(school)</b> <i>Score how crayon is held</i>		
Put sock on over toes <b>(ADL)</b> <i>Score how sock is held open</i>		

**Grasp and Pinch Style Scoring**

- 0 No Grasp, Passive Stabilization
- 1 Palmar Grasp, Finger Flexion; No Thumb Use
- 2 Ulnar Scissor Grasp; No Thumb Use
- 3 Radial Scissor Grasp; No thumb Use
  
- 4 Cylindrical Grasp; Thumb to Fingers
- 5 Lateral Key Pinch; Thumb to Index
- 6 Tip Pinch; Thumb to Finger Tip
- 7 Tripod Pinch; Thumb to Distal Index/Long

**T-GAP Total Score**

Left Hand \_\_\_\_\_/63  
Right Hand \_\_\_\_\_/63

**Number of Grasp Styles: Points 1-7**

Left Hand \_\_\_\_\_  
Right Hand \_\_\_\_\_

**Thumb Use: Points 4-7**

Left Hand \_\_\_\_\_/9  
Right Hand \_\_\_\_\_/9





**Sturdy medium size piggy bank and 3 pennies**

Place the bank and three pennies in front of the child. Ask the child to pick up and put each penny into the piggy bank

**Score:** How the penny is held



**Padlock (2 3/8" tall) with vinyl-coated key**

Demonstrate how to insert the key and turn it to open the padlock then demonstrate how to relock the padlock. Ask the child to unlock and lock the padlock two times.

**Score:** How the key is held



**Small circumference marker (3/8" wide)**

Place a marker in front of the child. Ask the child to pull off the cap then put the cap on tightly then pull the cap off again.

**Score:** How the marker is held



**Kaleidoscope (9 " long and 2 1/2" wide)**

Demonstrate how to use the kaleidoscope by holding it horizontally and looking through it while rotating the end. Ask the child to look through the kaleidoscope and turn the end three times.

**Score:** How the kaleidoscope is held



**1 pound peanut butter jar (3" wide and 5" tall)**

Place the peanut butter jar in front of the child and ask the child to take the cover off and put the cover back on.

**Score:** How the jar is held

**Full-size container of moldable clay**

Demonstrate how to form moldable clay into a bowl then form into a ball and place on the table. Ask the child to make a bowl. You can help start the shape if needed.

**Score:** How the clay is held

**Slingshot with foam pull**

Demonstrate how to hold the slingshot, grasp the round end of the pull and pull back with moderate force then release. Ask the child to do this sequence twice

**Score:** How the foam pull is held

**6" x 9" white drawing pad and a crayon**

Place a peanut butter jar on the paper and draw a circle around it with the crayon. Ask the child to color in the circle with the crayon.

**Score:** How the crayon is held

**Child-size lace-up shoe with long, flat laces**

Place the shoe in front of the child and ask the child to tie a knot with the laces. You can show how to make a knot if needed.

**Score:** How the laces are held

**The Thumb Grasp and Pinch Assessment**  
**T-GAP Score form**  
**5 years – 7 years**



T-GAP Activity	LEFT (Score 0-7)	RIGHT (Score 0-7)
Pick up 3 pennies one at a time and release into a piggy bank <b>(tip pinch)</b> <i>Score how penny is held</i>		
Turn a key to open a padlock <b>(lateral key pinch)</b> <i>Score how key is held</i>		
Pull cap off a small diameter marker <b>(small grasp)</b> <i>Score how marker is held</i>		
Turn end of kaleidoscope 3 times <b>(medium grasp)</b> <i>Score how kaleidoscope is held</i>		
Remove cap from a peanut butter jar <b>(large grasp)</b> <i>Score how jar is held</i>		
Form Play-Doh into a bowl <b>(manipulation)</b> <i>Score how Play-Doh is held</i>		
Pull back foam pull on slingshot <b>(resistance)</b> <i>Score how foam pull is held</i>		
Color inside a circle with a crayon <b>(school)</b> <i>Score how crayon is held</i>		
Tie shoelaces into a knot <b>(ADL)</b> <i>Score how laces are held</i>		

**Grasp and Pinch Style Scoring**

- 0 No Grasp, Passive Stabilization
- 1 Palmar Grasp, Finger Flexion; No Thumb Use
- 2 Ulnar Scissor Grasp; No Thumb Use
- 3 Radial Scissor Grasp; No thumb Use
  
- 4 Cylindrical Grasp; Thumb to Fingers
- 5 Lateral Key Pinch; Thumb to Index
- 6 Tip Pinch; Thumb to Finger Tip
- 7 Tripod Pinch; Thumb to Distal Index/Long

**T-GAP Total Score**

Left Hand \_\_\_\_\_/63  
 Right Hand \_\_\_\_\_/63

**Number of Grasp Styles: Points 1-7**


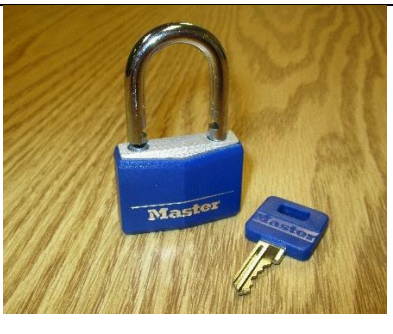

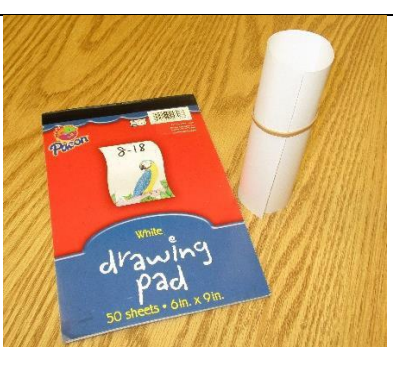

Left Hand \_\_\_\_\_  
 Right Hand \_\_\_\_\_

**Thumb Usage: Points 4-7**



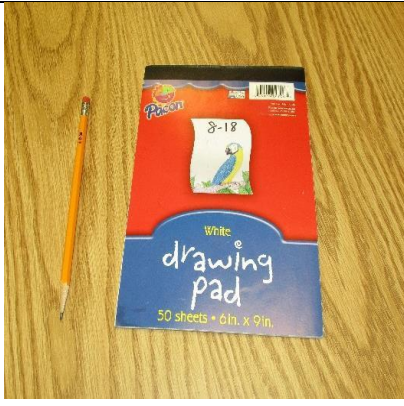

Left Hand \_\_\_\_\_/9  
 Right Hand \_\_\_\_\_/9



**T-GAP Administration and Test Kit Items      Ages 8-18 Years**

	<p><b><u>Plastic zip tie and 5 plastic beads</u></b> Ask the child to thread the plastic beads onto the zip tie one at a time.</p> <p><b>Score:</b> How the bead is held</p>
	<p><b><u>Padlock and vinyl-coated key</u></b> Demonstrate how to insert the key and turn it to open the padlock, then relock the padlock. Ask the child to unlock and lock the padlock two times.</p> <p><b>Score:</b> How the key is held</p>
	<p><b><u>Ballpoint pen with a pull off cap</u></b> Ask the child to pull off the cap and put the cap back on tightly then pull the cap off again.</p> <p><b>Score:</b> How the pen is held</p>
	<p><b><u>6" x 9" sheet of drawing paper and a rubber band</u></b> Demonstrate and ask the child to make a large tube by rolling up the piece of paper and placing the rubber band around the middle. Ask the child to hold the tube and look through the end.</p> <p><b>Score:</b> How the paper tube is held</p>
	<p><b><u>Unopened 1-lb. peanut butter jar</u></b> Ask the child to take the cover off and put the cover back on. Leave the metal seal on top of the jar in place.</p> <p><b>Score:</b> How the jar is held</p>

**T-GAP Administration and Test Kit Items      Ages 8-18 Years**

	<p><b><u>Handheld pencil sharpener and new no. 2 pencil</u></b> Ask child to sharpen the pencil. You must observe at least three rotations of the pencil in the sharpener.</p> <p><b>Score:</b> How the pencil is held</p>
	<p><b><u>Slingshot with foam pull</u></b> Demonstrate how to hold the slingshot upright, grasp the foam pull by the round / bulb end and pull back with moderate force, then release. Ask the child to demonstrate this sequence twice.</p> <p><b>Score:</b> How the foam pull is held</p>
	<p><b><u>6" x 9" drawing pad with a no. 2 sharpened pencil</u></b> Provide the child with an open drawing pad and sharpened no. 2 pencil. Ask the child to write his name on a piece of paper.</p> <p><b>Score:</b> How the pencil is held</p>
	<p><b><u>Child's size lace-up shoe with long, flat laces</u></b> Place the shoe in front of the child and ask the child to tie the shoelaces into a bow. If needed, you can demonstrate how to tie the bow.</p> <p><b>Score:</b> How the laces are held, not the ability to tie the laces</p>

**The Thumb Grasp and Pinch Assessment**  
**T-GAP Score form**  
**8 years – 18 years**



T-GAP Activity	LEFT (Score 0-7)	RIGHT (Score 0-7)
Thread 5 plastic beads onto a zip tie <b>(tip pinch)</b> <i>Score how bead is held</i>		
Turn a key to open a padlock <b>(lateral key pinch)</b> <i>Score how key is held</i>		
Remove cap from a ballpoint pen <b>(small grasp)</b> <i>Score how pen is held</i>		
Make a telescope from a sheet of paper and place a rubber band around it <b>(medium grasp)</b> <i>Score how paper telescope is held</i>		
Remove cap from a peanut butter jar <b>(large grasp)</b> <i>Score how jar is held</i>		
Rotate a pencil 3 times in a handheld pencil sharpener <b>(manipulation)</b> <i>Score how pencil is held</i>		
Pull back foam pull on a slingshot <b>(resistance)</b> <i>Score how foam pull is held</i>		
Write name with a pencil <b>(school)</b> <i>Score how pencil is held</i>		
Tie shoelaces into a bow <b>(ADL)</b> <i>Score how laces are held</i>		

**Grasp and Pinch Style Scoring**

- 0 No Grasp, Passive Stabilization
- 1 Palmar Grasp, Finger Flexion; No Thumb Use
- 2 Ulnar Scissor Grasp; No Thumb Use
- 3 Radial Scissor Grasp; No thumb Use
  
- 4 Cylindrical Grasp; Thumb to Fingers
- 5 Lateral Key Pinch; Thumb to Index
- 6 Tip Pinch; Thumb to Finger Tip
- 7 Tripod Pinch; Thumb to Distal Index/Long

**T-GAP Total Score**

Left Hand \_\_\_\_\_/63  
 Right Hand \_\_\_\_\_/63

**Number of Grasp Styles: Points 1-7**

Left Hand \_\_\_\_\_  
 Right Hand \_\_\_\_\_

**Thumb Usage: Points 4-7**

Left Hand \_\_\_\_\_/9  
 Right Hand \_\_\_\_\_/9



# T-GAP Scoring Guide: No Use of Thumb (0–3 points)

## Standard Grasp Patterns

### No Grasp, Passive Stabilization (0 points)

Passive stabilizing using fingertips or side of hand



### Palmar Grasp, Finger Flexion (1 point)

Finger flexion; all fingers to palm



### Ulnar Scissor Grasp (2 points)

Finger stabilization between small/ring.

If 4 web spaces present also between ring/long fingers



### Radial Scissor Grasp (3 points)

Finger stabilization between the index/long for long/ring fingers



## Variation Grasp Patterns

No variation for no grasp, passive stabilization

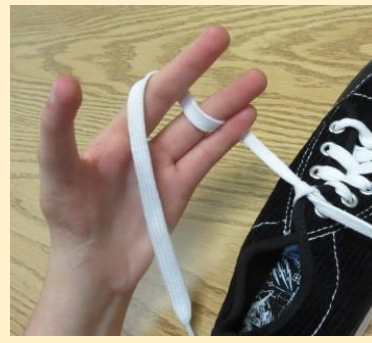
### Distal flexion of fingers (1 point)

Finger flexion without use of palm



### Scissors Multiple Fingers (2 Points)

Weaves objects between multiple fingers



### Distal Finger Scissoring (3 points)

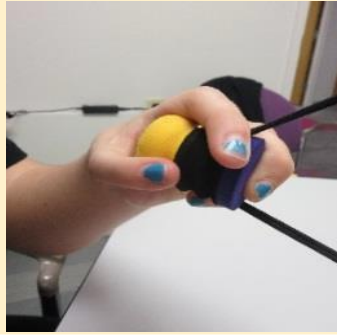
Distal pinch between non adjacent finger tips



# T-GAP Scoring Guide: Use of Thumb (4–7 Points)

## Standard Grasp Patterns

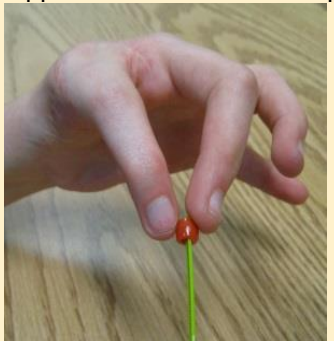
**Cylindrical Grasp; Thumb To All Fingers (4 points)**  
Opposed thumb with proximal grasp of all fingers



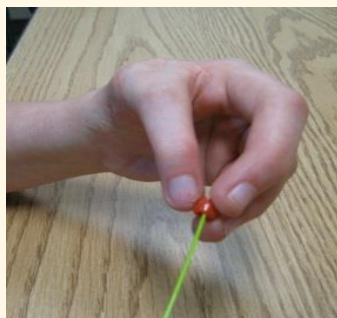
**Lateral Key Pinch (5 points)**  
Opposes thumb to side of index finger



**Tip Pinch (6 points)**  
Opposes thumb to side or tip of index finger



**Tripod Pinch (7 points)**  
Opposes thumb to index and long fingers



## Variation Grasp Patterns

**Distal Cylindrical (5 points)**  
Distal grasp of all fingers to opposed thumb



**Lateral Cylinder (5 points)**  
Encircling grasp of thumb and index finger



**Tip to Non-Index Finger (5 points)**  
Opposes thumb to tip of ring, long or small finger



**Tripod Pinch (6 points)** Supports objects proximally thumb/index/long fingers





