



National Health and Nutrition Examination Survey (NHANES)

National Youth Fitness Survey (NYFS)
Test of Gross Motor Development (TGMD-2)
Procedures Manual



April 2012

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1. OVERVIEW OF THE TEST OF GROSS MOTOR DEVELOPMENT (TGMD-2)

1.1 Background*

Gross motor skills involve the large muscles of the body that enable major body movement such as walking, maintaining balance, coordination, jumping, and reaching. Gross motor skills depend on both muscle tone and strength. Children with better-developed motor skills may find it easier to be active and engage in more physical activity than those with less-developed motor skills. Children with poorer motor skill performance have been found to be less active than children with better-developed motor skills¹. The relationship between motor skill performance and physical activity may be important to the health of children, particularly in obesity prevention.

Locomotor skills are those that require fluid movements of the body as the child moves in one direction or the other. Object control skills are those that demonstrate efficient throwing, striking, and catching movements. By age 3, most children can go up and down stairs by alternating their feet, jump in place, and throw overhand. By age 4, most children can catch a bounced ball, jump with a running start, and pedal a tricycle. By age 5, most children can gallop, leading with one foot, roll like a log, and propel themselves on a swing.

The Test of Gross Motor Development – Second Edition (TGMD-2) (<http://www.proedinc.com/customer/productView.aspx?ID=1776>) will be used to test the motor skills of all 3-5-year-olds participating in the National Youth Fitness Survey (NYFS). The TGMD-2 is a norm-referenced measure of common gross motor skills that develop early in life. It has been used by researchers in several countries²⁻⁹ and combines fun activities with a procedure that is valid and reliable. The TGMD-2 is composed of two subtests for gross motor development—Locomotor and Object Control—both of which have six skills that assess a different aspect of gross motor development.

- **Locomotor:** run, gallop, hop, leap, horizontal jump, slide.
- **Object Control:** striking a stationary ball, stationary dribble, kick, catch, overhand throw, and underhand roll.

* List of references is included in Chapter 5.

Each gross motor skill includes several behavioral components that are presented as performance criteria. For example, performance criteria for the run are (1) arms move in opposition to legs, elbows bent; (2) brief period where both feet are off the ground; (3) narrow foot placement landing on heel or toe (i.e., not flat-footed); and (4) nonsupport leg bent approximately at 90 degrees (i.e., close to buttocks). If the child performs a performance criterion correctly, the examiner will record a “1.” If the child does not perform a performance criterion correctly, the examiner will record a “0.” Partial scores to show that the child displays the criterion, but is inconsistent, are not allowed. If the SP refuses to perform the skill, he or she is coded as “Did Not Participate.”

1.2 Key Elements

	TGMD-2
Ages	3 – 5 years
Eligibility	3 – 5 years; consented SPs
Exclusions	Physical limitations requiring a wheelchair; amputations of the leg, foot, arm, or hand; paralysis of one or both arms or hands; hand/arm/shoulder/leg surgery in last 3 months; mental impairment
Risks	Slight risk of sprain or strain to leg or ankle
Equipment	TGMD-2 kit, including Examiner’s Manual 8”-10” playground ball, two 4” plastic balls, three tennis balls, 4”-5” beanbag, soccer ball, two traffic cones, plastic bat, two Nerf balls, batting tee, electrical type tape, ball bag (for storage)
Time Allotment	15-20 minutes
Report of Findings	No ROF is provided

2. EQUIPMENT, SUPPLIES AND SET-UP

2.1 Test Elements

The following table lists the equipment, including space, needed for each of the skills tested. The space that is required has been modified from the original test in order that it can be conducted in the mobile center (MC).

Exhibit 2-1. Equipment and space requirements for TGMD-2

Skill	Minimum space or line required	8"-10" plastic playground or soccer ball	4" plastic ball	Tennis ball	4"-5" beanbag	2 traffic cones/tape	Plastic bat	Nerf ball	Batting tee
Run	28'					X			
Gallop	16'					X or tape			
Leap	14'				X				
Horizontal jump	10'					X			
Slide	10-15'					X			
Striking stationary ball							X	X	X
Stationary dribble	15 sq ft area	X							
Catch	10'		X						
Kick	10-15'	X			X				
Overhand throw	10-15'			X					
Underhand roll	10-15'			X					

A strip of brightly colored electrical tape is applied to the floor, extending from the curtain door of Exam Room 1 to a foot out from the back wall for visual direction. The activities that require a straight line, such as the slide and gallop, are performed along this strip of tape. Another strip of tape crosses the long strip 10 feet out from the back wall. The intersection of the tape is a visual clue for skills like the jump. The beanbag used for the leap is also placed on the junction of the tape. The back wall has been covered with 4 feet of padding from the floor up to prevent injuries and damage to walls.

2.2

Supplies

- Mild, all purpose cleaner and clean cloths or disinfectant wipes for wiping down the equipment. The balls and the handle of the bat used by the SP should be wiped **before each use**.
- Assorted colors of poly spots (round vinyl instructor spot markers).
- Ball bag to hang equipment on wall.

Exhibit 2-2. Ball bag with equipment



3. EXAMINATION PROTOCOL

3.1 Eligibility

All sample persons (SPs) aged 3 – 5 are eligible for the TGMD-2. The parent’s answers to questions that are administered through the Nurse Review will exclude SPs who have had a recent injury, surgery, or other disability that could inhibit or prevent their performance. If the SP is ineligible, the SP will not be listed in the TGMD-2 application on the computer.

3.2 Examination Conditions

Test conditions should be arranged prior to beginning the test to help minimize administration time and distractions.

- All materials needed for testing should be readily available.
- Gather the balls for the striking, catching, kicking, and throwing skills to minimize time spent on ball retrieval. Wipe the balls and the handle of the bat with a disinfectant cloth to prevent the spread of germs. Place the equipment needed for each skill in the ball bag hung on the wall.
- SPs should wear rubber-soled shoes to minimize the chance of slipping and falling, and to promote maximum effort in performing the locomotor skills. Shoes and socks are provided on the MC if needed.
- Testing time will vary with the child’s abilities, but the entire TGMD-2 can be given in approximately 15 to 20 minutes.

3.3 Administration Procedures

Standardized procedures must be followed in order to compare a child’s scores to those made by peers in the normative sample. The following requirements are standard for administering the tests most reliably in an attempt to minimize any discriminatory practices by ensuring that the SP understands the examiner’s directions.

1. Give an accurate demonstration and verbal description of the skill to the SP prior to allowing the SP to perform it.
2. Provide a practice trial to ensure that the child understands what to do.
3. Provide an additional demonstration when the child does not appear to understand the task.
4. Administer two test trials and score each performance criterion on each trial.

The examiner has responsibility for controlling or accounting for the obvious variables that can adversely affect the SP's performance (e.g., improper clothing or footwear, amount of space needed, no rest breaks). You should encourage the SP but avoid prompting or otherwise deviating from testing procedures. You may use language such as "*Very good!*" and "*That's great!*" and "*You're doing a great job!*" Remarks such as "*Throw hard!*" or "*Jump as far as you can!*" also are appropriate. However, comments that appear to reflect on the level of the SP's ability, such as "*That's right!*" should not be used during test administration.

To achieve a valid interpretation of an SP's TGMD-2 performance, the scales must be administered exactly as specified in the following sections taken from the *TGMD-2 Examiner's Manual*. Each section provides the examiner with the name of the skill, materials needed, directions for administration, performance criteria, an illustration of the skill tested and a script to use when describing the exercise to the SP (Exhibits 3-1 and 3-2).

The Integrated Survey Information System (ISIS) is designed so that the skills can be administered in any order. Depending on the SP's behavior, the examiner may choose to do some skills in a specific progression to entice the SP to perform and complete them. The criteria are included without illustrations in the ISIS application that is used for recording the SP's score for each of the skills. Therefore, the examiner must be thoroughly familiar with the illustrated guide before administering the test.

3.4 Examination Procedures

If not done previously, introduce yourself to the SP, making good eye contact and encouraging small talk such as: "*We are going to play some games like running and throwing the ball.*" If the SP is wearing very loose clothing so that you will not be able to accurately rate the criteria, have him or her change into the NYFS-supplied shorts. Baggy shirts can be pulled back and held with a hair clip. Check that the SP's shoelaces are tied securely and that no loose jewelry or other items will interfere with the test procedures.

Open the TGMD component in ISIS and log the SP into the system. The first step is to determine the SP's preferred hand and foot.

- Determine preferred hand by doing a “High-Five.”
- Determine preferred foot by asking the SP to kick the ball.

The locomotor skills are usually done prior to the object control skills since children like to play with balls and may be encouraged to do the locomotor skills by promising the ball activities after completing the others. While it is recommended that you begin with the “Run” which is the first test shown on the screen in the locomotor skill set, you may need to revise the order of the skills if the hallway that is used for the run is momentarily congested with other SPs and families. You do not need to follow the exact sequence of skills as listed in the tabs.

Demonstrate the selected skill, following the descriptions and text illustrated in Exhibits 3-1 and 3-2 below.

- Ask the SP to stand on a poly spot that is positioned so that he or she is not in your way but can still see you demonstrate the skill.
- Prepare yourself and the SP before starting a practice or test trial. Remind him or her to stand on the poly spot and wait for you to say “GO!”
- If the SP appears to have difficulty understanding your directions during his or her practice, demonstrate it again.
- If you need to review a specific performance criterion, ask the SP to repeat the test and watch for only that movement and score it with the test that had the ambiguous movement. Enter the score in ISIS after each test.
- **REMEMBER** – at least one practice and then two test trials. If the SP refuses to participate, check the “Did Not Participate” box on the screen for that skill.

Exhibit 3-1. Description of the six locomotor subtests

Locomotor Subtest

Skill	Materials	Directions	Performance Criteria
1. Run	60 feet of clear space, and two cones	Place two cones 50 feet apart. Make sure there is at least 8 to 10 feet of space beyond the second cone for a safe stopping distance. Tell the child to run as fast as he or she can from one cone to the other when you say "Go." Repeat a second trial.	<ol style="list-style-type: none"> 1. Arms move in opposition to legs, elbows bent 2. Brief period where both feet are off the ground 3. Narrow foot placement landing on heel or toe (i.e., not flat footed) 4. Nonsupport leg bent approximately 90 degrees (i.e., close to buttocks)

Skill Illustration



Script for Run:

Run as fast as you can and stop at this cone!

Skill	Materials	Directions	Performance Criteria
2. Gallop	25 feet of clear space, and tape or two cones	Mark off a distance of 25 feet with two cones or tape. Tell the child to gallop from one cone to the other. Repeat a second trial by galloping back to the original cone.	<ol style="list-style-type: none"> 1. Arms bent and lifted to waist level at takeoff 2. A step forward with the lead foot followed by a step with the trailing foot to a position adjacent to or behind the lead foot 3. Brief period when both feet are off the floor 4. Maintains a rhythmic pattern for four consecutive gallops

Skill Illustration



Script for Gallop:

I am going to gallop like a horse. Watch me gallop!

If SP skips instead, say: ***That was a great skip! Watch me gallop again. Now I want to see if you can gallop.***

Exhibit 3-1. Description of the six locomotor subtests (continued)

Skill	Materials	Directions	Performance Criteria
3. Hop	A minimum of 15 feet of clear space	Tell the child to hop three times on his or her preferred foot (established before testing) and then three times on the other foot. Repeat a second trial.	<ol style="list-style-type: none"> 1. Nonsupport leg swings forward in pendular fashion to produce force 2. Foot of nonsupport leg remains behind body 3. Arms flexed and swing forward to produce force 4. Takes off and lands three consecutive times on preferred foot 5. Takes off and lands three consecutive times on nonpreferred foot

Skill Illustration

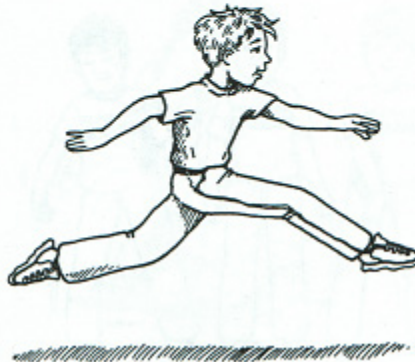


Script for Hop:

I want to see if you can hop on ONE foot. Watch me hop!

Skill	Materials	Directions	Performance Criteria
4. Leap	A minimum of 20 feet of clear space, a beanbag, and tape	Place a beanbag on the floor. Attach a piece of tape on the floor so it is parallel to and 10 feet away from the beanbag. Have the child stand on the tape and run up and leap over the beanbag. Repeat a second trial.	<ol style="list-style-type: none"> 1. Take off on one foot and land on the opposite foot 2. A period where both feet are off the ground longer than running 3. Forward reach with the arm opposite the lead foot

Skill Illustration



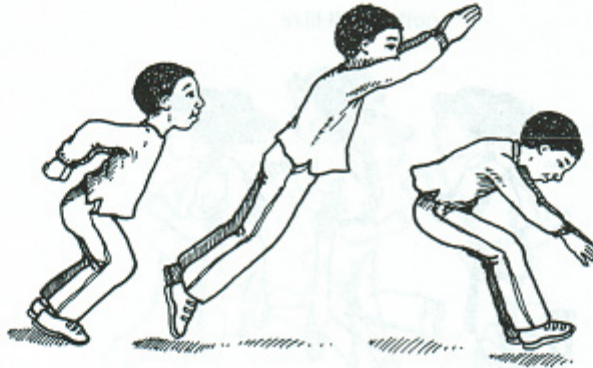
Script for Leap:

I want you to run up and leap over the bean bag. Watch me leap!

Exhibit 3-1. Description of the six locomotor subtests (continued)

Skill	Materials	Directions	Performance Criteria
5. Horizontal Jump	A minimum of 10 feet of clear space and tape	Mark off a starting line on the floor. Have the child start behind the line. Tell the child to jump as far as he or she can. Repeat a second trial.	<ol style="list-style-type: none"> 1. Preparatory movement includes flexion of both knees with arms extended behind body 2. Arms extend forcefully forward and upward reaching full extension above the head 3. Take off and land on both feet simultaneously 4. Arms are thrust downward during landing

Skill Illustration

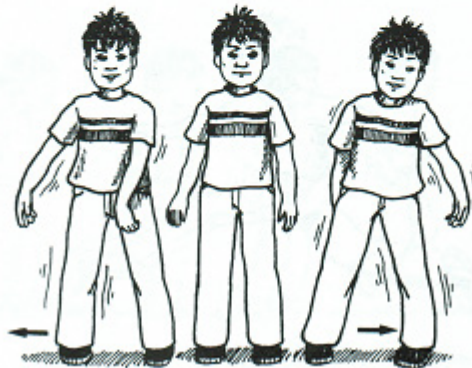


Script for Horizontal Jump:

I want to see how far you can jump! One big jump!

Skill	Materials	Directions	Performance Criteria
6. Slide	A minimum of 25 feet of clear space, a straight line, and two cones	Place the cones 25 feet apart on top of a line on the floor. Tell the child to slide from one cone to the other and back. Repeat a second trial.	<ol style="list-style-type: none"> 1. Body turned sideways so shoulders are aligned with the line on the floor 2. A step sideways with lead foot followed by a slide of the trailing foot to a point next to the lead foot 3. A minimum of four continuous step-slide cycles to the right 4. A minimum of four continuous step-slide cycles to the left

Skill Illustration



Script for Slide:

Watch me! I am going to step - slide like this. Then I am going to stop and slide back.

Exhibit 3-2. Description of the six object control subtests

Object Control Subtest

Skill	Materials	Directions	Performance Criteria
1. Striking a Stationary Ball	A 4-inch lightweight ball, a plastic bat, and a batting tee	Place the ball on the batting tee at the child's belt level. Tell the child to hit the ball hard. Repeat a second trial.	<ol style="list-style-type: none"> 1. Dominant hand grips bat above nondominant hand 2. Nonpreferred side of body faces the imaginary tosser with feet parallel 3. Hip and shoulder rotation during swing 4. Transfers body weight to front foot 5. Bat contacts ball

Skill Illustration



Script for Striking a Ball:
Watch me hit the ball!

Skill	Materials	Directions	Performance Criteria
2. Stationary Dribble	An 8- to 10-inch playground ball for children ages 3 to 5; a basketball for children ages 6 to 10; and a flat, hard surface	Tell the child to dribble the ball four times without moving his or her feet, using one hand, and then stop by catching the ball. Repeat a second trial.	<ol style="list-style-type: none"> 1. Contacts ball with one hand at about belt level 2. Pushes ball with fingertips (not a slap) 3. Ball contacts surface in front of or to the outside of foot on the preferred side 4. Maintains control of ball for four consecutive bounces without having to move the feet to retrieve it

Skill Illustration

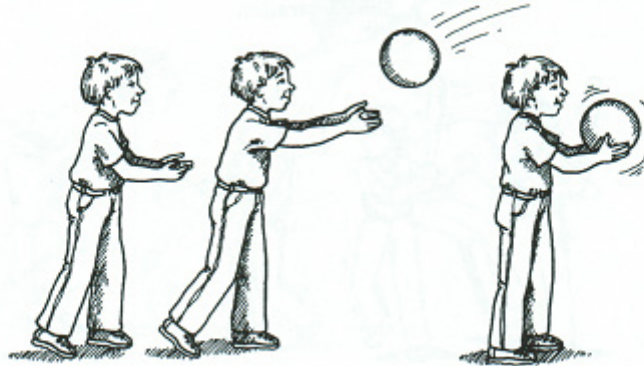


Script for Dribble:
Bounce the ball 4 times and catch!

Exhibit 3-2. Description of the six object control subtests (continued)

Skill	Materials	Directions	Performance Criteria
3. Catch	A 4-inch plastic ball, 15 feet of clear space, and tape	Mark off two lines 15 feet apart. The child stands on one line and the tosser on the other. Toss the ball underhand directly to the child with a slight arc aiming for his or her chest. Tell the child to catch the ball with both hands. Only count those tosses that are between the child's shoulders and belt. Repeat a second trial.	<ol style="list-style-type: none"> 1. Preparation phase where hands are in front of the body and elbows are flexed 2. Arms extend while reaching for the ball as it arrives 3. Ball is caught by hands only

Skill Illustration



Script for Catch:

Watch me catch the ball. Then I am going to throw the ball to you and you are going to catch it.

Skill	Materials	Directions	Performance Criteria
4. Kick	An 8- to 10-inch plastic, playground, or soccer ball; a beanbag; 30 feet of clear space; and tape	Mark off one line 30 feet away from a wall and another line 20 feet from the wall. Place the ball on top of the beanbag on the line nearest the wall. Tell the child to stand on the other line. Tell the child to run up and kick the ball hard toward the wall. Repeat a second trial.	<ol style="list-style-type: none"> 1. Rapid continuous approach to the ball 2. An elongated stride or leap immediately prior to ball contact 3. Nonkicking foot placed even with or slightly in back of the ball 4. Kicks ball with instep of preferred foot (shoelaces) or toe

Skill Illustration



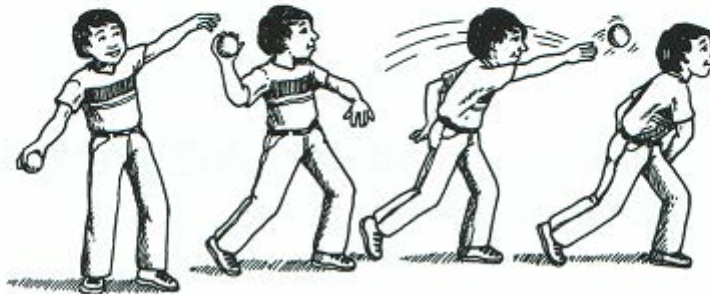
Script for Kick:

Watch me run up and kick the ball!

Exhibit 3-2. Description of the six object control subtests (continued)

Skill	Materials	Directions	Performance Criteria
5. Overhand Throw	A tennis ball, a wall, tape, and 20 feet of clear space	Attach a piece of tape on the floor 20 feet from a wall. Have the child stand behind the 20-foot line facing the wall. Tell the child to throw the ball hard at the wall. Repeat a second trial.	<ol style="list-style-type: none"> 1. Windup is initiated with downward movement of hand/arm 2. Rotates hip and shoulders to a point where the nonthrowing side faces the wall 3. Weight is transferred by stepping with the foot opposite the throwing hand 4. Follow-through beyond ball release diagonally across the body toward the nonpreferred side

Skill Illustration

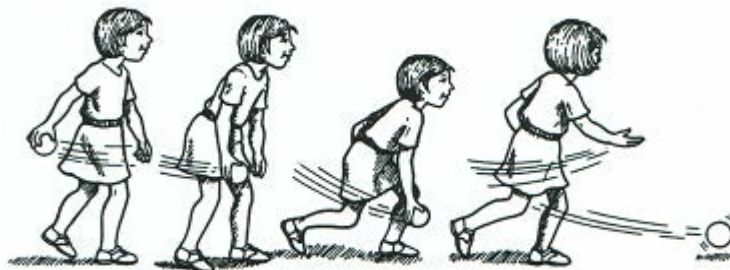


Script for Overhand throw:

Watch me throw the ball as hard as I can. Now you throw the ball.

Skill	Materials	Directions	Performance Criteria
6. Underhand Roll	A tennis ball for children ages 3 to 6; a softball for children ages 7 to 10; two cones; tape; and 25 feet of clear space	Place the two cones against a wall so they are 4 feet apart. Attach a piece of tape on the floor 20 feet from the wall. Tell the child to roll the ball hard so that it goes between the cones. Repeat a second trial.	<ol style="list-style-type: none"> 1. Preferred hand swings down and back, reaching behind the trunk while chest faces cones 2. Strides forward with foot opposite the preferred hand toward the cones 3. Bends knees to lower body 4. Releases ball close to the floor so ball does not bounce more than 4 inches high

Skill Illustration



Script for Underhand roll:

Roll the ball between the cones!

3.4.1 Scoring Directions

The examiner enters a “1” for successful completion, or a “0” for failed attempt, for each of the performance criterion listed for the skill. There are no partial marks. If the SP refuses to do any of the tests, the examiner should check the “Did not Participate” box on the screen for that skill.

3.4.2 Report of Findings

No report of findings will be given to the study participants.

4. INTEGRATED SURVEY INFORMATION SYSTEM (ISIS) DATA ENTRY

4.1 General Screen Information

To begin the examination, click the “Logon SP” icon, the first icon on the left in the standard toolbar. ISIS will present a dialog box that asks for the name and password of the examiner. Wand the barcode on the SP’s information sheet or type the SP’s ID number to log the SP into the component. This will activate a dialog box (Exhibit 4-1) containing descriptive information about the SP (i.e., name, SP ID, age, etc.) Verify that the correct participant name appears on the screen. Click OK to initiate the examination.

Exhibit 4-1. Logon SP screen

Sample Person ID:		Sample Person Name:	
<input type="text" value="765637"/>		<input type="text" value="765637 - Smith4"/>	
Last Name:	<input type="text" value="SMITH4"/>	Suffix:	<input type="text"/>
First Name:	<input type="text" value="MOLLY"/>	Middle Name:	<input type="text"/>
Date of Birth:	<input type="text" value="07/01/2007"/>		
Gender:	<input type="text" value="Female"/>	Age at Interview:	<input type="text" value="4 years"/>
Special Considerations:	<input type="text"/>		

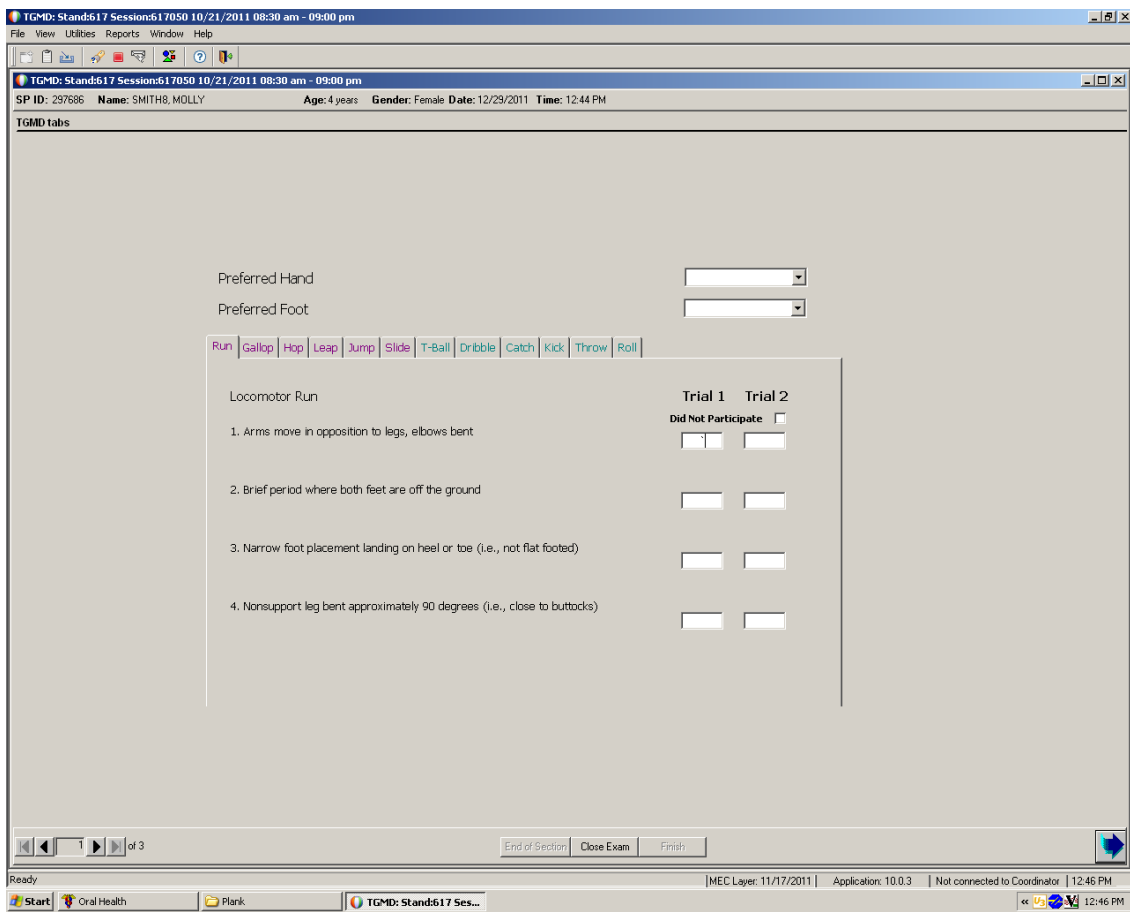
All ISIS screens have similar characteristics. As shown below (Exhibit 4-2), at the very top of the screen is a title bar containing the component name (TGMD), Stand number, Session number, and Session date and time. Below this are the menu bar and standard toolbar icons, which provide software application commands and shortcuts. Under the standard toolbar sits a second title bar that reconfirms the component name, Stand number, Session number, and Session date and time. Below the second title bar is the SP ID, Name, Age, Gender, and current date and time. The component screen name (TGMD Tabs) lies in the upper left of the main window area.

The middle of the screen displays places to enter data for the SP’s preferred hand and foot and a series of tabs for each of the skills being tested. **Click on the tabs to progress through the examination.**

At the bottom left corner of the screen is the ISIS screen number and a set of arrow buttons for navigating the screens: the far left button moves to the first screen and the far right button moves the next screen. At the bottom right corner of the screen is a large blue arrow. **When all of the test skills are complete, click on the large blue arrow to advance to the TGMD Test Summary screen.**

In the middle of the bottom of the screen are two buttons: Close Exam and Finish. Clicking Close Exam will delete any data captured on the current screen, terminate the exam, and code the exam status as Partial or Not Done. **NEVER click the Close Exam button unless the exam must be discontinued and there is no other appropriate means to exit the application.** Click the Finish button at the end of the exam.

Exhibit 4-2. Screen showing skill tabs for TGMD



4.2 Recording the Results

Determine the SP's preferred hand and foot and enter the information in the two corresponding boxes above the set of skill tabs. Select the skill tab that you want to test and click it. As shown in Exhibit 4-2 above, the run tab lists the performance criteria that are listed for the Run Skill in Exhibit 3-1. After observing the SP's first test run, enter a "1" in the box corresponding to the criteria if the SP accurately performed it, or a "0" if not. You can answer the criteria in any order, but once you enter a score, ISIS will not let you leave the screen without completing all of the blanks. However, you can delete the scores if you have made a mistake. If the SP refuses to do the test, check the box for "Did Not Participate."

Exhibit 4-3. Completed screen for run skill

SP ID: 297686 Name: SMITH, MOLLY Age: 4 years Gender: Female Date: 12/29/2011 Time: 12:54 PM

TGMD tabs

Preferred Hand: Right
Preferred Foot: Right

Run Gallop Hop Leap Jump Slide T-Ball Dribble Catch Kick Throw Roll

Locomotor Run	Trial 1	Trial 2
1. Arms move in opposition to legs, elbows bent	1	1
2. Brief period where both feet are off the ground	1	1
3. Narrow foot placement landing on heel or toe (i.e., not flat footed)	0	0
4. Nonsupport leg bent approximately 90 degrees (i.e., close to buttocks)	0	0

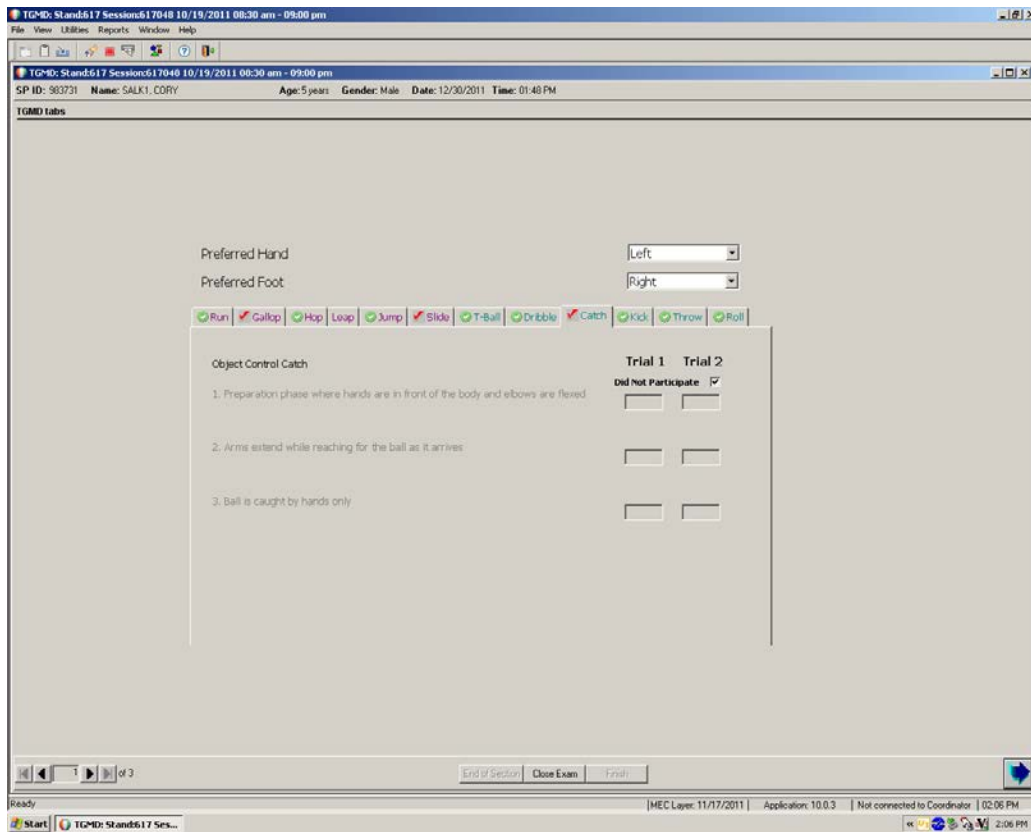
Did Not Participate

Ready | MEC Layer: 11/17/2011 | Application: 10.0.3 | Not connected to Coordinator | 12:54 PM

4.3 Skills Test Status

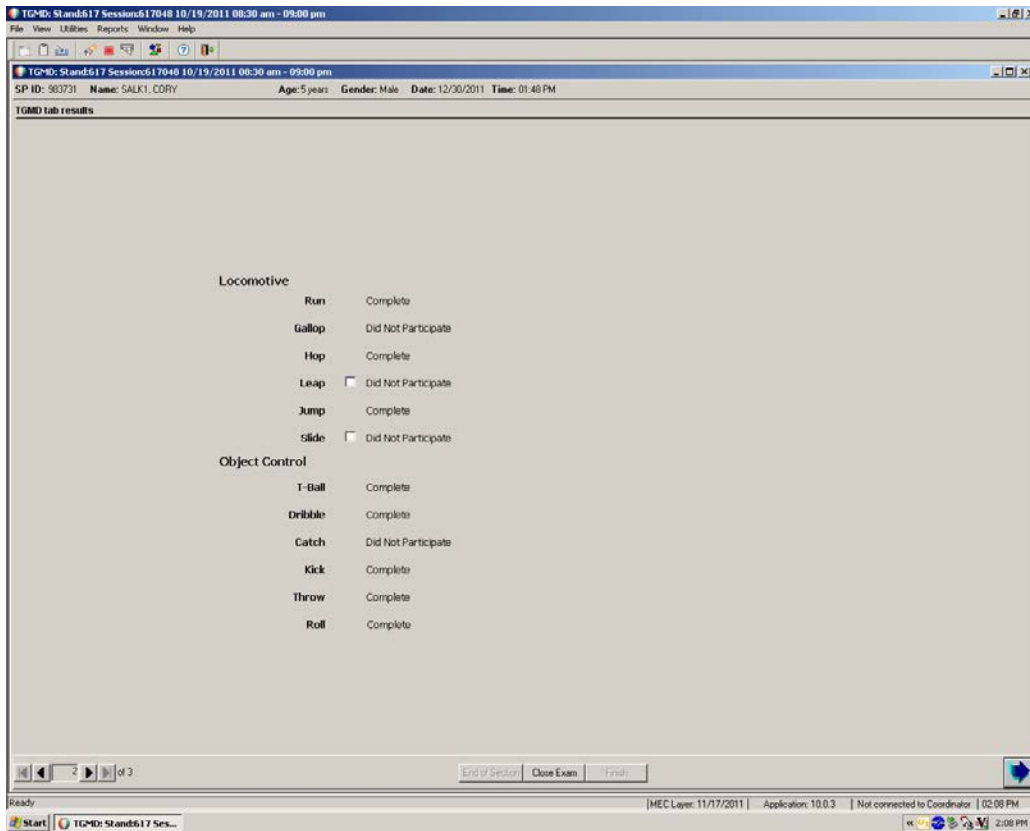
As you complete the skills, the tabs are given a green check for completed and a red check if the “Did Not Participate” box was checked. In Exhibit 4-4 below, Run, Hop, Leap, T-Ball, Dribble, Kick, Throw, and Roll are shown as completed. Gallop, Slide, and Catch are shown as “Did Not Participate” and Leap does not have a check because no data were entered for that skill.

Exhibit 4-4. Status of tests as shown by checks on skill tabs



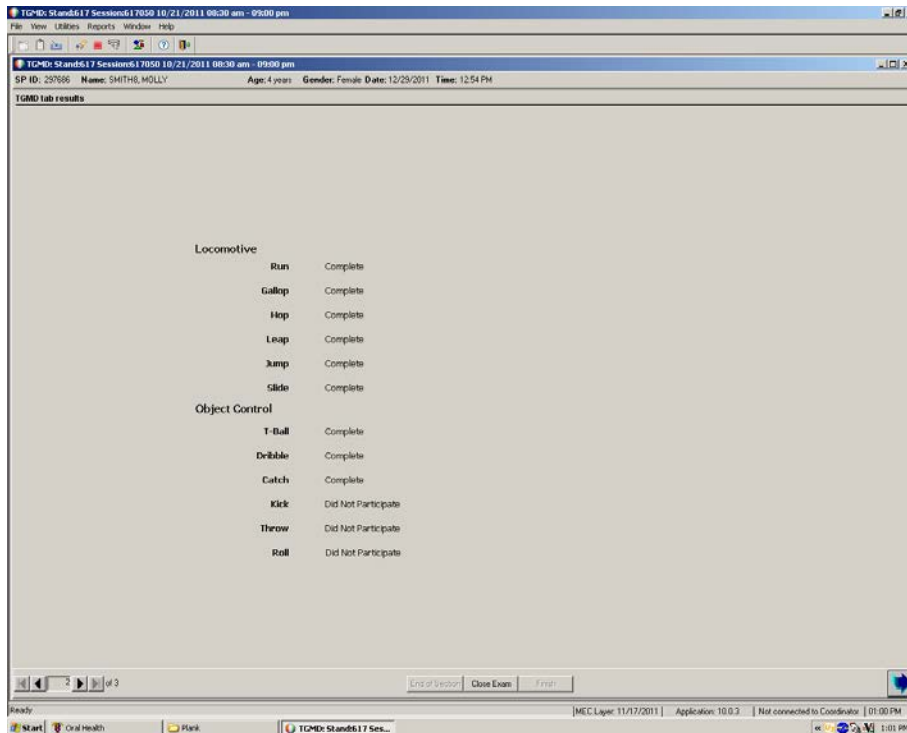
Clicking the large blue arrow takes you to the TGMD tab results screen (Exhibit 4-5) which shows those skills that were scored (Completed), those skills that were checked as “Did Not Complete” and those skills that were skipped (blank white box).

Exhibit 4-5. TGMD tab results screen



Click the back arrow in the lower left corner to return to the first screen and click on the skill tabs that were not completed. Either have the SP perform the test or check the box “Did Not Complete.” All of the skills on the tab results screen should show “Complete” or “Did Not Participate” before clicking the blue arrow to finish the exam (Exhibit 4-6).

Exhibit 4-6. TGMD tab results screen showing final status of tested skills



4.4 Post-Exam Procedures

4.4.1 Component Status

After all of the fields are completed and the blue arrow is clicked, a final screen will appear with the SP status indicated as described below:

- Complete (≥ 10 skills completed);
- Partial (4 – 9 skills completed); and
- Not done (≤ 3 skills completed).

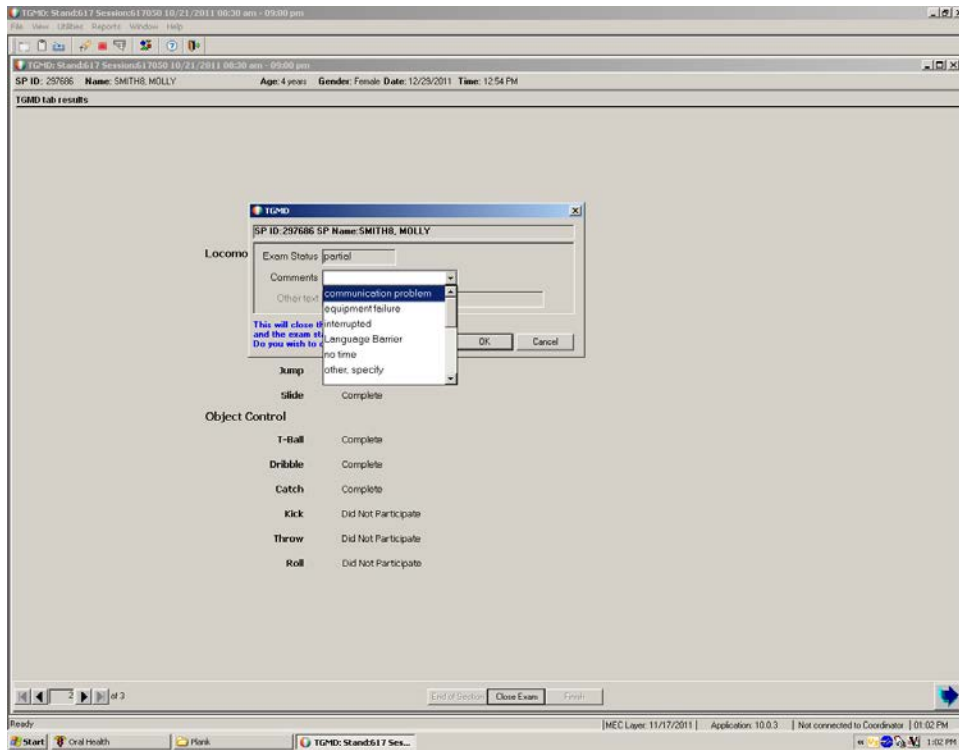
If the status is Partial or Not Done, a reason must be provided. In addition to the standard comment codes described in the Table 4-1 below, the last 4 codes listed are specific to the TGMD.

Table 4-1. Comment Code descriptions

Comment Code	Use When
Communication problem	SP did not appear to understand or follow instructions; cognitive deficit; other communication impairment.
Equipment failure	Problem with test equipment or the ISIS system.
Interrupted	Exam was interrupted, usually for a MC-wide emergency, and cannot be completed by the SP.
Language barrier	Exam could not be accomplished because of a language barrier; SP does not speak English and interpreter unavailable.
No time	Session ended.
Other, specify	Reason cannot be coded under any other category; reason is a safety type issue; issue is a physical limitation not covered in the pretest questions. A brief explanation in the comment field is required.
Physical limitation	ISIS will preselect this code if the SP was excluded based on responses to the pretest questions. If there is a physical limitation not covered in the pretest questions, code it under “Other, specify” and indicate the specific limitation.
Safety exclusion	This code should <u>not</u> be used. Code any safety type issues under “Other, specify” and indicate the specific issue.
SP ill/emergency	SP had to leave abruptly due to a serious, unforeseen circumstance.
SP refusal	SP physically able to undertake the component, but refused.
Refused to cooperate	SP was stubborn/obstinate and would not participate although he/she was physically able and understood directions.
Visibly upset	SP was screaming/crying (e.g., had a tantrum).
Unable to comprehend directions	SP was not able to understand directions and would not even try to do the exercises.
Parental influence	SP’s parents interfered with how the test was executed; demonstrated the exercises incorrectly or negatively affected the SP.

If the Close Exam button is clicked before you click the blue arrow, the same screen will appear with the drop-down box from which you must choose a reason for terminating the exam (Exhibit 4-7). If none of the options apply, choose “Other, specify” and enter a description. Be as brief as possible. Only select “Other, specify” if the comment does not fit into one of the listed comments.

Exhibit 4-7. Screen for partial or not done exams



4.5 Procedures for Conducting TGMD-2 Gold Standard Exams

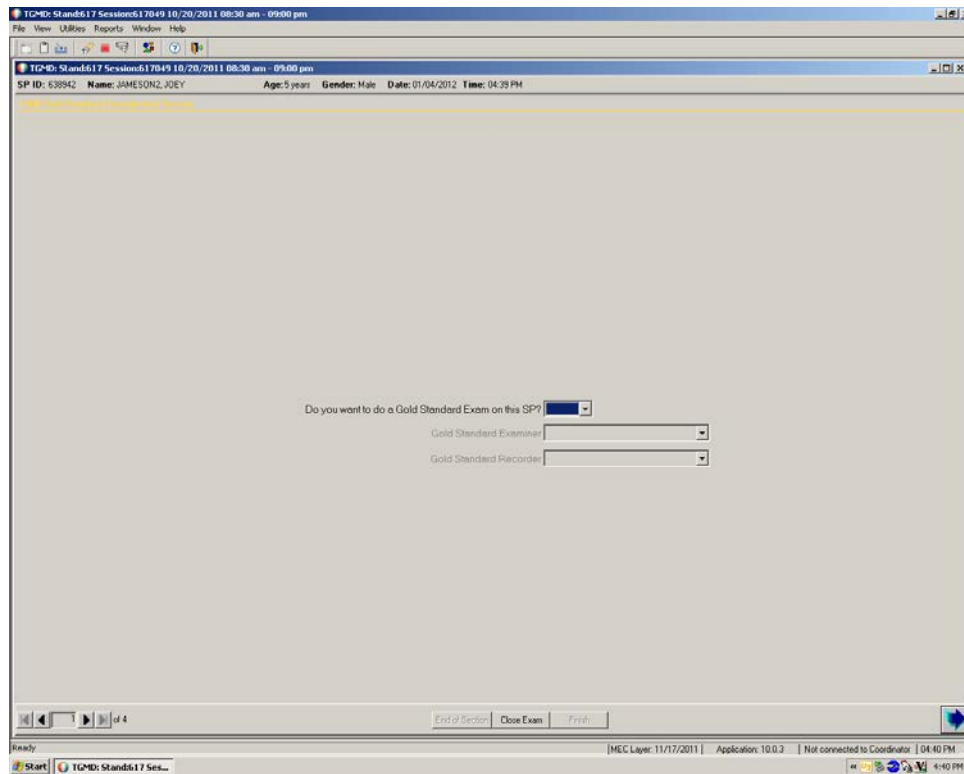
The TGMD-2 consultant and the TGMD examiner will score the same performance by the SP. The examiner will conduct the exam and enter the data into ISIS while the consultant records his observations on a hard-copy form. Immediately following the exam, one of the other exam team members will enter the consultant's answers into the Gold Standard application.

Before selecting the session during which Gold Standard exams will be conducted, activate the Gold Standard software application.

- In the ISIS TGMD-2 application under the Utilities menu, go to “Gold Standard.”
- Click on “Gold Standard” so that a checkmark appears beside it, indicating the application is on.
- If rebooting the computer is necessary during a session, the Gold Standard application must be reactivated.

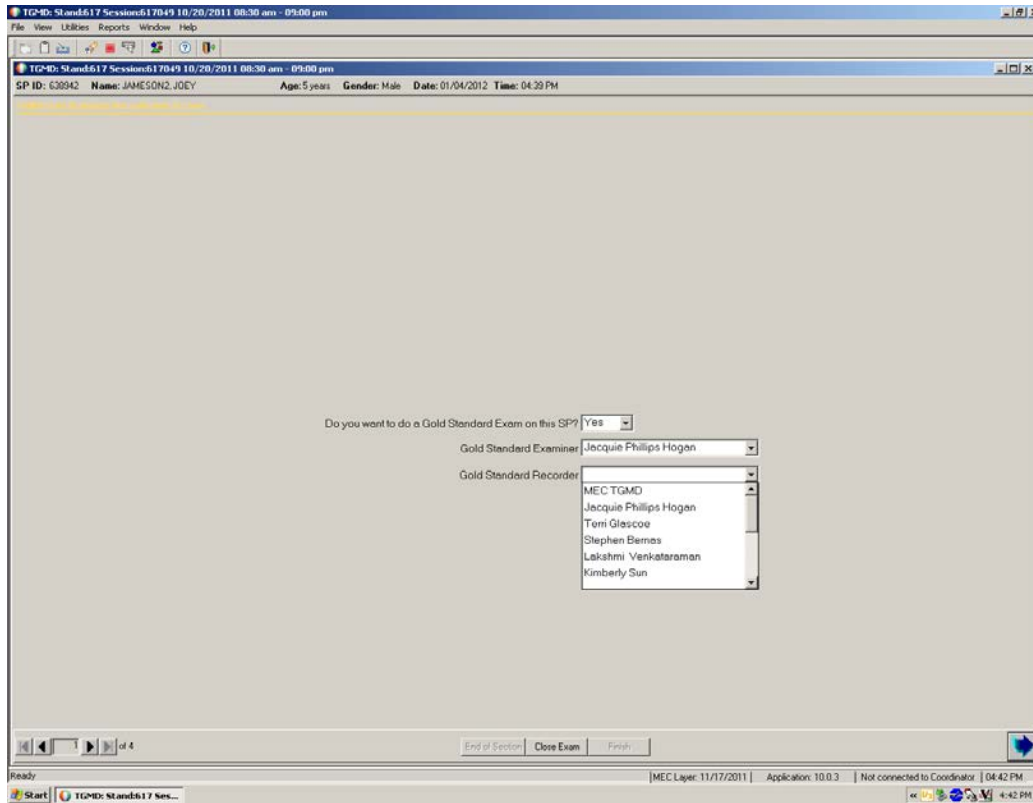
To use the Gold Standard application, the examiner should conduct the exam as usual. After finishing the exam, be sure to continue clicking the large blue arrow in the lower right corner of the screen. The Gold Standard screen will appear with the question: “Do you want to conduct a Gold Standard Exam on this SP”? See Exhibit 4-8.

Exhibit 4-8. Initial Gold Standard screen



If “Yes” is answered, a drop-down box will appear from which the appropriate name under the Gold Standard Examiner and Gold Standard Recorder should be selected (Exhibit 4-9).

Exhibit 4-9. Selecting names for Gold Standard



Click the blue arrow to proceed to the first screen, which is identical to the primary exam screen, showing the skill tabs and the performance criteria for the Run. Enter the scores into the appropriate blanks for all of the skills, click the blue arrow again, and then click “Finish” to end the exam.

4.6 Comparing the Exam Results

The ISIS TGMD-2 application is designed with the capability to compare the results of the Gold Standard examination to the results recorded by the staff examiner. This allows the Gold Standard examiner and the MC staff to review and discuss on the spot discrepancies in how they scored the performance criteria. Gold Standard comparison reports can be generated from ISIS in two ways.

1. ISIS TGMD-2 application: In the main menu bar, under the tab entitled “reports,” select “Gold Standard.” Then choose the desired results by Stand, Session, and/or SP(s).
2. ISIS IntraWeb: Select MC Operations, Operations Reports, TGMD-2 Gold Standard Report. Then choose the desired results by Stand, Session, and/SP(s).

The Gold Standard Reports include the results obtained for individual SPs as well as a display of the absolute and percent difference between the values obtained by the Gold Standard examiner compared to the staff technologist. The major difference between generating the report from the application vs. the IntraWeb is that the IntraWeb report additionally offers a cumulative summary of the number of Gold Standard examinations performed for each examiner.

5. REFERENCES

1. Williams, H.G., Pfeiffer, K.A., O'Neill, J.R., Dowda, M., McIver, K.L., Brown, W.H., and Pate, R.R. Motor skill performance and physical activity in preschool children. *Obesity (Silver Spring)*. 2008;16:1421-6.
2. Sun, S.H., Sun, H.L., Zhu, Y.C., Huang, L.C., and Hsieh, Y.L.. Concurrent validity of Preschooler Gross Motor Quality Scale with Test of Gross Motor Development-2. *Res Dev Disabil*. 2011. [Epub ahead of print]
3. Cepicka, L. Normative data for the Test of Gross Motor Development-2 in 7-yr.-old children in the Czech Republic. *Percept Mot Skills*. 2010;110:1048-52.
4. Hartman, E., Houwen, S., Scherder, E., and Visscher, C. On the relationship between motor performance and executive functioning in children with intellectual disabilities. *J Intellect Disabil Res*. 2010;54:468-77.
5. Houwen, S., Hartman, E., Jonker, L., and Visscher, C. Reliability and validity of the TGMD-2 in primary-school-age children with visual impairments. *Adapt Phys Activ Q*. 2010;27:143-59.
6. Pang, A.W., and Fong, D.T. Fundamental motor skill proficiency of Hong Kong children aged 6-9 years. *Res Sports Med*. 2009;17:125-44.
7. Staples, K.L., and Reid, G. Fundamental movement skills and autism spectrum disorders. *J Autism Dev Disord*. 2010;40:209-17.
8. Simons, J., Daly, D., Theodorou, F., Caron, C., Simons, J., and Andoniadou, E. Validity and reliability of the TGMD-2 in 7-10-year-old Flemish children with intellectual disability. *Adapt Phys Activ Q*. 2008;25:71-82.
9. Niemeijer, A.S., Smits-Engelsman, B.C., and Schoemaker, M.M. Neuromotor task training for children with developmental coordination disorder: a controlled trial. *Dev Med Child Neurol*. 2007;49:406-11.