PDI Check Vision Screening Game for Nintendo 3DS

***PDI Check** is an interactive multiple-choice game utilizing the unique color, 3-dimensional screen on the Nintendo 3DS system to quickly and accurately measure monocular near visual acuity, color vision and stereopsis.*

As a part of a comprehensive eye exam, visual functions are measured at distance and near. The main near visual functions are visual acuity, color vision and stereopsis.

Near visual acuity is measured with optotype charts or cards with the non tested eye covered with an eye patch or (less ideal) an occluder.
Color vision can be measured with test books (Ishihara or HRR) or by comparison tests like Farnsworth-Munsel D-15 or F-M D-100 test, the Anomaloscope or the Innova RCC test.
Stereo can be measured using Polarized Test booklets like Stereo Optical Fly, Stereo Optical Reindeer or Random Dot stereo booklets all of which require stereo goggles to confer depth. Depth can also be observed using re-green goggles as with 3D movies. The Frisby stereo test does not require goggles.

If repeat testing is required, most Acuity, Color and Stereo tests can be memorized. The Randot tests are better than the offset-image tests if the patient attempts to cheat by removing the goggles.
The PDI Check game presents in a dynamic and randomized manner making it much more difficult to cheat by memorizing or adjusting the goggles, or peaking under an occluder.

Some children are averse to wearing goggles or having a patch placed over and eye; PDI Check overcomes this by not requiring something close to the eyes / face to assure monocular acuity and binocular 3D images.

The PDI Check game (v 0.1.0) has an orientation phase and a testing phase. During the orientation phase, the patient initially views the top, 3D screen and sees four identical objects in each quadrant. Then they press the "START" button. When one random object becomes markedly different, the patient is to signal their choice by pressing- either with finger or stylus- the corresponding quadrant of the lower, touch sensitive screen. (Ideally the upper screen would have both functions- 3D presentation and touch input- but that is not currently available on the Nintendo system- yet)

In the orientation phase, coarse levels of stereo, color and acuity are abruptly presented and a lag-time from patient visualize to patient press-signal is recorded for each of acuity, color and stereo.
During the subsequent testing phase, fine levels of stereo (minimal offset of circles), color (equal hue at deuteranopia-confusion axes) and acuity (small letter C) are initially viewed with gradually coarser levels of disparity in one randomized quadrant. For stereo, the circles from right and left eyes are separated by increasing disparity. For color, one random colored disc is gradually changed to a different hue. For the acuity, one random quadrant C in just one eye is switched to a U- and then all quadrants - the three remaining C and the one with a rivalry C and U gradually increase in size. The patient is to press the corresponding lower screen quadrant as soon as they perceive a different of four objects on the dynamically changing upper screen.
A Result- score of each visual function is determined by subtracting the lag time from the orientation phase from the elapsed time in the testing phase.
A normal patient can complete the orientation and three testing phases in about 90 seconds.
The time to take Rosenbaum Pocket acuity patched, Stereo Optical Fly with polarized goggles and Ishihara Precise color book is about 113 ± 25 seconds.
2018 Price: The PDI Check game will sell on the Nintendo Market Place for $99.

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	Conventional	Specialty	PDI Check
Visual acuity			version 0.1.0
monocularly	patch (-occluder)	patch (-occluder)	parallax barrier screen
optotypes	Sloan- Rosenbaum $6.90	Tumbling E, **Landholt C**	U C (Landholt C modified)
child optotypes	Allen,	LEA, HOTV match	dynamic
Cost	$6.90		$99
nystagmus	binocular	binocular, fog	parallax barrier screen
memorizable?	memorize	memorize	random
Color			
Types:	**Ishihara ($129-$242)**		deuteronopia game
	AAO HRR ($219)		randomized
		F-M D15 ($245)	
		FM D-100 ($721)	
		Rabin's Innova RCC ($5000)	dynamic
		Anomaloscope	
memorizable?	memorize	usually not memorize	random
Cost	$129		$99
Stereo			
Types:	**Stereo fly $180 -$529**		dynamic random circles
	Stereo reindeer		
	Randot ($180)	Randot Preschool ($362)	
		Frisby (no goggles) ($586)	
binocular split?	polarized goggles ($74)	polarized goggles ($22-$74)	auto stereoscopic screen
memorizable?	memorize	memorize	random
Cost	$180		$99
Total Cost	$315.9 - $664.9		$99

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PDICheck.com

Vision: Easy, Fun, Quick

Accurate Brilliant Clear Deep