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# **In Office Vision Therapy Manual of Procedures**

## **ATS-VT**

### **May 15, 2008**

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## **In-Office Vision Therapy Therapist Guidelines**

### **70 Qualifications/Certification of Vision Therapists**

71

72 • Candidates for certification as a study VT therapist will be required to be an  
73 optometrist, ophthalmologist, orthoptist, occupational therapist or vision therapist  
74 (definition of vision therapist is an individual who has 6 months experience with  
75 vision therapy). Candidates without these qualifications will be considered by the  
76 study Steering Committee on a case-by-case basis.

77

78 • Candidates will be sent the manuals of procedures, a training video, and  
79 equipment needed to perform the therapy. They will be expected to study these  
80 materials, practice performing both the active and control therapy, and to pass a  
81 written test.

82

83 • Candidates passing the written test must attend a 2-day intensive training session.  
84 At the end of the training session, each candidate will be required to demonstrate  
85 competence performing 5 to 6 randomly-selected activities from either treatment  
86 group.

87

88 • Candidates will have to submit treatment progress reports for 2 test patients after  
89 attending the training session before they can be fully certified.

90

91 • Candidates passing the practicum who have at least 60 hours of experience  
92 performing VT in a patient setting within the past year and have sent in the 2  
93 reports form test patients will be fully certified. Other candidates passing the  
94 practicum will be provisionally certified.

95

96 Provisionally-certified candidates will be site visited after their site has enrolled 1 to 3  
97 patients to be observed administering therapy to study patients. Full certification will be  
98 granted if the therapist demonstrates competence in administration of the study  
99 treatments.

100

101

### **102 General In-Office Protocol:**

103 Patients receiving therapy will have weekly, 60 minute visits with an individual therapist  
104 for 16 weeks, 15 minutes visual acuity measurement and home therapy review and 45  
105 minutes of active vision therapy. The visit with the therapist must occur every 7 days  
106 ( $\pm 4$  days). On the days between visits, the patient will perform 2 hours of daily  
107 patching. During this time the patient will have 30 minutes of assigned home vision  
108 therapy (assigned by the therapist) and 30 minutes of near activities. On the days of in-  
109 office therapy, the patient will perform one additional hour of patching at home but will  
110 not perform the 30 minutes of home vision therapy or the 30 minutes of near activities.  
111 Each patient will be asked to keep a homework log to record the amount of time the  
112 patient wore the patch at home as well which activities were performed. The patient

113 should bring the homework log to each weekly office visit for the therapist to review. A  
114 copy of the homework log will be forwarded to JAEB.  
115

### 116 **General Sequencing of Procedures:**

117 The procedures for in-office vision therapy are described in detail in this chapter. The  
118 therapy is divided into three phases. Each phase will require approximately 5 weeks to  
119 complete (although this may vary slightly for each patient). The procedures are  
120 sequenced from easiest to hardest as the patient moves from one phase to the next.  
121 Therapy from phase one must precede therapy from phase two which must precede  
122 therapy from phase three (See Therapy Flowchart). Each procedure has a designated  
123 endpoint that should be attained before moving on to the next level or phase (See  
124 Therapy Endpoint Summary).  
125

### 126 **Choosing Activities for Each In-Office Therapy Visit:**

127 Within each phase, the activities are divided into one of three categories;  
128 Accommodation (focusing skills), Vergences (eye teaming skills), and Suppression  
129 (ignoring an eye). The activities for each category within each phase have roughly  
130 similar levels of difficulty. At each in-office therapy visit, the therapist must perform 4-5  
131 activities with the patient. The therapist must choose one activity from each of the  
132 three categories (accommodation, vergence, and suppression) within the patient's  
133 current phase of therapy. The therapist may also choose 1-2 additional activities from  
134 within the same phase. (The total therapy time should still always remain 45 minutes.)  
135 From visit to visit, the activities chosen from each category of the phase should vary to  
136 encourage patient compliance as well as to emphasize skills that are developing more  
137 slowly. It should be the therapist's goal to meet the endpoints of all the activities within  
138 a phase within 5-6 weeks. Once a patient has mastered an activity, it does not have to  
139 be revisited but may be in the interest of providing variety for the patient. If a patient  
140 has met the endpoint for a skill within his phase, the activity may be repeated at  
141 subsequent visits maintaining the highest level dictated by that phase of therapy.  
142

143 The patient may move from one phase to the next when all the endpoints for the  
144 previous phase have been met. Some flexibility with these endpoints may be required  
145 for some patients. If a patient has spent 7 weeks within one phase and is struggling to  
146 attain the required endpoints to move to the next phase, the protocol chair should be  
147 consulted to determine if the patient may move forward or should be maintained in that  
148 phase.  
149

150

### 151 **General Therapy Principles**

- 152 1. **Always use positive reinforcement:** The patient should always be  
153 verbally rewarded for a good effort. Even if the patient is unsuccessful at  
154 the required skill, the therapist should encourage the patient and  
155 commend their hard work.

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2. **Always ask the patient how their eyes feel and what they are doing:** The therapist should try to establish an awareness on the part of the patient of what they are doing to make the targets clear, single, and visible. The patient should take an active part in the therapy and understand that they are causing the targets to become clear and single (not the therapist).
  - a. When performing accommodative activities, the patient should be asked if they can feel their eyes tightening with minus lenses and relaxing with plus lenses. They should also be asked what it is they are doing with their eyes to make the target clear.
  - b. When performing vergence activities, the patient should be asked if they can feel their eyes tightening with convergence and relaxing with divergence. They should also be asked what they are doing to make the target single.
  - c. When performing suppression activities, the patient should be asked if they can feel what their eye is doing when the target disappears and/or reappears. They should also be asked what it is they are doing with their eye to make the target reappear.
3. **Build stamina at each level before proceeding to the next:** The therapist should make sure the patient is proficient at each level before moving to the next. If the patient is moved to quickly, the patient may be easily overwhelmed and frustrated.
4. **The patient should always wear his or her habitual Rx during therapy.** If the activity requires the use of red and green glasses or polarized glasses, these should be worn over the patient's habitual Rx. If the patient presents to therapy without his Rx, the therapist should make the child's Rx in a trial frame for therapy.

## **In-Office Vision Therapy Procedures for ATS-VT**

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### **Accommodative Therapy**

- Accommodative Push-ups (phase 1)
- Loose Lens Bi-ocular Facility (phase 1 & 2)
- Letter Chart Accommodative Facility (phase 1 & 2)
- Binocular Accommodative Facility with word search (phase 3)
- Binocular Accommodative Facility with word rock cards (phase 3)

### **Anti-Suppression**

- Physiological Diplopia Awareness (Brock String) (phase 1)
- Anaglyphic Drawing: Red line coloring book (phase 1)
- Face Form (phase 1 & 2)
- Line Tracing (phase 1 & 2)
- Anaglyphic Drawing: Red Crayon Activities (phase 1)
- Bar Reader (phase 2)
- Computer Anti-suppression (phase 2)
- Anaglyphic Letter Tracking (phase 2 & 3)
- Number Find (phase 3)
- String Reading (phase 3)
- Vis-à-vis (phase 3)

### **Vergence**

- Barrel Cards (phase 1)
- Vectogram SILO/Localization-Range extension (phase 1)
- Computer Vergences (phase 1)
- Brock String with Prism (phase 2)
- Vectogram Ranges and Recoveries (phase 2)
- Mini-Tranaglyph Ranges and Recoveries (phase 2 & 3)
- Computer Jump Ductions (phase 2)
- Eccentric Circles (phase 3)
- Vectogram Jumps (phase 3)
- Aperture Rule (phase 3)

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**Sequence for In-Office Vision Therapy for Office Based Vision Therapy Group**

Treatment Category	Phase 1	Phase 2	Phase 3
Accommodation	Letter Chart Accommodative Facility	Letter Chart Accommodative Facility	Binocular Accommodative Facility with word search $\pm 2.50$
	Loose Lens Bi-ocular Facility -4.00	Loose Lens Bi-ocular Facility-6.50	Binocular Accommodative Facility with word rock cards $\pm 2.50$
	Accommodative Push-ups		
Suppression	Physiological Diplopia Awareness (Brock String)	Bar Reader	Vis-à-vis
	Red Crayon Activities	Anaglyphic Letter Tracking	Anaglyphic Letter Tracking
	Red Line Coloring Book		Number Find
	Face Form 1	Face Form 2	String Reading
	Line Tracing 1	Line Tracing 2	
Vergences	Barrel Card	Brock String with Prism (15 BI and 25 BO)	Eccentric Circles
	Vectogram—SILO/Localization	Vectogram—Ranges and Recoveries (L and 30)	Vectogram Jumps (L and 30)
	Computer Vergences (15 BI and 25 BO)	Computer Jump Ductions (15 BI and 25 BO)	Aperture Rule (Card 8 BO and Card 4 BI)
		Mini-Tranaglyph—Ranges and recoveries (12 BO and 8 BI)	Mini-Tranaglyph—Ranges and recoveries (25 BO and 15 BI)

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**In Office Vision Therapy Endpoint Summary**

Phase One	
Accommodation	Endpoint
▪ Letter Chart Accommodative Facility	Alternately clear the near chart held at 6-7 cm

	and the distance chart at VA appropriate distance at 12 cpm
▪ Loose Lens Bi-Ocular Facility	Quickly alternate between the charts with -4.00D in front of the amblyopic eye
▪ Accommodative Push-up	Maintain clear image with target held at 6-7 cm monocularly
<b>Suppression</b>	<b>Endpoint</b>
▪ Brock String	Accurate fixation on each bead with <10% suppression and diplopia awareness
▪ Red Crayon Activities	Participation in crayon activity with <10% suppression
▪ Red Line Coloring Book	Accurate tracing of red targets with <10% suppression
▪ Face Form 1	Complete form accurately in approximately one minute with with <10% suppression
▪ Line Tracing 1	Completion of forms with <10% suppression
<b>Vergences</b>	<b>Endpoint</b>
▪ Barrel Card	Maintain fusion for 10 seconds on the two farthest beads without suppression
▪ Vectogram Vergences	Appreciation of SILO and localization without suppression from C to 3
▪ Computer Vergences	Smooth vergences to 15BI and 25BO
<b>Phase Two</b>	
<b>Accommodation</b>	<b>Endpoint</b>
▪ Letter Chart Accommodative Facility	Clear the near chart held at 6-7 cm and quickly clear the distance chart at 10-15 feet
▪ Loose Lens Bi-Ocular Facility	Quickly alternate between the charts with -6.50 in front of the amblyopic eye
<b>Suppression</b>	<b>Endpoint</b>
▪ Bar Reader	Smooth reading with <10% suppression
▪ Anaglyphic Letter Tracking	Accurate tracking with <10% suppression with 2 and 3 paragraph pages
▪ Face Form 2	Complete form accurately in approximately one minute with <10% suppression
▪ Line Tracing 2	Completion of forms with <10% suppression
<b>Vergences</b>	<b>Endpoint</b>
▪ Brock String with Prism	Accurate fusion of 15BI and 25BO without suppression at 30-40cm
▪ Vectogram Vergences ranges and recoveries	Smooth vergences and recovery of fusion to L and 30
▪ Mini-Tranaglyphs ranges and recoveries	Smooth vergences and recoveries up to 12BO and 8BI
▪ Computer Jump Ductions	Jumps between 15BI and 25BO
<b>Phase 3</b>	
<b>Accommodation</b>	<b>Endpoint</b>
▪ Binocular Accommodative Facility with word search	12 cycles/minute with +/-2.50 flipper with suppression <10% of the time
▪ Binocular Accommodative Facility with word rock cards	12 cycles/minute with +/-2.50 flipper with suppression <10% of the time.

<b>Suppression</b>	<b>Endpoint</b>
<ul style="list-style-type: none"> <li>▪ Vis-à-vis</li> </ul>	Reduction of suppression to less than 10% from 2 to 10 feet
<ul style="list-style-type: none"> <li>▪ Anaglyphic Letter Tracking</li> </ul>	Accurate tracking with <10% suppression with 4 and 6 paragraph pages
<ul style="list-style-type: none"> <li>▪ Number Find</li> </ul>	Accurately locate numbers 1-100 with <10% suppression
<ul style="list-style-type: none"> <li>▪ String Reading</li> </ul>	Smooth and proficient performance on level 3 with <10% suppression
<b>Vergences</b>	<b>Endpoint</b>
<ul style="list-style-type: none"> <li>▪ Eccentric Circles</li> </ul>	Fusion with cards edge to edge for divergence and separated 3-5 cm for convergence.
<ul style="list-style-type: none"> <li>▪ Vectogram Jumps</li> </ul>	Jump vergences from L to 30
<ul style="list-style-type: none"> <li>▪ Mini-Tranaglyphs ranges and recoveries</li> </ul>	Smooth vergences and recoveries up to 25BO and 15BI
<ul style="list-style-type: none"> <li>▪ Aperture Rule</li> </ul>	Card 8 with convergence and card 4 for divergence without suppression and accurate accommodation (clear)

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## Home Therapy for Office Based Vision Therapy Group

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Patients are expected to perform 30 minutes of vision therapy at home each day between office visits. The patient should be assigned the appropriate computer program after each week's session (detailed below). The determination of programs will be dependent upon patient's responses during the weekly vision therapy session. The two computer programs which will be utilized are the Amblyopia iNet Program and the Home Therapy System. The home vision therapy is designed to further improve the patients' visual acuity, eye-movements, their vergence ranges and fusional capabilities.

Each site will receive a copy of the patient and doctor discs for each program and a doctor's manual, which details the operation of each program. The patient discs will be used to train the therapist on what the patient will experience at home. The doctor discs will allow the therapist/investigator demonstrate the program to each patient, review the patient's performance each week and modify the home therapy based on their performance during the weekly office therapy, if indicated.

The therapist will be responsible for giving the patient a copy of each program, demonstrating how the patient interacts with the programs and setting up the initial information needed to monitor the activities. Set-up and implementation of the computer based therapy can be found in the doctor's manual for each program.

## Sequence for Home Therapy for Office Based Vision Therapy Group

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	Amblyopia iNet Program	Home Therapy System
Phase 1		
	Monocular Activities	
Phase 2		
	Monocular in a Binocular Field Activities	Base-In Vergence Base-Out Vergence
Phase 3		
	Monocular in a Binocular Field Activities	Jump Ductions Auto Slide Vergence

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1. Amblyopia iNet Program includes the following activities:
  - Follow the Letter
  - Concentration
  - Laser Ball
  - Penguin Peek
  - Letter Jump
  - Space Ball
  - Butterfly Hunt
  - Chipmunk Chase
  - Find the Target

- 271 • Capture the Target
- 272 • Traffic Jam
- 273 • Skiing

274

275 The patient will complete 6 of the activities each day for a set amount of  
276 time, depending on the phase and the activities which are also performed  
277 with the Home Therapy System. Initially the target size will correspond to  
278 2 lines above the patient's visual acuity. Target size will decrease as the  
279 patient reaches the goal for each activity (goal is 80-100% accuracy on  
280 each target size).

281

282 The patient will move from Phase 1 to Phase 2 in the Amblyopia iNet  
283 Program after they successfully complete Phase 1 of the Anti-suppression  
284 category in-office. Movement to Phase 3 will occur automatically within  
285 the program. Target size will continue to change automatically based on  
286 patient performance.

287

288 2. Home Therapy System includes the following activities:

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### 301 **Prescribing iNET Home Therapy Program**

302 At the end of the first in-office therapy session the therapist will introduce the  
303 home therapy program, iNET, to the patient using the demonstration mode of  
304 the programs. Once the patient understands what to expect at home the  
305 following steps will be required to be completed before the patient leaves the  
306 office:

307

308 Therapist list for prescribing iNET

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1. Indicate beginning acuity and amblyopic eye on the back of the iNET box. Beginning acuity is defined as the acuity that was recorded from EVA testing the day of the first in-office session. Patient will need to input this information when they install the programs on their computer in order to for the targets to start at the appropriate size. Home Therapy Systems

314 has already set-up the program; the therapist will not have to input any  
315 patient data for the program in the office. Simply give the program to the  
316 parent and instruct them to install it at home using the instructions  
317 provided.

318

319 2. Give the patient the programs and materials to take with them. These  
320 materials include

321 a. Amblyopia iNet Program

322 i. Program CD

323 ii. Instructions for setting up program

324 iii. Measuring tape

325 iv. Patch

326 v. Data disc (for patient to upload progress if they do not have  
327 internet access)

328

329 b. Instruction sheet indicating activities and duration of time for each.

330 i. This is to ensure that the program is set according to the  
331 therapist's instructions. Every patient will start with the phase 1  
332 activities (monocular activities for iNet).

333 ii. If the patient notices any deviation from the prescribed  
334 treatment, the patient must call the therapist to verify the  
335 program. The therapist can make changes or contact HTS for  
336 them to modify the program.

337 iii. Therapist should verify set-up by logging into patient account 1-  
338 2 days after initial visit.

339

### 340 **Prescribing the HTS Program**

341 At the In-Office session where the patient reaches goal outlined in the Anti-  
342 suppression category, the vision therapist will prescribe the HTS program for  
343 home use. This program will have the patients perform activities each day based  
344 on the phase the patient is in. Each program is initially set-up for the patient to  
345 perform Base-In and Base-Out Vergences. Once they reach the goals for these  
346 activities the program will automatically switch to the Autoslide Vergences, and  
347 then finally the Jump Ductions. The therapist will monitor the patient results  
348 using the tools program on the vision therapy computer.

349

350 Therapist list for prescribing HTS

351 • Give the patient the program and materials to take with them.

352 These materials include

353 ○ HTS Program CD

354 ○ Instructions for setting up program

355 • Therapist needs to log into the patient's iNet program and decrease  
356 each activity by one minute (4 minutes instead of 5 minutes). The  
357 therapist may contact Rod Bortell at Home Therapy Systems

358 directly if there is any question about changing the time limits on  
359 the activities.  
360

### 361 **Reviewing/Modifying Home Therapy Activities at Follow-up visits:**

#### 362 Review of Activities:

363

364 At each follow-up visit the therapist needs to log onto the patient account and  
365 verify they are performing the activities assigned to them and record verification  
366 on the on-line study forms. Home therapy should not be modified (changed from  
367 Phase 1 to Phase 2) until the following condition is met:

368

- 369 • Modification should not be made until the patient has  
370 performed in-office Phase 2 anti-suppression activities in  
371 office. (e.g. patient reaches goals of Phase 1 anti-  
372 suppression during week 4 and is being moved to Phase 2  
373 during week 5. After the week 5 visit therapist will modify  
374 the programs)

375

#### 376 Modification of Programs:

377

378 When patient is ready to move to Phase 2 in Amblyopia iNet Program and Home  
379 Therapy system the following modifications will be made by the therapist:

380

#### 381 Amblyopia iNet Program:

382

- 383 1. Change program from monocular to Monocular in a Binocular Field  
384 i. Therapist will give patient red/blue glasses with the blue lens  
385 over the amblyopic eye

386

#### 387 Home Therapy System:

388

- 389 1. No change is needed by the therapist. The program will automatically  
390 change from Phase 2 to Phase 3 based on the patient's responses.

391

### 392 **Instructions to patients for updating and saving data**

393

394 Each patient will be instructed to save their daily progress.

395

- 396 • For internet users this is done automatically with broadband  
397 connection and every time they connect with dial-up. The therapist  
398 will be able to review the data in the office.

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- For patients without an internet connection they will need to backup their progress every other day to a floppy disc, thumb-drive or CD and bring that into the office for the therapist to review with them.

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### In-Office and Home Vision Therapy Flow Chart

Phase 1 (approximately weeks 1-5)			
<b>In Office</b>	<b>Accommodation</b>	<b>Suppression</b>	<b>Vergence</b>
	Letter Chart Accommodative Facility	Brock String	Barrel Card
	Bi-ocular facility	Red Crayon activities	Vectograms
	Acccom push-up	Red line coloring book	Computer vergences
		Face Form 1	
	Line tracing 1		
<b>Home</b>			
	<b>iNet</b>		Transition to phase 2 requires modification of patient program by therapist
	Monocular Activities		

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Phase 2 (approximately weeks 6-10)			
<b>In Office</b>	<b>Accommodation</b>	<b>Suppression</b>	<b>Vergence</b>
	Letter Chart Accommodative Facility	Bar Reader	Brock string with prim
	Bi-ocular facility	Anaglyphic letter tracking	Vectograms
			Computer Jumps
		Face Form 2	Mini-tranaglyph
	Line tracing 2		
<b>Home</b>			
	<b>iNet</b>	<b>HTS</b>	Transition to phase 3 occurs automatically without program modification
	Monocular in a Binocular Field	Base-In Vergence Base-Out Vergence	

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Phase 3 (approximately weeks 11-16)			
<b>In Office</b>	<b>Accommodation</b>	<b>Suppression</b>	<b>Vergence</b>
	Binocular facility with word search	Vis-à-vis	Eccentric Circles
	Binocular facility with word rock card	Anaglyphic letter tracking	Vectograms
		Number Find	Aperture Rule
		String Reading	Mini-tranaglyph
<b>Home</b>			
	<b>iNet</b>	<b>HTS</b>	
	Monocular in a Binocular Field	Jump Ductions Auto Slide Vergence	

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## Accommodative Vision Therapy

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### 415 **Accommodative Push-Ups**

416 Accommodation Therapy Phase 1

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#### 418 Purpose:

419 To normalize and equalize accommodative amplitudes

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#### 421 Equipment:

422 1. Eye patch

423 2. Small Letter Chart (optotypes=3mm tall)

424

#### 425 Procedure:

426 1. Use adequate lighting and proper spectacle correction

427 2. This activity should be first demonstrated with the amblyopic eye patched

428 3. The small Letter Chart should initially be held at 40cm and at eye level. The  
429 patient should be asked to read the letters consecutively as the chart is slowly  
430 brought toward the eye. To keep the letters clear, the patient must be coached  
431 to "look hard" and "close".

432 4. Move the Letter Chart in slowly until the letters slightly blur. Hold for several  
433 seconds to see if the patient can clear the letters with coaching. If the patient  
434 can clear the letters, he should continue to move the chart closer to his eye  
435 trying to keep the letters clear. If the patient can no longer clear the target, the  
436 patient should move target to arms length and repeat.

437 5. Repeat process for approximately 1-2 minutes and then perform the activity with  
438 the non-amblyopic eye patched.

439 6. The procedure should be repeated with the amblyopic eye 4-5 minutes.

440

#### 441 Coaching:

442 When the target just begins to blur, the patient should be coached to "look  
443 hard", "tighten the eyes", or "think about looking close." The therapist should  
444 coach the patient to regain clarity if possible without having the move the chart  
445 back.

446

#### 447 Goal:

448 Normalization of accommodative amplitudes for both eyes. The patient should  
449 be able to keep the small chart clear at a distance of 6-7 cm in front of the  
450 amblyopic eye.

451

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453

## 454 **Letter Chart Accommodative Facility**

### 455 Accommodative Therapy Phases 1 & 2

#### 456 Purpose

457 Restore normal monocular accommodative facility

#### 458 Equipment

- 459 1. Large Letter Chart (Optotypes=1cm tall)
- 460 2. Small Letter Chart (Optotypes=3mm tall)
- 461 3. Eye patch to place over the patient's non-amblyopic eye

#### 462 Procedure

- 463 1. The Large Letter Chart should be positioned at eye level and the patient should  
464 be asked to walk backwards away from the chart until the letters can barely be  
465 seen with the amblyopic eye. Approximate VA specific expectations are listed  
466 below:
  - 467 a.  $VA \geq 20/80$  and/or  $\leq 20/100$ —4 to 5 feet
  - 468 b.  $VA \geq 20/60$  and  $< 20/80$ —5 to 7 feet
  - 469 c.  $VA \geq 20/40$  and  $< 20/60$ —7 to 10 feet
  - 470 d.  $VA \geq 20/20$  and  $< 20/40$ —10 to 15 feet
- 471 2. The therapist may pick either chart 1, 2, or 3 to give the patient variety and to  
472 discourage memorization of the chart. The large and small charts should match.
- 473 3. The non-amblyopic eye should be patched
- 474 4. Ask the patient to hold the small chart at 40cm and call off the letters on the top  
475 line as he or she slowly moves the chart closer.
- 476 3. When he or she can no longer keep it clear have him move the chart 2.5cm  
477 further away and maintain the near chart at this distance.
- 478 4. The patient is then asked to read the first 5 letters on the first line of the near  
479 chart. Then the patient is asked to look at the distance chart and read the next  
480 5 letters. This cycle should be repeated for each line on the chart.
- 481 5. As the patient's speed and proficiency improves, he should be encouraged to  
482 hold the small chart closer (as close as possible) and move further away from  
483 the distance chart.

484

#### 485 Coaching

486 If the patient is experiencing difficulty clearing the chart, suggest that patient  
487 try and get the "feeling" of looking close and crossing his or her eyes for the  
488 small chart or have the patient try and get the feeling of relaxing or staring for  
489 the large chart.

#### 490 Goal

491

#### 492 Phase 1:

- 493 • Successfully clear the near chart held at 6-7 cm.
- 494 • Clear the distance chart from VA appropriate distance

#### 495 Phase 2:

- 496 • Successfully clear the near chart held at 6-7 cm and the distance chart  
497 from 10-15 feet away at a speed of 12 cycles per minute

498

## Loose Lens Bi-Ocular Facility

### **Purpose:**

To improve and equalize accommodative facility

### **Equipment:**

1. Large Letter Chart
2. Loose minus trial lenses (-2.00 to -6.50)
3. Vertical dissociating trial prism (8-10 $\Delta$ )

### **Procedure:**

1. The patient should stand 2-3 feet from the large Letter Chart (placed at eye level in front of the patient).
2. The patient should initially hold a minus lens with an 8-10 $\Delta$  base down prism approximately 3-4cm before the non-amblyopic eye. The initial lens power should be -2.00 or -3.00. This will cause the patient to see two charts. The higher chart will be seen through the minus lens and will require active accommodation to clear. The bottom chart will be seen without any lenses and will require relaxed accommodation to clear it.
3. The patient is asked to look into the lens and clear the Letter Chart that appears smaller and higher within it. The patient will have to accommodate to clear this target. The patient is instructed to read 2-3 letters from the chart. As the patient accommodates with the non-amblyopic eye, the therapist may observe that the amblyopic eye without the lens will cross slightly (this is due to the natural interaction between accommodation and convergence).
4. Next, the patient is instructed to look with the amblyopic eye (the one with no lens) and read the next 2-3 consecutive letters.
5. The patient continues through the chart until she is able to proficiently switch fixation between the two eyes. As proficiency improves, the minus lens powers should be increased in 0.50 D steps.  
Note: The patient should be able to comfortably and easily alternate between the two eyes for 3-4 minutes before increasing the lens power. It is important to build speed AND stamina with this activity.
6. Once the patient understands how to visualize and clear the small chart through the lens with the lens before the non-amblyopic eye, the lens should be placed in front of the amblyopic eye and the procedure repeated.
7. At each therapy visit that this activity is performed, the patient should initially hold the lens and prism before the non-amblyopic eye and practice for 1-2 minutes. The remaining (and majority) of the time should be spent with the lens before the amblyopic eye.

### **Coaching:**

1. If the patient has difficulty finding the "small" chart in the lens, it is sometimes helpful to momentarily occlude the eye without the lens. It is also sometimes helpful to wiggle the minus lens slightly and have the patient look for the chart that's moving.

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2. It is important to ask the patient throughout the activity questions to establish awareness of his focusing..."do your eyes tighten or relax when looking through the lens?", "is the print smaller or larger through the lens?". The patient should be an active participant in the clearing of each lens.
  3. If the patient is having difficulty clearing the chart seen by the minus lens, the patient should be coached to "look hard" and "think about looking up close".
  4. The accommodative demand may be decreased by moving the minus lens away from the eye and increased by moving the lens closer.

556 **Goal:**

- 557 Phase 1: Quickly alternate fixation between the two eyes with a -4.00D lens before the  
558 amblyopic eye.  
559 Phase 2: Quickly alternate fixation between the two eyes with a -6.50D lens before the  
560 amblyopic eye.

561 **Binocular Accommodative Facility with Word Search**

562  
563 Accommodative Therapy Phase 3

564  
565 Purpose:

566 To develop binocular accommodative skills without suppression

567  
568 Equipment:

- 569 1. Binocular accommodative flippers ( $\pm 1.00$ ,  $\pm 1.50$ ,  $\pm 2.00$ ,  $\pm 2.50$ )
- 570 2. Red/Green glasses
- 571 3. Red/Green bar reader
- 572 4. VA appropriate word searches (black print)

573  
574 Procedure:

- 575 1. The therapist should choose a font size that corresponds to 2 VA levels
- 576 above the VA of the amblyopic eye on the day of the therapy visit.

VA of amblyopic eye the day of the therapy visit:	Appropriate word search VA level:
20/100	20/120
20/80	20/100
20/70	20/90
20/60	20/80
20/50	20/70
20/40	20/60
20/30	20/50
20/20	20/40

- 577 2. The therapist may choose to have the patient perform this activity with either low
- 578 level word searches (easier), medium level word searches, or high level word
- 579 searches (harder) depending on the age and skill level of the patient. The word
- 580 searches may be found on the study provided CD of vision therapy activities.
- 581 3. Lighting should be high and reading material placed on a table top at 30-40 cm.
- 582 4. The patient should wear the red/green glasses and place the bar reader over the
- 583 word search so that the bars are oriented vertically. The word search and bar
- 584 reader should be placed in a sheet protector so that the patient may use a vis-à-
- 585 vis or dry erase marker to circle the words as they are found in the word search.
- 586 Once the activity is complete, the sheet protector can be wiped clean.
- 587 5. The therapist should cover each eye alternately and demonstrate that the bars
- 588 will appear black if suppression is present and instruct the patient to notify the
- 589 therapist if suppression is noted.
- 590 6. The patient should then look through the +1.00 side of the  $\pm 1.00$  flipper and
- 591 read the first word of the word search. The patient should be coached to relax
- 592 and "look far away" to clear this target.
- 593 7. As the patient searches for the first word of the word search, the patient should
- 594 be asked to flip the flipper to the minus side (-1.00) and think about "looking
- 595 hard" and "up close" to clear the text.
- 596 8. If suppression is noted, techniques for breaking suppression mentioned in the bar
- 597 reader technique should be employed.

598 9. The patient should continue to flip the flipper as he searches for each word in the  
599 word search wit/hout suppression until the flipper power becomes easy to  
600 perform (approximately 12 cycles/minute).

601 NOTE: The patient should be able to comfortably clear both sides of the flipper at a  
602 rate of 12cpm for 3-4 minutes before increasing the flipper power. (It is  
603 important to build speed and stamina.)

604 10. The flipper powers should be increased in 0.50D steps until  $\pm 2.50$  is performed  
605 easily. The following sequence should be followed:  $\pm 1.00 \rightarrow \pm 1.50 \rightarrow \pm 2.00 \rightarrow \pm 2.50$   
606

607 Coaching:

- 608 1. It is important to ask the patient throughout the activity questions to establish  
609 awareness of his focusing...“is one side of the flipper harder than the other?”,  
610 “are your eyes tightening or relaxing?”, “does the print look larger or smaller?”.  
611 The patient should be an active participant in the clearing of each lens.
- 612 2. To clear the plus lenses, the patient should be coached to “relax”, like “looking  
613 through the target...like looking far away.”
- 614 3. To clear the minus lenses, the patient should be coached to make her eyes “feel  
615 tight”, “look hard”, like looking up close.
- 616 4. If suppression is noted, the patient should blink or tap the bar reader to break  
617 the suppression. If the suppression is very deep, the patient may need  
618 additional work with anti-suppression activities before beginning binocular  
619 accommodative rock.
- 620 5. If the patient reports that the target splits apart or looks double, the therapist  
621 should remove the flipper and allow the patient to regain fusion. The flipper  
622 should be attempted again. If diplopia persists, the therapist may reduce the  
623 flipper power. If the patient still experiences diplopia, the patient’s vergence  
624 ranges are likely low and the patient is not ready for this activity.

625  
626 Goal:

627 Rapid (12 cpm) accommodative facility with less than 10% suppression with  
628  $\pm 2.50$  flipper.

629

630 **Binocular Accommodative Facility with Word Rock Cards**

631 Accommodative Therapy Phase 3

632

633 Purpose:

634 To develop binocular accommodative skills without suppression

635

636 Equipment:

637 1. Binocular accommodative flippers ( $\pm 1.00$ ,  $\pm 1.50$ ,  $\pm 2.00$ ,  $\pm 2.50$ )

638 2. Red/Green glasses

639 3. Study provided workbook with VA appropriate red word rock cards.

640

641 Procedure:

642 1. The therapist should choose a font size that corresponds to 2 VA levels  
643 above the VA of the amblyopic eye on the day of the therapy visit.

VA of amblyopic eye the day of the therapy visit:	Appropriate workbook VA level:
20/100	20/120
20/80	20/100
20/70	20/90
20/60	20/80
20/50	20/70
20/40	20/60
20/30	20/50
20/20	20/40

644

645 2. There are two word rock cards for each VA level. The number of the  
646 word rock card corresponds to the VA level of the text. The small letter  
647 "a" or "b" designates which version of that card is being used. Card  
648 "60a" for example would be the first 20/60 VA level card in the 20/60  
649 sequence. The therapist may choose either version a or b for the patient  
650 to perform.

651 3. Lighting should be high and reading material held at 30-40 cm.

652 4. The patient should wear the red/green glasses with the red lens over the  
653 non-amblyopic eye.

654 5. Before beginning the procedure, the therapist should demonstrate the  
655 suppression cues to the patient by covering the amblyopic eye. With the  
656 amblyopic eye covered, the red text will disappear. The therapist should  
657 tell the patient to let the therapist know right away if the text disappears  
658 because this indicates that the amblyopic eye is suppressing or  
659 "sleeping".

660 6. Begin with the  $\pm 1.00$  flipper lenses and have the patient look through  
661 either the plus or minus side of the flipper.

662 7. The patient should read the text in the first row of the left column of the  
663 word rock card. This column will give the patient a cue for what words to  
664 look for on that row. (For example, the text may say "find colors" and  
665 the patient must find all the color words within that row.) The patient

666 should read each word on the first row alternating between the plus and  
667 minus sides of the flipper looking for the words indicated in the first  
668 column. Initially, the patient should be allowed as much time as  
669 necessary to clear each side of the flipper.

670 Note: The text in the first column is small and may be difficult for the  
671 patient to read with the amblyopic eye. The therapist may read this print  
672 to the patient if he has difficulty.

- 673 8. If the patient suppress the amblyopic eye, she will report the reading  
674 material to have a red hue and the text will not be visible.
- 675 9. To break suppression, have patient blink her eyes until the material  
676 reappears and is clear, tap the reading material with her finger, or briefly  
677 cover and uncover the non-amblyopic eye to view the text.
- 678 10. The flipper should be alternated until the patient has equal proficiency  
679 with the plus and minus lenses and is able to clear each lens rapidly (12-  
680 15 cycles per minute) for 2-3 minutes.
- 681 11. Lens powers should be increased in 0.50 increments as each lens is  
682 mastered (12 cpm) following this sequence:
  - 683 a.  $\pm 1.00$
  - 684 b.  $\pm 1.50$
  - 685 c.  $\pm 2.00$
  - 686 d.  $\pm 2.50$

687 NOTE: The patient should be able to comfortably alternate between  
688 the plus and minus lenses at 12cpm for 3-4 minutes before increasing  
689 the lens powers. (It's important to build stamina as well as speed.)  
690

691 Coaching:

- 692 1. It is important to ask the patient throughout the activity questions to  
693 establish awareness of his focusing... "is one lens harder than the other?",  
694 "are your eyes tightening or relaxing?", "does the print look larger or  
695 smaller?". The patient should be an active participant in the clearing of  
696 each lens.
- 697 2. To clear the plus lenses, the patient should be coached to "relax", like  
698 "looking through the target...like looking far away."
- 699 3. To clear the minus lenses, the patient should be coached to make her  
700 eyes "feel tight", "look hard", like looking up close.
- 701 4. If suppression occurs, the patient should blink her eyes, tap the target, or  
702 briefly cover and uncover the non-amblyopic eye to make the text visible.  
703

704 Goal:

705 The patient should be able to rapidly (approximately 12 cpm), alternately clear the text  
706 with +/-2.50 flipper lenses with suppression less than 10% of the time.  
707  
708

709 **Suppression Vision Therapy**



710 **Physiological Diplopia Awareness (Brock String)**

710

711

Suppression Therapy Phase 1

712

713 Purpose:

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To develop awareness of physiological diplopia and eliminate suppression.

715

716 Equipment:

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Brock string attached to an object at the patient's eye level on one end.

718

719 Procedure:

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- 721 1. One end of the string should be attached to a fixed object (door knob, cabinet handle, etc.) at eye level. The other end of the string should be held to the patient's nose so that the string is taught and parallel to the ground.
- 722 2. The three beads should be spaced out along the string so that one is at the end of the string (next to the door knob), one is approximately in the middle of the string, and the last is 10-12 inches from the patient's nose.
- 723 3. The patient should be shown how the string appears to each eye (i.e. cover the right eye and view it with the left and visa-versa). The string seen by the right eye will appear to originate from the direction of the left ear. The string seen by the left eye will appear to originate from the direction of the right ear. When seen with both eyes, the patient should see two strings.
- 724 4. Ask the patient to look at the far bead. If no suppression exists, the patient should report the appearance of one far bead and two strings touching at the far bead. The strings will look like a "V" coming toward the patient's face. The patient should also report that the middle and near beads appear double. If suppression is present, the patient will notice either all or part of one of the strings missing.

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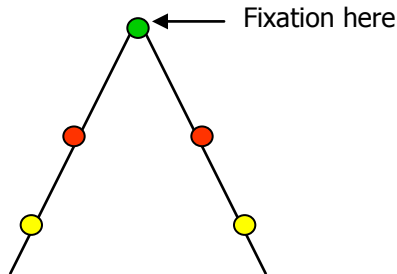
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- 741 5. If a string or beads disappear, then suppression exists. Suppression may be counteracted by one of the following (see "Coaching" below):

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- Wiggling the string

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- Blinking

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- Quickly covering and uncovering the suppressing eye

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- Blurring the image of the non-suppressing eye slightly with low plus lenses

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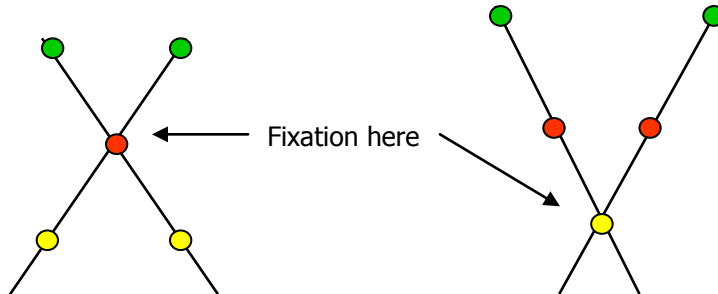
- Encouraging the patient to concentrate on finding the missing string

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- Red lens on the non-amblyopic eye

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- The patient should then be asked to look at the middle or near bead. The patient should see the strings make an "X" intersecting in the designated bead (if fixation is accurate). The patient should be aware of both strings and the physiological diplopia of the other two beads at all times.



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- Note: wherever the patient reports intersection of the strings, is where the patient is truly pointing the eyes.** If the strings cross in front of the designated bead, the eyes are eso. If the strings cross behind the bead, the eyes are exo. Once suppression is well controlled, the patient should be coached to have accurate fixation at each bead.
  - Patients with eso posture should be coached to "relax" their eyes and look slightly behind the bead until the strings appear to cross in the middle of the bead.
  - Patients with exo posture should be coached to "tighten" their eyes and look slightly in front of the bead until the strings appear to cross in the middle of the bead.
- The patient should shift gaze from one bead to the other while maintaining awareness of physiological diplopia.

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#### Coaching:

- If suppression exists, the patient should try blinking or wiggling the string. Also, have the patient "look for" the missing string and point to the location that the patient should observe the string. It may be helpful to quickly cover and uncover the suppressing amblyopic eye with a cover paddle (this acts to flash the image seen by the suppressing amblyopic eye and break down suppression). A low powered plus lens may be used over the non-amblyopic eye to blur the image slightly and encourage the use of the suppressing eye.
- It may be necessary to use a Red lens over the non-amblyopic eye if suppression is very deep. This will give the patient a red string (seen by the non-amblyopic eye) and a white string (seen by the amblyopic eye) to look for. This will decrease the luminance of the string seen by the non-amblyopic eye and may help break suppression of the amblyopic eye.
- Eventually, all aids to control suppression should be weaned away until the patient can maintain control with no assistance or coaching.

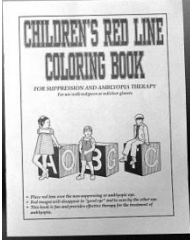
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#### Goal:

Ability to fixate on each bead with awareness of physiological diplopia and control of suppression at least 90% of the time.

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**Anaglyphic Drawing: Red line coloring book**

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Suppression Therapy Phase 1

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Purpose:

Elimination of monocular suppression

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Equipment:

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1. Red/Green glasses
2. wipe-off or dry erase marker
3. Red outlined picture on white paper—Red Line Coloring Book
4. sheet protector

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Procedure:

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1. The pages of the red line coloring book should be separated and each covered with a sheet protector to allow for multiple uses of each page
2. The patient must wear the red/green glasses with the red lens over the non-amblyopic eye and the green lens over the amblyopic eye.
3. The red pictures in the workbook will be visible only to the amblyopic eye. The patient should be made aware that the pictures will disappear if suppression is present by covering the amblyopic eye. The patient is instructed to notify the therapist if suppression is noticed while performing this activity.
4. With both eyes viewing, if the patient observes disappearance of the picture, then suppression is present. Suppression may be counteracted by using one of the following:
  - a. Allow the patient to use a close working distance
  - b. Tapping the marker on the page or wiggling the workbook
  - c. Rapidly covering and uncovering the non-amblyopic eye or blinking
  - d. Coach the patient to "look hard" out of the amblyopic eye (this may be encouraged by tapping the patient's temple by that eye or by wiggling fingers temporal to the amblyopic eye)
5. The patient should be instructed to trace or outline the pictures using the wipe-off pen or dry erase marker without suppression.
6. The patient should be encouraged to maintain a working distance of 30-40 cm at all times.

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Goal:

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Elimination or reduction of suppression to less than 10% of the time in the amblyopic eye

832 **Face Form**

833 Suppression Therapy Phase 1 & 2

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835 Purpose: Elimination of monocular suppression of the amblyopic eye

836

837 Equipment:

838 Face Form 1 (all red symbols) from the Red/Green Workbook

839 Face Form 2 (red and blue symbols) from the Red/Green Workbook

840 Red/Green Glasses

841 Stopwatch

842

843 Procedure:

844 *Phase 1*

- 845 1. The patient should wear red/green glasses with the red lens over the non-
- 846 amblyopic eye. The patient should be seated at a desk/table.
- 847 2. The patient should place face form 1 flat on the table top. All of the faces on
- 848 this form are red can only be seen by the amblyopic eye wearing the green lens.
- 849 The therapist should cover the amblyopic eye and ask the patient to view the
- 850 form. The therapist should explain that the faces will disappear if the amblyopic
- 851 eye "turns off". The patient should be instructed to notify the therapist if
- 852 suppression is noticed.
- 853 3. The patient should start by placing his index finger on the first face on the top
- 854 line of the chart (happy face).
- 855 4. The patient then moves this finger to touch the corresponding face at the bottom
- 856 of the page (happy face).
- 857 5. The patient then returns to the top row and places his finger on the second face
- 858 on the top row (happy face) and then touches the happy face at the bottom of
- 859 the page.
- 860 6. The patient should continue alternately touching the next face on the row and
- 861 the corresponding face at the bottom of the page until all 5 rows are completed.
- 862 7. The patient should use his dominant hand to point and the non-dominant hand
- 863 to hold the page. The therapist should time the patient as he performs this task.
- 864 8. The patient should be encouraged to do this as quickly as possible without
- 865 losing his place and without suppressing. The therapist can help the patient if
- 866 he gets lost while performing this task.
- 867 9. The patient should be encouraged to keep a 30-40 cm working distance at all
- 868 times.

869 *Phase 2*

- 870 1. The patient should be seated at a desk/table while wearing red/green glasses
- 871 with the red lens over the non-amblyopic eye.
- 872 2. The therapist should place the face form 2 on the table top. Form 2 has red and
- 873 blue faces. The therapist should cover the patient's amblyopic eye to
- 874 demonstrate that the red faces disappear when the amblyopic eye "turns off".
- 875 The patient should be instructed to notify the therapist if suppression occurs.
- 876 3. The patient is instructed to alternately touch the sequence of faces on each row
- 877 with the matching face at the bottom of the page as he did during phase 1.
- 878

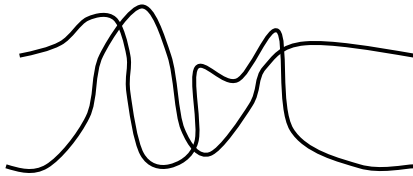
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Coaching:

1. The patient should be encouraged to perform this activity without suppression. If the red symbols disappear, the patient should be coached to “turn the amblyopic eye back on” by doing one of the following:
  - a. Blinking
  - b. Tapping the missing symbols with a finger or pencil
  - c. “looking hard” out of that eye
  - d. Wiggling his fingers beside the suppressing eye
  - e. Briefly cover the non-amblyopic eye to see the symbols and try to keep them visible while the eye is then uncovered
2. The patient should be encouraged to go as quickly as possible while performing this activity (“go faster! Keep going! Etc.”)
3. The patient’s time should be recorded in the record so that the patient may try to “break his record” with each performance of this task.
4. If the patient struggles to keep his place, the therapist may use a sheet of paper to cover the top four rows and only expose the bottom row first. The patient performs the activity with the bottom row and then the therapist moves the paper upward to expose the fourth row and allows the patient to complete this row. This is done until all five rows are exposed.

Goal:

To accurately complete form 1 and form 2 in less than a minute for each with the elimination or reduction of suppression to less than 10% of the time in the amblyopic eye.



## Line Tracing

Suppression Therapy Phase 1 & 2

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906

907

908 Purpose:

909 Elimination of monocular suppression of the amblyopic eye

910

911 Equipment:

912 Tracing Patterns (all red) in the Red/Green Workbook with sheet protectors

913 Red/Green glasses

914

915 Procedure:

916 *Phase 1*

917 1. The patient is seated at a table or desk while wearing the red/green glasses with  
918 the red lens on the non-amblyopic eye.

919 2. The visual tracing patterns have squiggly lines connecting a number on the left  
920 side of the page to a letter on the right side of the page. The line patterns are  
921 all red and only visible to the amblyopic eye. The therapist should cover the  
922 patient's amblyopic eye to demonstrate that all the lines disappear if the eye  
923 "turns off". The patient is instructed to tell the therapist if this occurs while  
924 performing the activity.

925 3. The patient should begin with pictures with one or two lines that are easy to  
926 follow and gradually become more challenging and with increasing numbers of  
927 lines.

928 4. Initially, the patient is asked to trace each line with his finger, pointer, or a wipe  
929 off pen to determine which items each line connects. As the patient does this,  
930 the therapist is watching to make sure that there is no confusion at line  
931 intersections and guides the patient if difficulty arises. The patient should be  
932 frequently asked if suppression is noted while the patient performs this activity.

933 5. As proficiency improves, the patient is asked to trace the lines visually without  
934 the use of his finger, pointer, or pen.

935 6. Gradually more complicated patterns are introduced.

936 7. The patient should be encouraged to keep a 30-40 cm working distance at all  
937 times.

938 *Phase 2*

939 This activity may be continued into phase two and is performed the same way as  
940 phase one. During phase two, the patient is encouraged to perform the patterns  
941 more quickly with less suppression without the need for a pointer or marker.

942

943 Coaching:

944 1. The patient should be encouraged to perform this activity without suppression.  
945 If the red lines disappear, the patient should be coached to "turn the amblyopic  
946 eye back on" by doing one of the following:

947 a. Blinking

948 b. Tapping the missing lines with a finger or pencil

949 c. "looking hard" out of that eye

950 d. Wiggling his fingers beside the suppressing eye

- 951 e. Briefly cover the non-amblyopic eye to see the lines and try to keep them  
952 visible while the eye is then uncovered
- 953 2. The patient is directed to watch closely and avoid turning at line intersections
  - 954 3. The therapist and patient may have a friendly racing competition once the  
955 patient becomes proficient

956

957 Goal: To accurately visually trace line patterns of considerable complexity with  
958 elimination or reduction of suppression to less than 10% of the time in the amblyopic  
959 eye.

960  
961  
962



## **Anaglyphic Drawing: Red Crayon Activities**

963

964 Suppression Therapy Phase 1

965

966 Purpose:

967 Elimination of monocular suppression

968

969 Equipment:

970 1. Red/Green glasses

971 2. "Red" Crayola crayons

972 3. Mazes and Symbol Sequences from the Black and White Workbook

973

974 Procedure:

975 1. The patient must wear the red/green glasses with the red lens over the non-

976 amblyopic eye and the green lens over the amblyopic eye.

977 2. The therapist may select a maze pattern or symbol tracking activity from the

978 Black and White Workbook. The books are sequenced with increasing difficulty

979 from level 1 through 3. The therapist should pick the level that is appropriate for

980 the patient's age and skill.

981 3. The patient is instructed to use the red crayon to complete mazes or symbol

982 sequences. The red lines made by the crayon will be visible to the amblyopic

983 eye and not visible to the non-amblyopic eye. The patient must use the

984 amblyopic eye to successfully complete the activity.

985 4. If the patient observes disappearance of the red lines, then suppression is

986 present. Suppression may be counteracted by using one of the following:

987 a. Allow the patient to use a close working distance

988 b. Tapping the crayon on the page or wiggling the workbook

989 c. Rapidly covering and uncovering the non-amblyopic eye or blinking

990 d. Coach the patient to "look hard" out of the amblyopic eye (this may be

991 encouraged by tapping the patient's temple by that eye or by wiggling

992 fingers temporal to the amblyopic eye)

993 5. As a variation, the therapist may also play games such as tic-tac-toe or hangman

994 with the patient while using the red crayons.

995 6. The patient should be able to complete the near activities without suppression

996 (keep the red crayon lines visible throughout the activity).

997 7. The patient should be encouraged to maintain a working distance of 30-40 cm at

998 all times.

999

1000 Goal:

1001 Elimination or reduction of suppression to less than 10% of the time in the

1002 amblyopic eye.

1003



## Bar Reader

1004

1005 Suppression Therapy Phase 2

1006

1007 Purpose:

1008 To eliminate suppression

1009

1010 Equipment:

1011 1. Red/Green Bar reader

1012 2. Red/Green glasses

1013 3. VA appropriate word searches

1014 4. Sheet protector

1015 5. Wipe-off or dry erase pen

1016

1017 Procedure

1018 The therapist should choose a font size that corresponds to 2 VA levels above the VA of  
1019 the amblyopic eye on the day of the therapy visit.

VA of amblyopic eye the day of the therapy visit:	Appropriate word search VA level:
20/100	20/120
20/80	20/100
20/70	20/90
20/60	20/80
20/50	20/70
20/40	20/60
20/30	20/50
20/20	20/40

1020

1. 1. The therapist may choose to have the patient perform this activity with either low level word searches (easier), medium level word searches, or high level word searches (harder) depending on the age and skill level of the patient. The word searches may be found in the Black and White Workbook.

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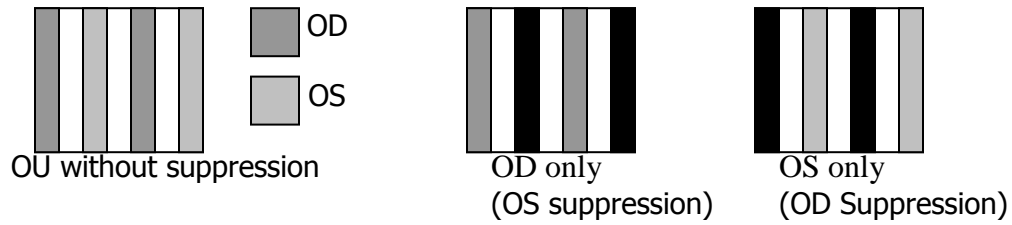
1034

1035

2. The bar reader (with the bars oriented vertically) should be placed on top of the word search and both should be placed in a sheet protector. The patient should wear the red/green glasses. The therapist should show the patient what each eye sees individually by covering the right eye so the patient can see what the left eye sees and visa-versa.

3. When using the red and green bar reader, the eye with the red filter will be able to see through the red bars while the green bars appear black. The eye with the green filter will be able to see through the green bars but not the red ones. For the patient to be able to read across the entire line of text, both eyes must be working (i.e. no suppression).

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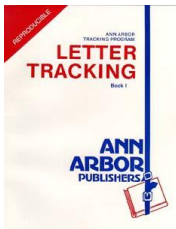


4. The patient should be asked if any of the bars appear black as they read the lines. The bars may look "dark" but the words are still visible. This is not suppression, it is an artifact of the decreased luminance on the text with the use of the filters. If the bars look black and the patient can not see the letters beneath the bars, then suppression is present. Suppression may be counteracted by using one of the following:
  - a. Allow the patient to use a close working distance
  - b. Tap or wiggle the bar reader
  - c. Rapidly cover and uncover the non-amblyopic eye
  - d. Coach the patient to "look hard" out of the amblyopic eye (this may be encouraged by tapping the patient's temple by that eye or by wiggling fingers temporal to the amblyopic eye)
  - e. Blur the non-amblyopic eye slightly with a low plus lens
5. As suppression becomes easier to control, the coaching techniques should be withdrawn. The patient should be able to read the text and complete the word searches without suppression.
6. The patient should be encouraged to maintain a working distance of 30-40 cm at all times.

Goal:

Elimination or reduction of suppression to less than 10% of the time in the amblyopic eye.

1071



## **Anaglyphic Letter Tracking**

1072

1073 Suppression Therapy Phase 2 & 3

1074

1075 Purpose:

1076 Elimination of monocular suppression

1077

1078 Equipment:

1079

1. Red/Green glasses

1080

2. Ann Arbor Red Letter Tracking book

1081

3. Sheet protectors

1082

4. Erasable Vis-à-vis pens or dry erase markers

1083

1084 Procedure:

1085

1. The pages of the letter tracking book should be separated and each covered with a sheet protector to allow for multiple uses of each page.

1086

1087

2. The patient must wear the red/green glasses with the red lens over the non-amblyopic eye and the green lens over the amblyopic eye.

1088

1089

3. The patient should begin with a page of larger text (a page with 2 paragraphs).

1090

Each paragraph consists of non-sense words written in red ink. To see the

1091

letters, the patient must use the amblyopic eye. The therapist should

1092

demonstrate how the letters disappear by covering the amblyopic eye. The

1093

patient is instructed to notify the therapist if suppression is appreciated while

1094

performing this activity.

1095

4. The patient is instructed to use the vis-à-vis pen to begin underlining the first

1096

line of non-sense words looking for the first letter in the alphabet, "a". When the

1097

patient finds the letter "a", he should draw a loop around it and then return to

1098

underlining the line of text looking for the next alphabet letter, "b". The patient

1099

should continue underlining and looping consecutive alphabet letters until he

1100

completes the entire alphabet hidden within the paragraph.

1101

5. If the patient observes disappearance of the red letters, then suppression is

1102

present. Suppression may be counteracted by using one of the following:

1103

a. Allow the patient to use a close working distance

1104

b. Tapping the pen on the page or wiggling the workbook

1105

c. Rapidly covering and uncovering the non-amblyopic eye or blinking

1106

d. Coach the patient to "look hard" out of the amblyopic eye (this may be

1107

encouraged by tapping the patient's temple by that eye or by wiggling

1108

fingers temporal to the amblyopic eye)

1109

6. As the patient's suppression lessens and the patient's visual acuity improves,

1110

smaller font should be attempted.

- 1111 7. The patient should be able to accurately find the alphabet letters without  
1112 suppression using the smallest font size.  
1113 8. The patient should be encouraged to maintain a working distance of 30-40 cm at  
1114 all times.

1115

1116 Goal:

1117 Phase 2: Successful completion of 2 and 3 paragraph pages (larger font sizes)  
1118 with the elimination or reduction of suppression to less than 10% of the time in  
1119 the amblyopic eye.

1120

1121 Phase 3: Successful completion of 4 and 6 paragraph pages (smaller font sizes)  
1122 with the elimination or reduction of suppression to less than 10% of the time in  
1123 the amblyopic eye.

1124

1125

1126

1127 **Number Find**

1128 Suppression Therapy Phase 3

1129

1130 Purpose:

1131 To eliminate monocular suppression of the amblyopic eye

1132

1133 Equipment:

1134 Number Finds 1-50 (Red/Green Workbook)

1135 Number Finds 1-100 (Red/Green Workbook)

1136 Red/Green glasses

1137 Vis-à-vis pen or fine tipped dry erase marker

1138 Stopwatch

1139

1140 Procedure:

- 1141 1. The patient should wear the red/green glasses with the red lens on the non-
- 1142 amblyopic eye while the patient is seated at a desk/table.
- 1143 2. The Number Find Workbook has pages with rows of red and green numbers in
- 1144 random order. Hidden within the numbers is the sequence 1 through 50 or 1
- 1145 through 100. The task is to look across each row to find the hidden numbers in
- 1146 ascending sequence.
- 1147 3. Patients should initially begin with the 1-50 number find worksheets. As the
- 1148 patient's skill improves, she may proceed to the 1-100 worksheets.
- 1149 4. The therapist should demonstrate what suppression will look like by covering the
- 1150 patient's amblyopic eye. The patient should observe the disappearance of the
- 1151 red numbers. The patient is instructed to notify the therapist if she notices
- 1152 disappearance of any of the numbers.
- 1153 5. The patient is asked to use her marker to begin underlining the numbers on the
- 1154 first row of the page looking for the number 1. Once she finds it, she should
- 1155 loop the number and continue underlining looking for the next number, 2.
- 1156 6. Underlining and then looping each number in ascending order is done until the
- 1157 patient finds all the numbers 1-50 or 1-100.
- 1158 7. The patient should be encouraged to keep a 30-40 cm working distance at all
- 1159 times.
- 1160 8. The therapist may time the patient's performance to encourage speed as
- 1161 proficiency improves
- 1162 9. At the completion of the activity, the therapist should wipe the sheet protector
- 1163 clean.

1164

1165 Coaching:

- 1166 1. The patient should be encouraged to perform this activity without suppression.
- 1167 If the red numbers disappear, the patient should be coached to "turn the
- 1168 amblyopic eye back on" by doing one of the following:
- 1169 a. Blinking
- 1170 b. Tapping the missing numbers with a finger or pencil
- 1171 c. "looking hard" out of that eye
- 1172 d. Wiggling his fingers beside the suppressing eye

- 1173 e. Briefly cover the non-amblyopic eye to see the numbers and try to keep  
1174 them visible while the eye is then uncovered  
1175 2. The patient should be encouraged to "look ahead" down the row to find the next  
1176 number in the sequence. This will improve the patient's speed.  
1177 3. The patient may be timed and encouraged to "break his record" with each  
1178 workbook page to improve his speed.  
1179 4. If a patient misses a number in the sequence, the therapist may tell the patient  
1180 to look back for the missed number before moving to the next one.  
1181

1182 Goal:

1183 Accurately locate numbers 1-100 with the elimination or reduction of suppression  
1184 to less than 10% of the time in the amblyopic eye.  
1185

1186 **String Reading**

1187 Suppression Therapy Phase 3

1188

1189 Purpose:

1190 To eliminate monocular suppression of the amblyopic eye

1191

1192 Equipment:

1193 String Reading Worksheets (Levels 1, 2, and 3) from the Red/Green Workbook

1194 Red/Green glasses

1195 Stopwatch

1196 Metronome (optional)

1197

1198 Procedure:

1199 **1.** The patient should begin with worksheet level 1 placed on a table top at a 30-40  
1200 cm working distance

1201 **2.** The patient should wear the red green glasses with the red lens on the non-  
1202 amblyopic eye.

1203 **3.** The worksheet has a series of red and green letters organized in lines across the  
1204 page. The therapist should cover the patient's amblyopic eye to demonstrate  
1205 how the red letters disappear when the amblyopic eye "turns off". The patient is  
1206 instructed to notify the therapist if any of the letters disappear.

1207 **4.** Some of the letters on the form are single (A) and some are double (AA). The  
1208 patient should quickly scan across the first row and read aloud only the single  
1209 letters as he goes from left to right. Once the patient demonstrates that he  
1210 understands the task, he should be asked to read the entire page calling out only  
1211 the single letters as quickly as he can.

1212 **5.** If the patient has great difficulty with this activity, he may use his finger initially  
1213 to develop a scanning pattern but then should be encouraged to discontinue this  
1214 as proficiency improves.

1215 **6.** The therapist should time the patient and encourage the patient to go faster with  
1216 each trial without suppression.

1217 **7.** As proficiency improves, the child should be moved through worksheet levels 2  
1218 and 3.

1219

1220 Coaching:

1221 **1.** The patient should be encouraged to perform this activity without suppression.  
1222 If the red letters disappear, the patient should be coached to "turn the amblyopic  
1223 eye back on" by doing one of the following:

1224 a. Blinking

1225 b. Tapping the missing letters with a finger or pencil

1226 c. "looking hard" out of that eye

1227 d. Wiggling his fingers beside the suppressing eye

1228 e. Briefly cover the non-amblyopic eye to see the letters and try to keep  
1229 them visible while the eye is then uncovered

1230 **2.** The patient may use his finger or other placeholder (ruler or bookmark under the  
1231 line) initially to assist with accurate eye movements.

- 1232 3. The therapist should encourage the patient to go as quickly as possible across  
1233 the page of letters and try to "break his record" from the previous trial.  
1234 4. The patient may be encouraged to call the letters out to the beat of a  
1235 metronome to increase the difficulty.  
1236

1236

1237 Goal:

1238 Smooth and proficient performance on Level 3 with the elimination or reduction  
1239 of suppression to less than 10% of the time in the amblyopic eye.  
1240

1240

1241

1242 **Vis-à-vis**

1243 Suppression Therapy Phase 3

1244

1245 Purpose:

1246 Elimination of monocular suppression at distance

1247

1248 Equipment:

1249 2 pairs of Polarized goggles

1250

1251 Procedure:

1252 1. The patient and the therapist both wear a pair of polarized spectacles and stand  
1253 facing each other. The patient and therapist should initially stand 2-3 feet from  
1254 one another.

1255 2. If the patient is not suppressing an eye, she should be able to see both of the  
1256 therapist's eyes through the therapist's polarized glasses. If she is suppressing  
1257 her right eye, the therapist's left eye will not be visible. If the patient is  
1258 suppressing her left eye, the therapist's right eye will not be visible. This should  
1259 be demonstrated to the patient by having the patient cover an eye while looking  
1260 at the therapist.

1261 3. Once the patient understands that when the therapist's right eye looks dark, she  
1262 is suppression her left eye and when the therapist's left eye looks dark, she is  
1263 suppression her right eye, then have the patient observe the therapist's eyes for  
1264 signs that she is suppressing. If suppression is noticed, the therapist should  
1265 coach the patient to "think hard about looking out of the suppressing eye" and  
1266 make it "come back on".

1267 4. Once the patient is able to keep both eyes from suppressing at a distance of 2-3  
1268 feet, the distance should be increased. Increasing distance makes it more  
1269 difficult to prevent suppression.

1270 5. To check the patient's attentiveness, the therapist may close an eye and ask the  
1271 patient if he can tell which of his eyes are closed. To correctly answer, the  
1272 patient must be able to see both of the therapist's eyes (have no suppression).

1273 6. Once the patient has demonstrated fairly good control of suppression, the  
1274 therapist may challenge the patient by having the patient control suppression  
1275 while balancing on one foot and/or by doing simple math problems or spelling  
1276 short words backwards.

1277

1278 Coaching:

1279 The patient should "look hard" out of the suppressing eye and try to "look  
1280 through the side of the glasses that look dark". Quick cover and uncover with  
1281 the cover paddle (or a hand) may help break suppression. If the patient can not  
1282 break suppression, the patient should be moved closer to the therapist.

1283

1284 Goal:

1285 To control suppression in the amblyopic eye (less than 10% of the time) and  
1286 maintain binocularity at all distances (2 to 10 feet)

1287

1288

## Vergence Vision Therapy

### 1289 **Barrel Cards**

1290 Vergence Therapy Phase 1

1291

#### 1292 Purpose:

1293 Develop the ability to voluntarily converge without suppression

1294

#### 1295 Equipment:

1296 1. Barrel Card

1297 2. Flip lenses (-2.00D)

1298

#### 1299 Procedure:

1300 1. The card is held between index and thumb on lower edge of the card.

1301 2. The card is held against the bridge of the nose so that the smallest barrel is  
1302 closest to the nose.

1303 3. While fixating on the barrel farthest away the patient should be able to report  
1304 seeing one far barrel that is a mixture of the red and green colors and the other  
1305 two barrels should appear double.

1306 4. If suppression is present, the patient may report seeing three barrels that are  
1307 either red or green (only seeing one side of the card). If suppression is present,  
1308 the patient should blink rapidly and look carefully for the missing barrels. The  
1309 therapist may very rapidly cover and uncover the suppressing eye to help break  
1310 suppression. Once suppression is broken, the patient should fuse the far barrel  
1311 into one reddish/greenish barrel.

1312 5. The patient then fixates the middle barrel. The patient should be aware that the  
1313 middle barrel is single and the other two barrels appear double.

1314 6. Instruct the patient to alternate fixation back and forth from the farthest barrel  
1315 to the middle barrel holding fixation on each barrel for 10 seconds. The patient  
1316 should be aware of the reddish/greenish barrel that they are looking at and the  
1317 diplopia of the barrels not being fixated.

1318

#### 1319 Coaching:

1320 If the patient experiences difficulty converging his eyes on the barrel, there are  
1321 several techniques the therapist can use to help him overcome this obstacle.

1322 a. Suggest that patient try and get the "feeling" of looking close and  
1323 crossing his or her eyes.

1324 b. Move the card farther away from the patient.

1325 c. Use binocular minus lenses to stimulate accommodative convergence.

1326 d. Cut the card in half length-wise to decrease the septum effect.

1327 If the patient has difficulty seeing both the red and green barrels at the same  
1328 time, the therapist should ask the patient to blink and think hard about seeing  
1329 the missing barrels. The patient may tap the side of the card that is missing or  
1330 the therapist may rapidly cover and uncover the suppressing eye.

1331

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Goal:

The patient can hold fusion for 10 seconds easily on the far and middle barrels.  
The patient should also be able to complete 10 cycles from the middle, to the far, and back to the middle barrel without suppression.

1339 **Computer Vergences**

1340 Vergence Therapy Phase 1

1341

1342 Purpose:

1343 Development of normal vergence ranges without suppression

1344

1345 Equipment:

1346 Computer with HTS Loaded

1347

1348 Procedure:

- 1349 1. Before the patient arrives the therapist should have the computer turned on and  
1350 the program ready for the patient:
- 1351 a. Click on <HTS Tools iNet> icon on the desktop
  - 1352 b. Click on <Sample Patient's icon>
  - 1353 c. Mode should be set to Manual, if it is set to active click on <Select  
1354 mode>. Enter the pass-code is 2020 and click on the <Manual> button  
1355 in the upper left hand corner, then click to <Return to Main Menu>
  - 1356 d. Click on <Run Program>
  - 1357 e. Click on <Vergence Base-In>
  - 1358 f. Set Duration to 4 Minutes and select <Classic> mode
- 1359 2. The patient wears the red/blue glasses and is seated before the computer.
- 1360 3. Instruct the patient to look for the "Square" popping out of the screen and for  
1361 the patient to click the corresponding arrow in the direction of the square that  
1362 "pops" out.
- 1363 4. As the patient correctly locates the square that pops out, the software will  
1364 automatically increase the vergence demand until the patient makes an error.  
1365 Errors will cause the software to decrease the vergence demand until the patient  
1366 can regain fusion.
- 1367 5. The program will stop after 4 minutes. The therapist must record the highest  
1368 vergence demand achieved.
- 1369 6. Next Click on <Return to Main Menu> and then select <Vergence Base-Out>
- 1370 7. Set the time for 4 minutes and select <Classic> mode.
- 1371 8. The program will stop after 4 minutes. The therapist must record the highest  
1372 vergence demand achieved.

1373

1374 Coaching:

- 1375 1. When training BI, the patient must be coached to relax his eyes and "look far  
1376 away" to keep the target fused.
- 1377 2. When training BO, the patient must be coached to tighten his eyes and "look  
1378 close" to keep the target fused.

1379

1380 Goal:

1381 15Δ BI and 25Δ BO

1382

1383

1384 **Computer Jump Ductions**

1385 Vergence Therapy Phase 2

1386

1387 Purpose:

1388 Development of normal vergence jumps without suppression

1389

1390 Equipment:

1391 Computer with HTS Loaded

1392

1393 Procedure:

1394 1. Before the patient arrives the therapist should have the computer turned on and  
1395 the program ready for the patient:

1396 a. Click on <HTS Tools iNet> icon on the desktop

1397 b. Click on <Sample Patient's icon>

1398 c. Mode should be set to Manual, if it is set to active click on <Select  
1399 mode>. Enter the pass-code is 2020 and click on the <Manual> button  
1400 in the upper left hand corner, then click to <Return to Main Menu>

1401 d. Click on <Run Program>

1402 e. Click on <Jump Duction>

1403 f. Set Duration to 4 Minutes and select <Run>

1404 2. The patient wears the red/blue glasses and is seated before the computer.

1405 3. Instruct the patient to look for the "Square" popping out of the screen and for  
1406 the patient to click the corresponding arrow in the direction of the square that  
1407 "pops" out.

1408 4. As the patient correctly locates the square that pops out, the software will  
1409 automatically increase the vergence demand until the patient makes an error.  
1410 Errors will cause the software to decrease the vergence demand until the patient  
1411 can regain fusion. With Jump Ductions, the program will alternate between BI  
1412 and BO vergence demands.

1413 5. The program will stop after 4 minutes. The therapist must record the highest  
1414 vergence demands achieved.

1415 6. Next Click on <Return to Main Menu> and then select <Jump Ductions> again

1416 7. Set the time for 4 minutes and select <Run>.

1417 8. The program will stop after 4 minutes. The therapist must record the highest  
1418 vergence demands achieved.

1419

1420 Coaching:

1421 1. When training BI, the patient must be coached to relax his eyes and "look far  
1422 away" to keep the target fused.

1423 2. When training BO, the patient must be coached to tighten his eyes and "look  
1424 close" to keep the target fused.

1425

1426 Goal:

1427 Jumps between 15Δ BI and 25Δ BO

1428

1429 **Vectogram**

1430 Vergence Therapy Phase 1, 2, & 3

1431

1432 Purpose:

1433 Phase 1: To develop normal SILO/Localization and vergence ranges

1434 Phase 1-2: To develop vergence recoveries

1435 Phase 3: To improve the speed and efficiency of vergence jumps

1436

1437 Equipment:

1438 1. 2 Quoit Vectograms (rope)

1439 2. Polarized Goggles

1440 3. Pointer (optional)

1441 4.  $\pm 2.00$  flipper (optional)

1442

1443 Procedure:

1444

1445 *Phase 1: SILO/Localization*

1446 1. The patient, wearing the polarized goggles, is seated approximately 40 cm from  
1447 the Quoit Vectogram placed on an illuminated vectogram holder.

1448 2. The vectogram is initially placed at zero and the patient is asked if they can see  
1449 the "R" and the "L" and the "plus sign" at the top of the rope. If the patient is  
1450 suppressing and can not see all of the targets, the patient is asked to blink and  
1451 look hard out of the suppressing eye. The patient may move slightly closer or  
1452 the therapist may quickly cover and uncover the suppressing eye to break  
1453 suppression. The remaining procedure can not be performed until suppression is  
1454 broken.

1455 3. If no suppression is present, the vectogram is placed at "C" and is slowly moved  
1456 in the base out direction to "3". The vectogram should be slowly changed back  
1457 and forth from "C" and "3" while the patient is asked to appreciate if the target  
1458 appears to get larger, smaller, closer, or farther.

1459 a. With convergence (numbers), the patient should report the target gets  
1460 smaller and closer. The rope should appear to float in front of the plastic.  
1461 To illustrate, the patient may be asked to point to the location of the rope  
1462 with the pointer and outline it's edges.

1463 b. With divergence (letters), the patient should report the target gets larger  
1464 and farther. The rope should appear to float behind the plastic.

1465 c. The acronym SILO is used to describe the appearance of the target while  
1466 converging and diverging. SILO stands for "Smaller-in, Larger-out". As  
1467 the patient converges, the targets get smaller and in closer to the patient  
1468 and as the patient diverges, the targets get larger and move out away  
1469 from the patient.

1470 Occasionally patients initially have difficulty appreciating SILO but with coaching  
1471 most will recognize it. Patients not recognizing SILO may still proceed to phase  
1472 2 but should continually be coached to look for SILO cues.

1473

1474

1475 *Phase 1-2: Range Extension*

- 1476 1. Once the patient is able to see the targets without suppression and has been  
1477 introduced to SILO, he should begin vergence range extension.
- 1478 2. Vergence range extension requires that the ropes be slowly separated while the  
1479 patient tries to maintain fusion.
- 1480 a. Convergence training (BO): The ropes are separated so that the numbers  
1481 are visible on the scale at the bottom of the vectogram. The patient  
1482 should be coached to look hard and keep the eyes crossed like looking up  
1483 close. When fusion is lost, the patient will report 2 ropes and the number  
1484 on the vectogram scale should be recorded. The patient should then be  
1485 coached to re-converge his eyes to regain fusion ("get the ropes back  
1486 together"). If the patient struggles to regain fusion, the therapist may  
1487 use one of the following techniques to assist with convergence:
- 1488 i. The patient may hold a pointer in front of the vectograms at eye  
1489 level. The therapist should instruct the patient to make the  
1490 pointer single and be aware of the ropes. Once the pointer is  
1491 single (the eyes are accurately converged on the pointer), the  
1492 patient may move the pointer slowly toward or away from him  
1493 until the rope looks fused and floating in front of the plastic. The  
1494 pointer should then be moved out of view while the patient  
1495 maintains fusion of the ropes.
- 1496 ii. The therapist may hold -1.50 lenses before both of the patient's  
1497 eyes and instruct him to make the vectogram clear. Clearing the  
1498 lenses will stimulate accommodation (focusing) and should help  
1499 the patient regain fusion. Once the patient sees the ropes fused,  
1500 the patient should keep fusion as the lenses are removed.
- 1501 iii. The therapist may use the above techniques while SLOWLY  
1502 moving the ropes together (decreasing the vergence demand)  
1503 until the patient regains fusion.
- 1504 The number where the patient regains fusion should be recorded.
- 1505 b. Divergence training (BI): The ropes are separated so that the letters are  
1506 visible on the scale at the bottom of the vectogram. The patient should  
1507 be coached to relax and look through the target to keep it single. When  
1508 fusion is lost, the patient will report 2 ropes and the letter on the  
1509 vectogram scale should be recorded. The therapist should then coach  
1510 the patient to regain fusion by diverging his eyes and looking through the  
1511 target. If the patient struggles to regain fusion, the therapist may use  
1512 one of the following techniques to assist with divergence:
- 1513 i. The therapist may tap the back of the vectogram holder and ask  
1514 the patient to pretend he's looking through the target and allow it  
1515 to appear blurry. Once fusion is regained, the patient should try  
1516 to get the ropes clear again.
- 1517 ii. The therapist may hold +2.00 lenses before both of the patient's  
1518 eyes and instruct him to make the vectogram clear. Clearing  
1519 these lenses will relax accommodation (focusing) and should help  
1520 the patient diverge. Once the patient sees the ropes fused, the  
1521 patient should keep fusion as the lenses are removed.

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- iii. The therapist may remove the vectogram from the lighted holder and place them in a clear slide holder. The therapist can then hold the vectograms in front of the patient while he looks through them across the room. This is intended to help the patient "feel" divergence. Once he can successfully regain fusion on the hand-held slide holder, ranges should then again be worked on the lighted holder.
  - iv. The therapist may use the above techniques while SLOWLY moving the ropes together (decreasing the vergence demand) until the patient regains fusion.  
The letter where the patient regains fusion should be recorded.
3. Once the patient can successfully maintain fusion and regain it up to the letter "L" and the number "30" the patient should begin vectogram jumps.

1536 *Phase 3: Jumps*

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1. Two Quoit vectograms are placed on the illuminated vectogram holder (one above the other). The top vectogram is placed on "C" and the bottom vectogram is placed on "3".
  2. The patient is asked to alternately fuse the vectograms and appreciate the change in size and localization each time. The patient should be able to alternate fusion easily and rapidly before the vergence demand is changed.
  3. The vergence demand should be increased by 3 units for both vectograms while the patient continues to alternately fuse the targets. As proficiency improves at each level, 3 unit increases continue until "L" and "30" are reached.

1547 Coaching:

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1. The further apart the patient pulls the pictures, the more dramatic the depth effect should be. If the patient is having difficulty judging the depth, use the pointer stick to localize where the target is.
  2. When training convergence, the patient should be coached to "look close" and make the eyes "feel tighter".
  3. When training divergence, the patient should be coached to "look far" and make the eyes "feel relaxed".

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1557 Goal:

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- Phase 1: Appreciation of SILO and localization without suppression from C to 3.  
Phase 1-2: Smooth vergences and recovery of fusion to L and 30.  
Phase 3: Jump vergences from L to 30.

1566 **Mini-Tranaglyphs**

1567 Vergence Therapy Phase 2 and 3

1568

1569 Purpose:

1570 To train fusional vergence ranges and recoveries

1571

1572 Equipment:

1573 1. Mini-tranaglyph

1574 2. Red/Green glasses

1575

1576 Procedure:

- 1577 1. The mini-anaglyph consists of two separate plastic targets which can be  
1578 superimposed on each other and the disparity between them increased or  
1579 decreased. The mini-tranaglyph has two rings that appear 3 dimensional  
1580 surrounding a box, "x", and a circle. If the inner ring goes flat or one of the  
1581 center shapes disappears, then suppression is present. The target should be  
1582 held at 40 cm.
- 1583 2. The patient should wear the glasses so that the red lens is over the right eye  
1584 and the green lens is over the left eye. This will allow the right eye to see  
1585 the green target and the left eye to see the red target.
- 1586 3. The targets should initially be superimposed and the arrow (triangle) at the  
1587 top of the rings pointing to the zero point along the numbered scale at the  
1588 top of the mini-tranaglyph.
- 1589 4. The patient should be made aware of the presence of the box, the "x", and  
1590 the circle in the center of the rings as well as the popping out of the smaller  
1591 center ring. The patient should cover her right eye and notice the  
1592 disappearance of the box and then cover her left eye and notice the  
1593 disappearance of the circle. The patient should be instructed to tell the  
1594 therapist if any of these shapes disappear during the activity since this is an  
1595 indication that she is suppressing an eye.
- 1596 5. To train negative fusional vergences (base in), the target must be turned  
1597 upside down. Turning the target upside down will allow the indicator arrow to  
1598 continue pointing at the diopter scale at the top of the slider. The two  
1599 targets should then be separated slowly in the BI direction (the red target is  
1600 moved to the left of the green target). The patient should be coached to  
1601 relax and look through the targets to keep fusion. The targets are separated  
1602 until fusion is lost. The therapist should note the vergence demand in prism  
1603 diopters as the number above the red triangle at the top of the larger red  
1604 ring. To regain fusion, the patient is coached to look through the target as  
1605 the separation is slowly decreased until divergence is re-established. The  
1606 therapist should again note the recovery prism diopter amount on the scale  
1607 above the red ring. The patient should be asked about localization, SILO,  
1608 and the presence of the box, "x", and circle while performing this technique.
- 1609 6. To train positive fusional vergences (base out), the target should be turned  
1610 right side up and the two targets should be separated slowly in the BO  
1611 direction (the red target is moved to the right of the green target). The  
1612 patient should be coached to look hard and cross the eyes to maintain fusion.

1613 The targets are slowly separated until fusion is lost. To regain fusion, the  
1614 patient should be coached to look hard in front of the target as the  
1615 separation is slowly decreased until fusion is re-established. The therapist  
1616 should note the dioptric demand at the fusion break and recovery points.  
1617 The patient should be asked about localization, SILO, and the presence of  
1618 the box, "x", and circle while performing this technique.  
1619

1620 Coaching:

- 1621 1. When training base out (convergence), the patient should be coached to look  
1622 hard and cross the eyes. The patient should appreciate that the image moves  
1623 closer and gets smaller with convergence. The patient may use a pointer held in  
1624 front of the target to help guide convergence and obtain fusion. As the patient's  
1625 skill improves, the use of the pointer should be discouraged.
- 1626 2. When training base in (divergence), the patient should be coached to relax and  
1627 look far away. The patient should appreciate that the image goes farther away  
1628 and gets larger. The therapist may wiggle his fingers behind the target to help  
1629 guide divergence if this is helpful.
- 1630 3. If the patient experiences suppression (the box or the circle disappears), the  
1631 patient should blink and/or gently shake the target to bring the target back into  
1632 view. It may also help to decrease the vergence demand.

1633  
1634 Goal:

1635 *Phase 2:* Maintain and regain fusion to at least 8Δ Base-In and 12Δ Base-Out without  
1636 suppression.

1637 *Phase 3:* Maintain and regain fusion to 15Δ Base-In and 25Δ Base-Out without  
1638 suppression.

1639

1640 **Physiological Diplopia Awareness (Brock String) with Loose Prisms**

1641 Vergence Therapy Phase 2

1642

1643 Purpose:

1644 To develop accurate control of divergence and convergence

1645

1646 Equipment:

1647 Brock String

1648 Loose prisms (6 $\Delta$ , 8 $\Delta$ , 10 $\Delta$ , 12 $\Delta$ , 15 $\Delta$ , 20 $\Delta$ , and 25 $\Delta$ )

1649

1650 Procedure:

1651 1. Once the patient has shown the ability to easily and accurately perform the Brock

1652 string procedure the therapist can add this to improve vergence capabilities.

1653 2. The patient should fixate the near bead at 30-40 cm on the Brock string. The

1654 therapist then introduces a 6 $\Delta$  BI loose prism in front of the amblyopic eye and

1655 asks the patient to regain fusion. The patient's eye should diverge. The prism is

1656 then removed and the patient's eye should move back toward the nose to again

1657 regain fusion.

1658 3. Re-insert the prism switching from BI to BO while telling the patient to maintain

1659 fusion.

1660 4. Once the patient can smoothly and easily regain fusion without suppression with

1661 the 6 $\Delta$  BI prism, the prism power should be increased to 8 $\Delta$ .

1662 5. The prism powers should gradually be increased as proficiency develops up to

1663 15 $\Delta$  BI and 25 $\Delta$  BO.

1664 Note: The prism powers should only be increased once the patient is able to quickly

1665 and easily regain fusion when alternating between BI and BO for 3-4 minutes. It is

1666 important to build stamina with each prism. Typically patients will only increase by

1667 one or two prism levels in one therapy session.

1668

1669 Coaching:

1670 1. The patient should constantly be reminded to watch for both strings and monitor

1671 for suppression. If suppression occurs, techniques covered in the Brock String

1672 procedure may be used. The patient should also be constantly reminded to

1673 make sure the strings continue to cross through the near bead while performing

1674 this activity.

1675 2. When training BO, the patient should be told to "look close" or "look hard".

1676 When training BI, the patient should be told to "look behind the bead" or "relax".

1677

1678 Goal:

1679 Accurate fusion of the near bead at 30-40 cm while alternately using 15 $\Delta$  BI and

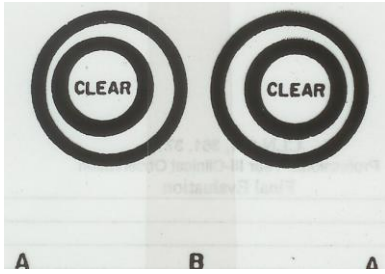
1680 25 $\Delta$  BO prism without suppression

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1685 **Eccentric Circles**

1686 Vergence Therapy Phase 3

1687

1688 Purpose:

1689 Improve convergence and divergence skills

1690

1691 Equipment:

1692 Clear Eccentric Circle Cards

1693 Pointer (optional)

1694

1695 Procedure/Coaching:

1696

1697 Convergence Training (BO)

1698 1. The Eccentric Circles should be held at 40 cm side by side with the **"A's" or "B's"**

1699 **superimposed.**

1700 2. Free space training of BO is not always easy for patients. To help your patient

1701 converge, it is often helpful to use a pointer. Start with the pointer touching the

1702 circles and centered between them. While the patient fixates the pointer, move it

1703 slowly toward her while she is aware of the appearance of the circles in the

1704 background (held at 40cm). She will initially see 4 sets and then 3 as she assumes

1705 the correct vergence posture. Once she is able to appreciate three circles with the

1706 use of the pointer, the patient should "look hard at the center set of rings" and try to

1707 drop the pointer out of view while keeping the circles fused.

1708 3. The patient may need to practice with the pointer until she understands how the

1709 target should look and how her eyes should feel. To encourage her to cross her

1710 eyes on her own, you may have her practice by crossing her eyes all the way to her

1711 nose first. This will be more convergence than she needs and she will see the target

1712 as 4. As she slowly relaxes and diverges, she should be instructed to stop when she

1713 sees the target as 3.

1714 4. When she first learns to appropriately converge, the 3 targets may be blurred. This

1715 means that the accommodation is following the vergence (the patient is over

1716 accommodating). The patient should be coached to maintain the target as 3, but

1717 relax slightly to clear the targets.

1718 5. As proficiency improves, the vergence demand can be increased by increasing the

1719 separation between the targets (moving the eccentric circles apart) or by moving the

1720 target closer to the patient.

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### Divergence Training (BI)

1. The Eccentric Circles should be held at 40 cm, side by side with the "A's" or "B's" superimposed.
2. The patient should fixate on a target across the room. While the patient is looking across the room, slowly "sneak" the target in front of the patient's line of view. While the patient keeps the distant target single, have the patient be aware of the circles. If the foveas are directly aligned with the circles, then the patient will report 3 circles with an appreciation of depth on the center set of rings. If the patient sees four targets, he should slowly move the target toward or away from him slightly until there are 3 targets. The patient usually only has to make a small adjustment to get 3 targets this way.
3. Often when training divergence this way, accommodation will follow the vergence leaving the targets blurry (under accommodation). If the patient notices blur, coach him to keep the circles 3 by keeping his eyes straight but tighten up his focusing (accommodate).
4. If the patient has difficulty appreciating fusion and/or keeping the targets clear while diverging, the therapist may use +2.00 lenses in front of both eyes to assist. Once the patient can appreciate clear fusion with the lenses, they should be removed while the patient keeps 3 circles.
5. As proficiency improves, the vergence demand can be increased by increasing the separation between the targets (moving the eccentric circles apart) or by moving the target closer to the patient.

### Goal:

The ability to perform divergence and convergence fusion while keeping the targets clear. Eccentric circles should be fused with the cards edge-to-edge for divergence fusion and separated by 3-5 cm for convergence fusion.

1770 **Aperture Rule**

1771 Vergence Therapy Phase 3

1772

1773 Purpose:

1774 To help the patient improve the convergence and divergence ability with accurate  
1775 accommodation

1776

1777 Equipment:

1778 1. Aperture Rule instrument including flip-card (AP cards) booklet, and window  
1779 (single slot and double slot).

1780 2. pointer stick (optional)

1781 3.  $\pm 2.00$  flipper (optional)

1782

1783 Procedure:

1784 1. Assemble the Aperture Rule with the AP card booklet placed at "0" on the scale;  
1785 turn to the picture of the two clocks (AP 1).

1786

1787 *Convergence Training*

1788 2. Move the *single aperture* slider so that it is positioned at "1 and 2" on the scale.

1789 3. Place the tip of the patient's nose against the edge of the rule so that the patient  
1790 is looking through the slider window at the card.

1791 4. Have the patient close the right eye and observe that the clock on the left  
1792 disappears. If the patient reports seeing part of a second clock, move the card a  
1793 little closer to them until only one clock is seen.

1794 5. Have the patient close the left eye and observe the clock on the right will  
1795 disappear. If the patient sees part of a second clock, move the card a little closer  
1796 to them until only one clock is seen.

1797 6. The patient should then be instructed to look through the aperture window by  
1798 crossing his eyes and try to see one clock with one set of circles underneath it.  
1799 There should also be a cross above the circles and a dot below them. The targets  
1800 should be clear and single. Remember, the patient must see both the cross and  
1801 the dot at the same time. The circles should appear three dimensional.

1802 7. When the patient is able to see one clock with both the dot and plus sign visible,  
1803 have them look over the flip card into the distance, then back through the  
1804 window slider. They should be able to do this several times, obtaining a clear  
1805 single picture within a few seconds each time they look back to the card.

1806 8. Once the patient is able to look away and look back to regain fusion 10-12 times  
1807 quickly and easily with card number 1, flip the card over to the two parrots (AP  
1808 2). Keep the slider positioned where it is ("1 and 2"). Repeat steps 1 through 8  
1809 above. When the patient is ready to move to the next flip card (Golfer, AP 3) the  
1810 therapist will have to move the slider to position "3" on the scale. The AP cards  
1811 should always be at position "0" while the slider should be placed on the scale  
1812 number that matches the AP card (slider to 4 on scale for AP 4, and so on).

1813 9. Convergence training with the single aperture slider continues until the patient is  
1814 proficient with card number 8.

1815

1816

1817 *Divergence Training*

- 1818 10. The procedure is then repeated to train divergence by using the double aperture  
1819 slider and card number 1 (AP 1). The patient will have to relax and diverge his  
1820 eyes so that his right eye looks through the aperture on the right and the left  
1821 eye looks through the aperture on the left in order to fuse the target. The  
1822 patient must monitor for suppression using the cross and the dot above and  
1823 below the two rings.
- 1824 11. The patient should be asked to fuse the target for several seconds and then look  
1825 away to break fusion and then look back through the aperture to regain fusion.  
1826 The patient should practice this cycle until he is able to quickly and easily regain  
1827 fusion 10-12 times with each card. The patient should work through the card  
1828 sequence continuing to look away and then back to regain fusion. The double  
1829 aperture slider should be placed on the aperture rule number that corresponds to  
1830 the card number.
- 1831 12. If the patient has difficulty fusing divergence, the therapist may introduce +2.00  
1832 lenses in front of both eyes to help the patient relax his eyes. Once the patient  
1833 appreciates fusion with the plus, it should be removed as the patient keeps the  
1834 targets fused.
- 1835 13. Divergence training should continue until the patient is proficient at regaining  
1836 fusion with card number 4.

1837

1838 Coaching:

- 1839 1. When training convergence (with the single aperture window) the patient should  
1840 be coached to "look close" and make the eyes "feel tighter". If the patient can't  
1841 get or keep the targets single, place the red pointer stick (or a pencil tip) at the  
1842 top of the window opening. This will better orient them as to where their eyes  
1843 should be looking.
- 1844 2. If the patient reports that the target is blurry while training convergence, the  
1845 patient is most likely over accommodating (focusing). The therapist should  
1846 instruct the patient to keep his eyes crossed through the aperture window to  
1847 keep the target single but relax his focus slightly to make the target clear.
- 1848 3. When training divergence (with the double aperture window) the patient should  
1849 be coached to "look far away" and "relax his eyes".
- 1850 4. If the patient reports that the target is blurry while training divergence, the  
1851 patient is most likely under accommodating (focusing). The therapist should  
1852 instruct the patient to keep the eyes looking straight to keep the targets single  
1853 but to tighten up his focus slightly to make the target clear.

1854

1855 Goal:

1856 The patient should be able to fuse Card 8 for convergence (BO) training and card  
1857 4 for divergence (BI) training while keeping the targets clear.

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1861 **Appendix**

1862 I. Equipment Summary List

1863 II. Therapy Forms (Examples)

1864 a. Letter Chart

1865 b. Word Rock Card

1866 c. Word Search

1867 d. Face Form

1868 e. Visual Tracing

1869 f. Mazes

1870 g. Fill in the Symbols

1871 h. Symbol Sequence

1872 i. Number Find

1873 j. String Reading

1874

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Activity	Equipment Required	Targets located in workbook
Accommodative Push up	Eye Patch	
	Small Letter Chart	
Loose Lens Bi-Ocular	Loose Trial (-) Lenses	
	8-10/ Prism	
	Large Letter Chart	
Letter Chart	Letter Charts	
	Eye Patch	
Binocular Accom Facility with word search	$\pm 1.00$ - $\pm 2.50$ flippers	
	R/G glasses	
	Bar Reader	
	Word Searches (black)	B/W Workbook
Binocular Accom Facility with word rock	$\pm 1.00$ - $\pm 2.50$ flippers	
	R/G glasses	
	Word Rock Cards	R/G Workbook
Brock String	Brock String	
Red Line Coloring book	Red line book	
	R/G glasses	
Face Form	Red crayons	
	Form 1 (all red)	R/G Workbook
	Form 2 (red and green)	R/G Workbook
	R/G glasses	
Visual Tracing	Stopwatch	
	Visual tracing worksheets	R/G Workbook
Red Crayon Activities	R/G glasses	
	Mazes	B/W Workbook
	Fill in the Symbols	B/W Workbook
	Symbol Sequence	B/W Workbook
	Red Crayons	
Bar Reader	R/G glasses	
	Red/Green Bar Reader	
	Word Searches (black)	B/W Workbook
	Ann Arbor Books	
Anaglyphic Letter Tracking	R/G glasses	
	Sheet Protectors	
	Vis a Vis Pens	
	Number Find Worksheets 1-50	R/G Workbook
Number Find	Number Find Worksheets 1-100	R/G Workbook
	R/G glasses	
	Stopwatch	
String Reading	String Reading Worksheets (r/g)	R/G Workbook
	R/G glasses	
	Stopwatch	
	metronome	
Vis a Vis	Polarized glasses	
Barrel Cards	Barrel Card	
	$\pm 2.00$ Flipper	
Vectogram Vergences	2 Quoit Vectograms	
	Polarized glasses	
	Pointer	
Mini-tranaglyphs	Mini-tranaglyphs	
	R/G glasses	
Brock String with prism	Brock String	
	Loose Prisms	
Eccentric Circles	Eccentric Circles	
	Pointer	
Aperture Rule	Aperture Rule	
	Aperture Rule Book	
	Pointer	

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1878

Letter Chart

<b>F</b>	<b>J</b>	<b>K</b>	<b>T</b>	<b>F</b>	<b>4</b>	<b>I</b>	<b>L</b>	<b>V</b>
<b>U</b>	<b>C</b>	<b>S</b>	<b>B</b>	<b>Y</b>	<b>U</b>	<b>L</b>	<b>E</b>	<b>W</b>
<b>2</b>	<b>N</b>	<b>D</b>	<b>K</b>	<b>L</b>	<b>S</b>	<b>A</b>	<b>C</b>	<b>T</b>
<b>R</b>	<b>W</b>	<b>I</b>	<b>N</b>	<b>B</b>	<b>Y</b>	<b>H</b>	<b>E</b>	<b>X</b>
<b>V</b>	<b>X</b>	<b>L</b>	<b>K</b>	<b>E</b>	<b>W</b>	<b>T</b>	<b>H</b>	<b>J</b>
<b>R</b>	<b>7</b>	<b>Y</b>	<b>O</b>	<b>H</b>	<b>F</b>	<b>D</b>	<b>L</b>	<b>Y</b>
<b>V</b>	<b>G</b>	<b>E</b>	<b>W</b>	<b>A</b>	<b>S</b>	<b>X</b>	<b>Z</b>	<b>3</b>
<b>Y</b>	<b>H</b>	<b>I</b>	<b>O</b>	<b>N</b>	<b>M</b>	<b>P</b>	<b>O</b>	<b>T</b>
<b>K</b>	<b>M</b>	<b>N</b>	<b>B</b>	<b>U</b>	<b>Y</b>	<b>T</b>	<b>E</b>	<b>A</b>
<b>Z</b>	<b>2</b>	<b>R</b>	<b>I</b>	<b>O</b>	<b>N</b>	<b>J</b>	<b>H</b>	<b>K</b>
<b>P</b>	<b>U</b>	<b>E</b>	<b>B</b>	<b>I</b>	<b>O</b>	<b>L</b>	<b>T</b>	<b>V</b>

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Small letter Chart

F J K T F 4 I L V  
U C S B Y U L E W  
2 N D K L S A C T  
R W I N B Y H E X  
V X L K E W T H J  
R 7 Y O H F D L Y  
V G E W A S X Z 3  
Y H I O N M P O T  
K M N B U Y T E A  
Z 2 R I O N J H K  
P U E B I O L T V

1889

1890

1891 Accommodative Rock Card  
 1892 Level 50b  
 1893 Flip the flipper after each word as you follow the directions in the  
 1894 column to the left.  
 1895

Find words starting with C	Clock	Ran	Full	Can	Happy	Sugar	candy
Find the States	Utah	France	Sand	High	Georgia	Texas	Car
Find the animals	Happy	School	Fish	Hop	House	Frog	Worm
Find the body parts	Brown	Fork	Finger	Nose	Floor	Bed	Toe
Find the numbers	Eye	Two	Ten	Warm	One	Pink	Love
Find the insects	Spider	Fish	Dog	Cat	Fly	Ant	plant
Find the food	Taco	Tree	Beans	Apple	Grass	Candy	milk
Find the boy names	Clara	Fluffy	Max	Beth	Brian	Tyler	Ted
Find the bodies of water	Cloud	Ocean	Bug	Milk	River	Lake	Cup
Find the Colors	Bug	Pink	Blue	Pencil	Paper	Red	shirt
Find kitchen things	Food	Oven	Water	Car	Ear	Hop	spoon
Find the months	Peach	April	Wall	Blue	June	Fall	May
Find the vegetables	Bread	Corn	Fish	Pizza	Chicken	Carrot	Potato
Find words ending with d	Room	Bend	Lost	Fred	Clock	Mom	Phone

1896

**American Civil War 2**  
VA Level 50

M K E T E S L F L B G S A Q W L C S U G F T U N N V A U H T  
 S I Y Z A L U C C R O I O R A O I A C C I Y I D W M C Q S V  
 W H G Y N A M M R R R N L I V T D S N L O E L E Y O B F A W P  
 Y Z K V A V W M L I E T P T E G Y E C R T B D K R I I R B M  
 V I V J I E R J G C L J O H N R Y K G O A T T N B E N P W I  
 G B O U S R D R L W I N Q T V F E C A T L L W W S X D Q E I  
 V B U N I Y I M I S S I S S I P P I E D E N F H M E U I P Z  
 T P X D U V T L R M A H S V V L D S G O I U L P J A S E O M  
 H G H E O A W A T L F N Z R Z Z E M Z N A R L H K I T R V F  
 W F T R L C N K Z R M V B K F U R T Q A T H O B T G R L O E  
 A F Q G S F I J L K X M B A Y V D T B X H Y S L K R Y D U Y  
 W W S R C S I K B G E Z B A B R A H A M Y B O V F O K P K J  
 E L N O G A S Q F N O I N U G R D Y P M M X A M S E U B O G  
 Z C T U D I F B F D D W S N J H X E J L H L J I G G A R O E  
 P Y W N F A O P R F N G E C O P L T L Q R G F P D Y I W S N  
 Z Y M D S H B C W A C E U I C S F E R R Y A X Y M G B H Y M  
 E S I M O R P M O C S A J S J K R O P Q A T N N O E E L Y K  
 Z J X Q E H S V T S Y E R I P A B E R Z E T S R A H E D Z Z  
 H R U L Q R Q I E C V K Q O D J L R F X K P F U L N C I E K  
 D R F L E S V N A J V T U D L N A A A F A M R R Q R H S G M  
 H S T P I R N R H A R R I E T I O S B T E E M F C E E N J I  
 T R R V W E E A J Z Q W L N C L N M G A G J G J J H R H C K  
 Y A A W T D R C T A W U O N T V O A H A M R H H Z T C U S B  
 H D E E E Z F V W A A R K A N S A S R C Y A A O Z U Y S X M  
 Z Y D F E F Q G M Q T S R J Q T U D D E I I Z I O O O D U W  
 X R N P H D S K C H H T T F H G N B U Y T R A B D S G H W X  
 S O B O E D E C E S M O S A L G U O D S I M D A O R L I A R  
 C D P R S M J R J P A W M Y M R U U B C H Y U X B G R X J O  
 K W I L Q A N R F H I E F P L M H Y Y Q C Z Q S B K T S D N  
 N D S N N O O Q E M E B L K S U N O I X N R S Z C A T T E V

ABRAHAM  
 ALABAMA  
 ARKANSAS  
 BEAUREGARD  
 BEECHER  
 BLUE  
 BROWN  
 CAROLINA  
 COMPROMISE  
 CONFEDERACY  
 COTTON  
 DAVIS  
 DEBATES  
 DOUGLAS  
 DRED  
 FERRY  
 FLORIDA  
 GEORGIA  
 GREY  
 HARPERS  
 HARRIET

1897  
 1898  
 1899

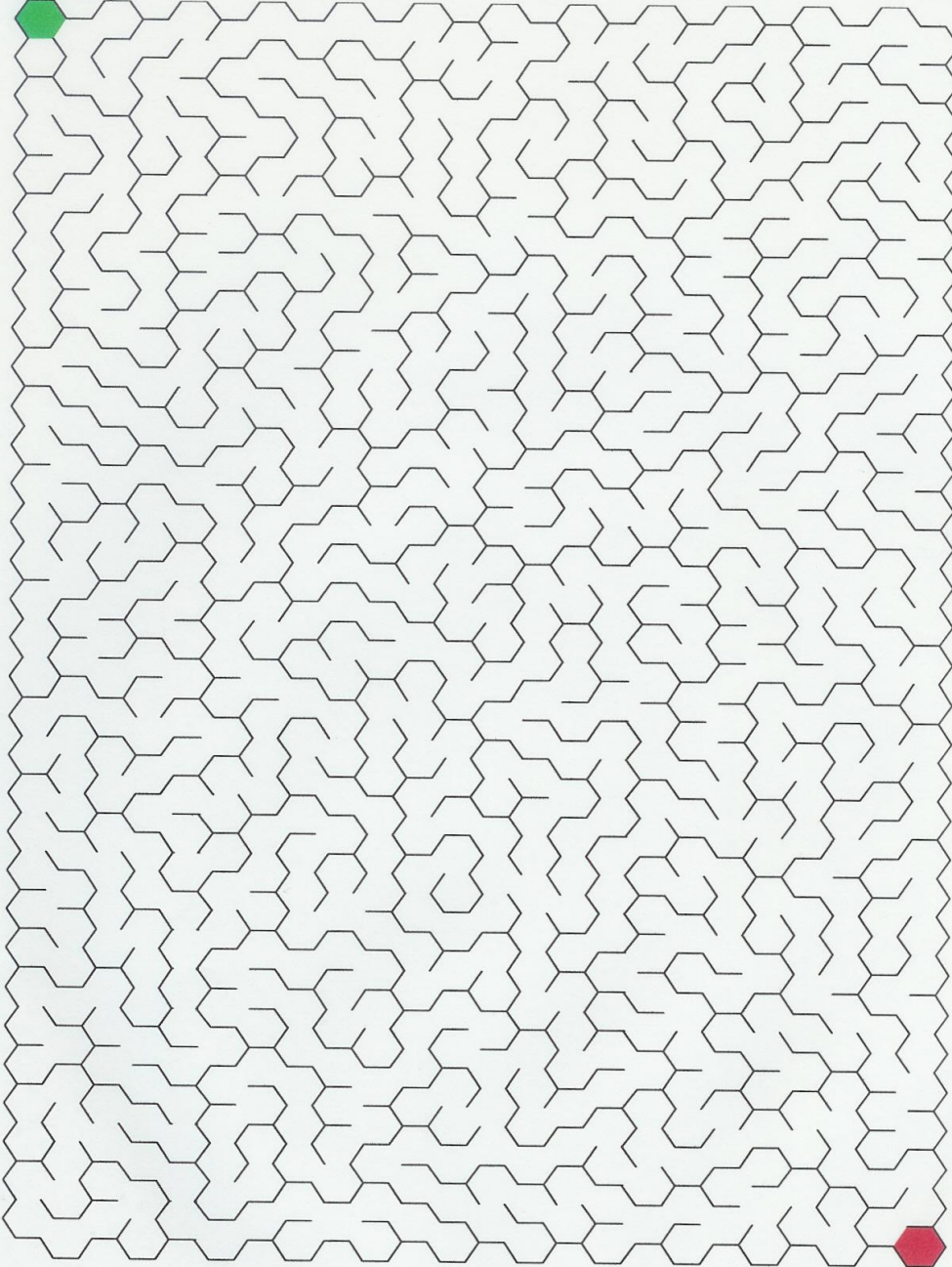
1900  
1901  
1902  
1903

**Face Form** (This example will not work with the Red/Green glasses. You must use the form located in the R/G workbook.)





Maze 22



- 1951
- 1952
- 1953
- 1954
- 1955

1956  
1957  
1958

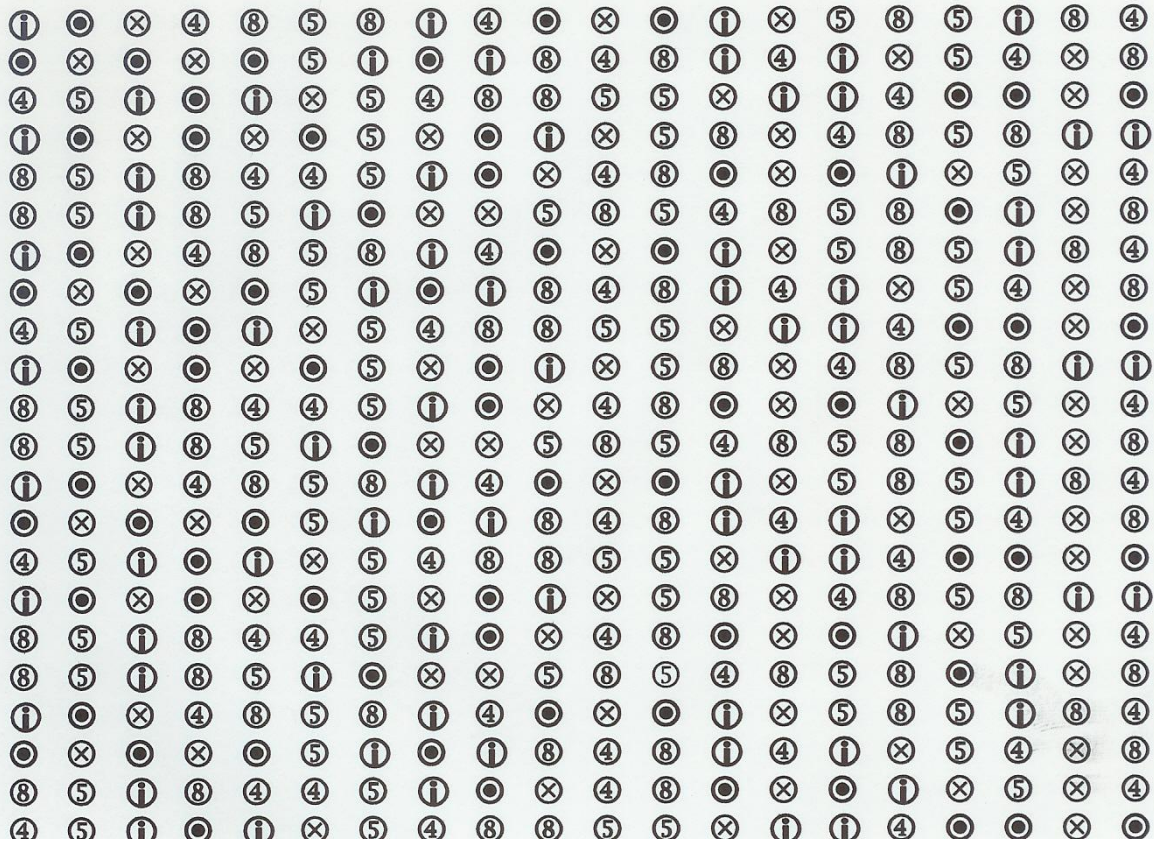
### Fill in the Symbols

#### Fill-in the Symbols

**Instructions:**

1. Using a Red crayon, fill in each symbol.
2. First complete one symbol for the entire page
3. Accuracy is important - stay within the lines

Try to maintain accuracy and gradually increase your speed



1959  
1960

1961  
1962  
1963

### Symbol Sequencing

Vision Therapy Study Level 2.1

Follow this Sequence of Symbols <sup>v3</sup>

⊗ ⑧ ○ ⑨ P ② i ⑩ ● ⑦ i ④ ⊖ ① ③ ⑤ ✓ □ ⑥ ⊗ ⊗

⊗	i	①	⊗	⑩	①	⊗	②	⊗	P	⑨	④	□	●
③	✓	①	i	○	⑦	⑤	⊗	②	⑥	⊖	⊗	⑧	P
○	⑤	●	i	④	□	⊗	③	⊗	①	⑨	⑩	①	⊗
②	⑨	⊖	P	⑧	i	⑤	⊗	②	①	✓	i	□	⑦
○	⑩	⊗	P	⑩	i	⑦	②	①	●	⑥	⊖	⊗	⊗
①	✓	⑧	P	i	⑦	④	□	⊗	③	i	⑨	⑧	i
④	□	⊗	③	⊗	⊗	①	④	□	⊗	③	⑦	④	②
①	✓	○	⑩	⊗	⑥	⊖	③	⑦	⑧	i	⑤	⊗	⑧
P	i	⑤	●	i	④	□	⊗	⑧	⊗	①	⑤	⑩	①
□	⑦	○	⑩	⊗	③	⑩	①	⊗	②	⊗	⑤	⑨	④
□	●	③	✓	①	○	⑦	②	①	✓	○	i	⑩	⊗
⊗	①	④	□	⊗	i	⑦	④	②	①	✓	○	⑩	⊗
⑥	⊖	③	⑦	●	i	④	□	□	i	①	⊗	⑩	①
⊗	②	⊗	P	⑨	□	④	□	□	③	✓	①	i	○
⑦	⑤	⊗	⑧	P	i	⑤	●	⊗	④	✓	①	③	①
①	✓	⑩	①	⊗	③	⊗	①	✓	⑩	□	⊗	③	①

1964

1965  
1966  
1967

**Number Find** (This example will not work with the Red/Green glasses. You must use the form located in the R/G workbook.)

## Number Search

sheet 1

a

Circle the numbers 1 through 50

2	1	9	10	2	3	12	24	46	4	33
55	38	5	78	4	2	6	7	86	53	5
8	11	9	22	7	10	11	72	56	15	12
13	3	67	92	11	14	15	18	43	55	2
41	16	6	37	48	19	79	17	23	18	19
94	82	11	20	31	21	29	34	71	22	23
41	20	84	24	11	25	26	97	35	27	3
22	63	90	28	14	43	29	51	30	14	70
31	50	62	4	23	32	33	41	34	40	35
87	36	20	37	12	52	38	45	81	23	80
4	39	32	40	33	65	6	41	32	42	43
7	31	29	44	27	74	45	46	71	34	7
47	26	48	21	45	72	49	63	50	7	93

1968  
1969

1970 **String Reading** (This example will not work with the Red/Green glasses. You must  
 1971 use the form located in the R/G workbook.)  
 1972

## STRING READING LEVEL 1 OCULAR MOTOR

Directions: Call out aloud only the single letters. Go from left to right.  
 Remember, DO NOT use your finger to keep your place.

AA	B	C	DD	O	K	RR
CC	TT	Y	E	BB	M	W
Q	V	DD	QQ	U	SS	J
XX	H	J	K	GG	A	K
BB	A	OO	L	OO	BB	R
D	FF	T	A	JJ	K	LL
B	OO	JJ	E	NN	EE	A
NN	T	H	AA	N	B	AA
S	KK	I	NN	R	II	N
K	LL	EE	Y	UU	L	YY
WW	S	T	RR	E	BB	E
E	AA	R	MM	I	L	SS
C	YY	I	LL	B	J	UU
DD	I	HH	TT	JJ	A	NN
EE	MM	A	YY	R	TT	O
M	A	EE	X	LL	E	N
FF	R	HH	R	Y	AA	PP

1973  
1974