The Shooting Cookbook:
Shooting Drills
for
Precision Shooting,
Sequence Shooting,
Biathlon and Summer Biathlon

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Sampler

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List of Drills

This alphabetical list of drills is subdivided into Shooting Drills, Biathlon Specific Drills and Decision Drills. The first two categories are further subdivided into Beginning and Advanced drills. The advanced drills are for use by athletes who already have good shooting skills and are aiming for high performance, or for experienced shooters who appear blocked from reaching even higher performance levels. Decision drills are for athletes who have a good foundation in shooting skills.

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Introduction

This is not a typical shooting book. It is a book of drills designed to train particular shooting skills.

The pages are not filled with narrative descriptions of "how to shoot good", exacting discussions of the sport science of shooting or anecdotal stories about Olympic medallists and World Champions to serve as object lessons. This is a book for coaches who have read such books and understand them. It is a book for expert and advanced coaches that may also be used by beginners. The objective of this book is to record and document, in explicit detail, drills for training shooters. It is very much a practical, how to book. It is what its title implies, a book that tells the reader how to do drills that train particular shooting skills.

Following the lead of Heinz Reinkemeier, (*On the Training of Shooters, Vol. 1 & 2*, NSRA, 1992), we believe that the shooting process can be broken down into its component skills and that these component skills can be individually trained. In 1996, we started to look for training drills that would supplement those we already knew about. We did an extensive literature search and came up mostly empty. When this happened, we decided to work on this book. We started collecting drills by writing down the drills that we used with our athletes and by talking to and watching other coaches working on the range. Some of the drills in this book are well known in the shooting community or among biathletes. Most of the other drills came from Nikolay Koterlitzov and some we invented and tested for ourselves as we identified gaps in the book

The drills focus primarily on precision shooting and secondarily on shooting uninterrupted sequences of shots at one or more targets. Although we use prone and standing rifle shooting to illustrate our precision shooting drills, we think that these drills can be easily adapted to other forms of shooting. Similarly, although we use biathlon as the example for sequence shooting, we believe that the drills in this section can be readily adapted and modified by shooters who compete in similar rapid-fire competitions with different rules and different targets. We are convinced that the fundamental skills of shooting are common to all the shooting sports and we have focused our drills in this direction.

Although this is not a book on the theory of shooting, we have included a discussion of the more critical elements of shooting to put the drills in a proper context. For each element, we have described the physical and mental processes involved and then indicated in separate sections, the main mental, physiological and technical influences that should be considered when training that particular element. *See* Elements of Shooting.

Similarly, the Definitions section is not a comprehensive list of shooting terminology, but a short list of terms that are important in the context of the drills. *See* Definitions.

Drills for training to shoot under non-ideal conditions are beyond the scope of this book. In essence, we think that the additional skills needed to shoot under non-ideal

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conditions are essentially coping strategies. The athlete must learn how to cope with the external and internal forces generated by the competition that are conspiring to disrupt his or her shooting skills. Drills for training such skills are a whole different book.

Similarly, coaches will need a thorough grasp of shooting theory and training principles to integrate these drills effectively into their training plans. Assembling the drills into practices or workout plans is also outside the scope of this book. *See* Shooting Resources.

What the drills are

The majority of the drills are directed at teaching athletes to be good precision shooters. The drills can be subdivided further into drills for beginners, advanced shooters and experts, although even experts can sometimes benefit from going back to first principles. The advanced drills are for use by athletes who already have good shooting skills and are aiming for high performance, or for experienced shooters who appear blocked from reaching even higher performance levels. The decision drills are for athletes who already have a good foundation in shooting skills. About 25% of the drills are specific for Biathlon and can be adapted for either the Summer or Winter versions of the sport

We have deliberately designed the printed version of these drills in a cookbook-like format, so that the details of the drill are made explicit. Our goal was to provide explicit instructions for each drill and a clear model for inventing new drills. The instructions serve both as a literal description of what the athletes should do, and as a model that can be used as a guide for development of new drills and practice plans.

In each drill we describe the purpose of the drill in terms of the element of the shooting process which is trained. Then we describe the requirements for the drill: what precursor skills are needed, what aiming point is used and what ammunition is required. The body of the drill is the instructions for the athletes. These describe precisely what the athlete must do and are written like a movie script, in the form of spoken instructions. Like the instructions in a recipe, the instructions tell the athlete exactly what to do with each ingredient in the drill and in the process, explicitly describe the drill for the supervising coach. The latter part of each drill consists of optional parts, which might include variations on the drill; analysis of results; links to shooting theory; comments on the drill that do not fit easily into the instructor dialog.

How to use the drills

The drills can be approached from a number of different angles. We have written the drills so that they can be used by a range of coaches, from experts to beginners. We expect that expert coaches will read the detailed instructions and mine our descriptions for ideas and principles that they can then adapt to their own armory of coaching skills. At the other end of the scale, we expect that beginning coaches and self-coached ath-

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letes will use many of the drills directly as written, gradually adapting them to their own style as they gain experience with coaching and with the drills.

For all of the drills, we indicate for each drill which skills should be learned first before the current drill is used. Some drills follow naturally or more efficiently one after the other within a practice, and where appropriate, this is indicated too.

A few of the drills are derived from a reading of the decision training literature (ref.), in which learning is reinforced by putting the athlete in a decision making situation. This is usually a stressful or competition related simulation, which heightens concentration and/or provides practice in executing real world coping strategies. These drills are experimental and are designed to case-harden composite skills to competition strength.

What the drills do

For many people, shooting practice consists of shooting the required number of shots and adding up the score at the end to se if the shooting has improved; some times unkindly characterized as the "shoot more bullets" school of training. Such holistic training has its advocates. However, it is very outcome oriented and focuses attention on the results of the shooting, rather than on the process. An alternative model for learning complex skills advocates a much more analytical approach, in which the shooting process is broken down into its constituent sub-processes and each of these skills is optimized separately. This is done through a practice, trial, error detection, analysis and correction cycle. This kind of training is very process oriented and is what led us to search for "training drills" in the first instance.

What the drills do is provide a framework for training the individual skills that go into the act of shooting. By describing exercises that isolate particular skills we also provide an opportunity to focus analytical attention on the execution of each skill. This in turn should lead to improvement of the skill level for particular skills as well as for the overall performance.

Most of the drills focus on teaching or practicing one particular part of the overall shooting skill, e.g. trigger control or breathing. Some of the drills focus on a subpart of the shooting process that combines one or more shooting skills, e.g. natural alignment. A smaller number of drills focus on the whole shooting process and some drills are designed as provocations for advanced shooters who are blocked in their development. We have largely left "whole performance" or competition oriented exercises to the reader.

The objective of most of these drills is to teach shooting skills. An additional purpose is to provide practice opportunities that will make the learned skills automatic.

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Principles

Collecting and writing these drills our efforts were guided by the following principles:

- Shooting skills can be taught and improved in a systematic way.
- Where possible, skills or elements of the shooting process should be learned, assessed and improved in isolation, in an environment that focuses on process.
- It is essential that athletes practice the complete skill as soon as possible. Shooting bullets is important for the integration of separate skills into the shooting performance. We also believe that shooting should be continuously monitored and analyzed for ways to improve the elements of the complete performance.
- The emphasis in shooting training should be on the process of shooting, not the outcome. While training, the outcome (where the bullets went) is only important as feedback for improvement.
- The coach should observe and analyze an athletes shooting technique, using external symptoms to deduce possible causes of problems, so that they can bring this to the attention of the athlete and/or prescribe corrective action.
- Athletes should be taught how to analyze their own shooting technique and learn to share their observations with the coach. Many of the symptoms of incorrect or incomplete shooting skills are not readily observable from the outside; observation and introspection on the athlete's part is essential to improvement.
- Automatization of skills requires repetition; much repetition. Repetition makes permanent, so coaches and athletes must make every effort to practice only *correct* procedure.
- It is worth disrupting an established automatization in order to learn a better process that can then be re-automatized at a higher level of performance.
- First, you have to have the motor skills that allow you to shoot a perfect bullet.
- Mental training cannot substitute for mastering the motor skills necessary to an excellent shooting performance.
- Mental training is *vitally* important to shooting 60 perfect bullets in a row, or shooting five-for-five after skiing 5km flat out

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Introduction to the Drills

This alphabetical list of drills is subdivided into Shooting Drills, Biathlon Specific Drills and Decision Drills. The first two categories are further subdivided into Beginning and Advanced drills.

As indicated in the Introduction, the majority of the drills are designed to help athletes learn how to shoot better, with a smaller number of drills designed to help advanced athletes break through to a higher performance plateau.

We have deliberately designed the printed version of these drills in a cookbook-like format, so that the details of the drills are made explicit. Unlike a shooting theory book, our goal was to provide explicit instructions for each drill. Little or no shooting theory is needed to actually use the exercises, although coaches will need a thorough grasp of shooting theory and principles to integrate these drills effectively into their training plans

We anticipate that expert and experienced coaches will read the scripts, extract the main points or principles, and then use these principles to design, modify or enhance their own practices. To fulfill our goal of explicitly describing each drill, we had to write each one down as exactly as possible. We wrote the Instructions as a scripts because this forced us to think about how we would tell someone how to do the drill in sufficient detail that they could not avoid doing the drill correctly. The instructions serve both as a literal description of what the athletes should do, and as a model that can be used as a guide for the development of new drills and practice plans. We also thought that these scripts could serve as examples to beginning coaches, who might start off using them essentially as written, before they developed their own teaching style.

For all of the drills, we indicate which skills should be learned first and/or which drills should be mastered before the current drill is used. Some drills follow naturally or more efficiently one after the other within a practice, and this is indicated too.

The objective of most of these drills is to teach shooting skills and to provide practice opportunities that will automatize the learned skills. By automatize, we mean: drive the skills down below the level of conscious control so that even under high physical or mental stress, the automatic processes will still lead to correct performance. *See* Automatization.

A few of the drills are derived from a reading of the decision training literature **(ref.)**, in which learning is reinforced by putting the athlete in a decision-making situation. This is usually a competition related simulation, which heightens concentration and/or provides practice in executing real world coping strategies.

Each exercise is described in the same way, much as you would expect in a recipe from a cookbook. What the purpose is; what the ingredients are and how to put them together to achieve the purpose:

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Purpose: The goal or training objective for the drill.

Precursor: Drill or drills which should be taught or mastered before this one.

Aiming Point: What kind of aiming point is used

Ammunition: How many rounds, if any and how loaded.

Duration: Approximate time taken by the drill.

Instructions: A script for the coach administering the drill. This is a very detailed description of the drill, written like a movie script. . A coach may take the basic idea from the script and extrapolate other drills or variations from the ones given. The instructions can be used exactly as written or the instructions can be modified by the coach to suit his/her athletes, his/her style or his/her shooting sport. In any case, coaches will need to add there own, characteristic, bridging sentences to the drills. The kinds of phrases like "OK, guys, lets get started" or "Can I have your attention" or "Today we are …." or "What I would like to do next …", etc. that would make the parts of a drill into a more natural sounding dialogue.

Some drills may have one or more additional headings:

Comments: Notes and comments about the drill that don't fit into the other categories.

Variations: Small changes that increase the challenge or make the drill more interesting.

Analysis: Pointers on how to analyze the results of the drill; critical points to watch for; explanations and linkages back to shooting theory.

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Sample Drills

Several example drills follow. There are 98 drills in the full manual.

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Aiming, horizontal control

Purpose: This is a corrective drill for athletes who shoot horizontally distributed (left-to-right) groups. To concentrate on consistently taking the same position and achieving consistent left-right alignment on the target.

Precursor: : Prone or Standing Natural Alignment.

Aiming Point: Vertical black line; 3mm wide for 10m; about 3 cm wide for 50m.

Ammunition: Regular ammunition, no limit.

Duration: No limit.

Instructions: Take up a prone [standing] natural alignment on the black line, so that when you are about 50% breathed out, the vertical line cuts the front sight aperture in half and the line sticks out above and below the inner circle. Taking your time; shooting at your own speed, try to put all the bullets exactly into the line. Concentrate on getting exactly the same left-right alignment for each shot. Use the visual cues of the vertical line and the internal clues from the ground/rifle/body contact points. Pay attention to consistency in the rifle-body contact points, particularly the trigger finger hand, cheek contact and the butt plate position. Pay attention to the trigger finger; the trigger finger should move straight back in line with the barrel. Check your natural alignment and internal checkpoints before each shot.

Comments: Mostly used with beginners, it can also be used as a provocation with jaded, older athletes using thinner lines. Adjust the thickness of the line so that it is thin in relation to the size of the front aperture. For biathletes using a front sight with crossbar inserts, the crossbar should be as thin as possible, so as not to obscure the thickness of the target line.

Analysis: This drill can be used to test for the effectiveness of corrective advice when trying to improve left-right control as it isolates these elements of the aiming process. It can be used to track down the cause of “shifting zeros” in athletes that have a left-right scatter pattern that appears as two groups. Beginning biathletes, shooting successive 5 shot clips when not under physiological stress, sometimes show a left-right zero shift.

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Call-the-Shots

Purpose: To focus the athletes on self diagnosis, so that they know when they have fired a perfect shot, and if not, what was the error.

Precursor: Ability to shoot better than 50% in chosen technique.

Aiming Point: Normal competition target or paper target for biathletes.

Ammunition: No limit; set at 5/10/15/20 according to skill level and ability of athletes to concentrate.

Duration: No time limit.

Instructions: You are going to shoot 5/10/15 bullets, single load. For each shot concentrate on obtaining the perfect sight picture and follow through. After each shot, immediately replay the shot in your mind and then tell me out loud, where the shot went on the target, e.g. dead centre, or 8 ring at 5 o'clock, etc. I will then tell you where the shot landed. We will discuss reasons for discrepancy between your estimate and my observations after the drill. Even if all your shots do not go dead centre, you will have made valuable progress if you can predict where the off-centre bullets go. Now, shoot 5/10/15/ perfect bullets.

Comments: The purpose of this exercise is to encourage athletes to be intensely aware of the sight picture, the recoil and the natural alignment for each shot. When beginning athletes first try this, their estimates are usually guesses. Encourage them to visually replay the moment of shot release before estimating shot position. Also have them check the natural alignment of the aiming point after the shot. Make a conscious effort to be positive or neutral in your comments.

Be very conscientious about encouraging positive self-talk during this exercise.

Variations: Have the athletes work in pairs, taking turns to be the shooter and spotter. This forces the spotter athlete to think about the symptoms of misaligned shots and the corrective behaviour that might help his colleague be both a better predictor and a better shot. Monitor the conversations for positive reinforcement. Redirect negative commentary.

Do the exercise with dry firing, asking the athletes to describe how the sight picture deflects during trigger release as well as any change in the natural alignment.

Analysis: Ask the athletes to focus on the position of the sights immediately before the recoil, during recoil and after the recoil settles out. Was their natural alignment correct? Is it consistent? Direct their attention to the direction and degree of displacement of the recoil during the shot. Is it different for some shots? Are the contact points and pressures, ground/rifle/body, of the internal check consistent? Encourage introspection, visualization and self-analysis in the context of each shot.

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Follow Through, Dry Fire

Purpose: To focus attention on the isolation of the trigger finger and to practice maintaining the aiming point while the bullet moves down the barrel.

Precursor. External Position, Prone/Standing; Internal Position, Prone/Standing; Natural Alignment, Aiming, Breath Control, Trigger Control.

Aiming Point: White paper, competition target.

Ammunition: None.

Duration: 2-4 min. per drill, 20-30 min. total.

Instructions: [Dry firing at home or in the club house]

Lower the light intensity in the room until it is almost dark. Take up a prone (standing) position with the rifle cocked for dry firing. Use the Internal Position check to test for alignment. Using a normal 2-breath breathing pattern, release the shot and hold the aiming position for 2 seconds. As you release the shot, focus your attention on your body. In particular your eyes, head and hands, with particular attention to the trigger hand and arm. There should be no movement other than the trigger finger. After 2 seconds, break your position. Re-build your position, re-cock the rifle and repeat the drill. Continue until time is up.

[Break for discussion of results before trying again]

[When done with the first exercise, bring the lights up to high intensity for the next exercise]..

Take up a prone (standing) position with the rifle cocked for dry firing. Take up a natural alignment on the wall (white paper), using the Internal Position check to test for alignment. Using a normal 2-breath breathing pattern, release the shot and hold the aiming position for 1 second. During that second, focus your attention on the image of the front sight against the white wall. Pay attention to all aspects of the shot release and monitor your body for unnecessary movement during the release and for one second after wards. . After 1 second, break your position. Re-build your position, re-cock the rifle and repeat the drill. Continue until time is up.

[Break for discussion after 4-5 min. depending on the age group and attention span of your athletes. Keep the practice going to reinforce the white paper behaviour].

Take up a prone (standing) position with the rifle cocked for dry firing. Take up a natural alignment on the small dot target, using both the Internal Position check and the target to test for natural alignment. Using a normal 2-breath breathing pattern, release the shot and hold the aiming position for 1 second. During that second, focus your attention on holding the image of the front sight constant around the black dot. Pay attention to all aspects of the shot release and monitor your body for unnecessary movement during the release and for one second after wards. . After 1 second, break

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your position. Re-build your position, re-cock the rifle and repeat the drill. Continue until time is up.

Comments: This exercise forces the athlete to synthesize all of the early stage exercises, internal and external position, aiming, breathing and trigger control. It also forces the athlete to pay analytical attention to his/her own shooting process. It is a good opportunity to begin talking to the athletes about there inner experience of the shooting process.

Progresion: *See* Follow Through, Live Fire drill.

Analysis: *See* Follow Through in this manual.

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Breathing Rhythm, Five Target, Dry Fire

Purpose: To establish a consistent, rhythmic breathing pattern between shots.

Precursor: Breathing Rhythm, Single Target; Traverse Drill, Dry Fire.

Aiming Point: Five dots, five target strip or biathlon target.

Ammunition: None

Duration: 3 min. max for prone, 10 min. max. for standing.

Instructions: Take up a natural alignment on target C. You are going to practice a 2-breath shooting pattern while you traverse across the 5 targets. The breathing is just like the single target drill we did before, but now we add the traverse drill that we did [before, earlier, last week; …].

The breathing pattern will be: breathe in, breathe out, breathe in, breathe out, shoot. On the second out-breath, breathe out about half way so that you are perfectly aligned on the target. As you take the first in-breath of the next shot, traverse to the next target. To start with, you will ignore the bolt and trigger, taking only virtual shots. OK, take up a natural alignment on target C. Ready? Ok, traverse to the first target:

[Say this next part with a calm, regular cadence, like a hypnotist]

[Keep the cadence slow. For beginners, allow 7-8 sec. or more for each sequence.]

[Take your timing from the slowest person in a group by watching his/her chest movement]

Now,

– breathe in, breathe out, breathe in, breathe out, [pause] shoot; next target

- breathe in, breathe out, breathe in, breathe out, [pause] shoot; next target
- breathe in, breathe out, breathe in, breathe out, [pause] shoot; next target
- breathe in, breathe out, breathe in, breathe out, [pause] shoot; next target
- breathe in, breathe out, breathe in, breathe out, [pause] shoot; next target

Hold in position. Breathe normally, and listen.

[Give positive feedback: “This is good"; "well done”, etc.; personalize the script]

Now we will add in the trigger. As you breathe out the first breath, you will take up the first stage of the .trigger and hold there while you breathe in. On the second breath out, you will take up the second stage to 90% of release pressure and imagine taking the shot immediately the sight picture is perfect.

OK, take up a natural alignment on target C. Now, another 5 trials, this time coordinating the trigger actions and imagining the shot. Starting with the first target:

- breathe in, breathe out, 1st stage, in, out, 2nd stage, [pause] shoot, traverse.

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- breathe in, breathe out, breathe in, breathe out, shoot, fully imagine the shot.
- breathe in, breathe out, breathe in, breathe out, shoot, etc.

[Do this for at least 3 sets of 5; give athletes a break after 3 min. if the drill is prone]

[Work encouragement into the patter, between sets of 5 shots. Especially reinforce good concentration].

Hold in position. Breathe normally, and listen.

[Back to light and airy, upbeat tone]

Next, we are going to progress to dry firing. When you take up your natural alignment, cock the rifle for dry firing. As you breathe out the first breath, you will take up the first stage of the trigger. On the second out-breath you will take up the second stage to 90% and continue to breathe out. Take the shot immediately the sight picture is perfect. Try to synchronize a perfect sight picture with the "shoot" instruction.

Ready? OK, take up a natural alignment on target C. Now, another 5 trials, this time reloading and dry firing the shot.

[Back to hypnotism]

- breathe in, breathe out, 1st stage, breathe in, breathe out, 2nd stage, [pause] shoot.
- breathe in, breathe out, 1st stage, breathe in, breathe out, 2nd stage, [pause] shoot.
- etc.

Comments: It is very important that you keep a regular, steady, rhythmic cadence when doing this drill to reinforce the principle that all shots are the same. One inevitably follows after the other. Forcing the athletes to control their breathing in this manner is very calming and conducive to good mental focus. You can use this as a learning tool, as a warm up to live fire breathing rhythm drills and as a refresher for athletes who have lost confidence or to calm a group that has lost focus.

Variations: For more advanced athletes, you can do this with 1 breath per shot cycles for standing. Also for more advanced athletes, the middle section of this exercise can be used as a basis for focus and visualization training.

Progression: Start the breathing rhythm on target C. Traverse from target C to the first target on an out breath, usually the 2nd out-breath. Progress to live fire once the breathe-and-traverse sequence is established with dry firing. (*See also* Anchoring).

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Combo Drills – Physiological Stress

Purpose: To practice biathlon shooting under physiological stress as part of the progression towards shooting under race conditions.

Precursor: Prone or Standing 5 shot drills.

Aiming Point: Metal target.

Ammunition: 5 bullets per magazine.

Duration: 15 – 20 min..

Instructions: Do the following physical exercise [substitute one of more of the physiological loads described below], go directly to the shooting mat with the rifle on your back, shoot five rounds and leave the mat as quickly as possible. Recover before the next trial.

Our goal for this practice is [number of seconds to first shot], with [realistic number of hits] in [realistic number of seconds overall.]. We will do [2-4] combos before taking a break.

Rest until your heart rate and breathing have returned to normal before attempting a second combo.

[Monitor the drills and get the athletes to talk to you about how it felt in between drills.

Comments: Goals must be set for each practice and should be appropriate to the training stage of the athlete. The dismount, remount and shooting part of the combo is done with full simulation and concentration on all parts of the process.

Recovery after each combo is essential for progress. Reloading presents an opportunity for a longer break every 4 combos.

Variations: In these beginning combos it is important that the athlete remain mentally fresh and not build up excess lactic acid. The physiological stress should be transient, existing immediately prior to and during the 5 shot sequence.

Dry land: Used before snow is available and as part of dry firing sessions. Almost any kind of dry land training for cross-country skiing that will induce temporary fatigue can be used. Do normal physical warm up before starting the exercises. Here are some examples:

Running Intervals: Goal is to elevate heart and breathing rate. 1 – 2 min. intervals, heart rate in Zone 3 (85 – 90% max HR), such that breathing is difficult to control. Emphasis is on recovery from high heart rate and gaining conscious control of breathing during the shooting process (not on interval training!). 2 – 2.5 times interval time for rest (including shooting time). Any variation of dry land intervals for cross-country ski training, including hill bounding, with and without poles. Poles add arm stress to the running interval. Rifle should be mounted as quickly as possible at the end of the interval.

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Upper body strength intervals: Goal is to induce temporary fatigue in the arm and shoulder muscles before shooting. 1 – 2 min. intervals, Use a variety of exercises.

Pushup positions – hands in, out, front, etc. Do the exercise with 'snap', as in pliometrics. Do the exercise until it becomes difficult, but not to failure, and go immediately to the shooting mat.

Chin ups or endurance level free weight exercises can be used as an alternate stress for the upper body.

Pulleys, shock cords or rubber tubing can be used to simulate double poling under load as another form of upper body strength interval. Rifle on back for double poling.

If available, a roller board can be used to do strength intervals here too. Set the slope so that the intervals induce physiological stress but not excessive fatigue.

Lower body strength Intervals: Goal is to induce temporary fatigue in the lower body muscles before shooting. 1 – 2 min. interval, sufficient to temporarily tire the major muscle groups of the legs.

For strength fatigue without a raised breathing rate, wall squats (with thighs horizontal) are good. . Jump squats (with or without rifle) are a good exercise that fatigues legs and raises breathing rate.

Full sit ups, using legs, or sit ups on an inclined bench can also be used.

On snow: This is a full scale dress rehearsal, on skis, with poles, in the range. Tailor the interval load to the athlete and the phase in the training plan. Almost any kind of interval training for cross-country skiing that will induce temporary fatigue can be used. Some examples:

Skate ski intervals: 1-2 min., Zone 3 (85-90% of max HR) with 2-2.5 times the interval time for recovery (including shooting time). Use the normal entrance and exit to/from the range. Avoid skiing the penalty loop for psychological reasons. If the shortest loop available is 1.25km, have the athletes use the first 30-40% of the loop for active recovery between intervals. Sprint the last 1-2 min. into the range. Athletes can practice the approach into the range and the exit out of the range, as well as the shooting sequence.

Skate ski speed intervals: These short, very fast intervals will raise the breathing rate temporarily and are designed to activate the body and mind to race intensity. . Do these intervals with the rifle on.

Load all 4 magazines before you start. Do a good long warm up ski before this session, 20-30 min. Do one 1-2 min. interval towards the end of the warm up. Go straight into the combo drills: 10 – 15 sec. flat out just before the entrance to the range. Perfect dress rehearsal of the approach and shooting sequence. Take 20 – 30 sec. active recovery after each shooting. When you stop to reload, take a 50-60 sec. active recovery break before starting the next series of four combos.

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This style of combo can be used as an energizer close to race day as well as for learning.

Analysis: It is important to use only temporary fatigue when first starting combo drills. The athlete must remain mentally fresh enough to learn from the trials.

Although there will be physiological benefit from these trials, avoid the temptation to sneak your physical training in here. The emphasis here must be on perfecting the shooting performance under controlled stress.

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Computer Games

Three comuter games are distributed on the CDROM version of the shooting Cookbook.

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Accuracy (Biathlon simulation)

Purpose: To improve speed and concentration through improvement in the sight picture - trigger pull reflex and shooting rhythm using a simulated biathlon environment.

Precursor: Aiming and Attack drills.

Aiming Point: Simulated Biathlon target.

Ammunition: Five shots per trial.

Duration: No time limit.

Instructions: To start a trial, select a level of difficulty from either the prone or standing levels.(1 - 4). Move the mouse cursor over the target and then align the sight picture with a target. Click the left mouse button to shoot. You can only shoot once at each target. The timer stops after five shots.

At higher levels of difficulty, the cursor will wobble more, giving you less time to align the shot. Also, higher levels of difficulty require a hit closer to the centre (X=0, Y=0). At the highest level of standing, the target size is the same as in prone.

Comments: After each trial, review the results of your shooting, working towards greater accuracy, as reorded by the X,Y corrdinates for each shot and then greater speed as recorded by the elapsed time.

The purpose of this drill is to train your eyes and trigger finger to recognise the perfect sight picture and shoot it reflexively. A secondary purpose is to train your ability to concentrate on the sight picture to the exclusion of other distractions.

Progression: Race against other members of your shooting club.

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Concentration Grid

Purpose: To improve the ability to concentrate (on a difficult task).

Precursor: None.

Aiming Point: A set of sequential numbers arranged randomly in a grid.

Ammunition: Unlimited shots per trial.

Duration: No time limit.

Instructions: The goal in this game is to find(left click) the sequential numbers in numerical order, from the lowest number to the highest, and to do this as fast as possible. The current number is displayed above the grid.

At low levels of difficulty, there are fewer numbers in the grid and the numbers disappear when clicked in the correct sequence. At the highest level of difficulty, there are 64 numbers and the numbers remain in the grid at all times.

Select a level of difficulty before you start.

Comments: Select an easy level first, to see how the game works. Work on speed first, difficulty second. Any time less than 5 minutes on the highest level shows greater than average ability to concentrate. Times less than 4 minutes are excellent.

Progression: Race against other members of your shooting club.

24	38	25	39
32	27	28	35
34	36	26	33
31	29	37	30

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Speed Grid

Purpose: To improve speed and concentration through improvement in the sight picture - trigger pull reflex in a non-standard target environment.

Precursor: Aiming and Attack drills.

Aiming Point: Simulated targets in an 8 x 8 grid.

Ammunition: Unlimited shots per trial.

Duration: One minute time limit.

Instructions: The two red arrows point to a cell in the grid; this is the active target. To start the game, first select one of the directions: Row, Column, Diagonal or Random. Next, select a level of difficulty (1 - 5). Click on the Start button.

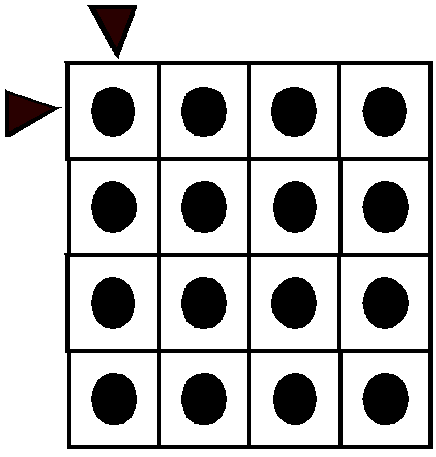
The arrows will move and point to a particular cell in the grid. Move the mouse over this cell and shoot the target by aligning the sight picture and clicking the left button. If you miss a target while shooting Rows, Columns or Diagonal, the arrows will come back to the missed target on the next cycle. The trial ends when you have hit all of the targets or the timer runs down.

At higher levels of difficulty, the arrows move more quickly, giving you less time to align the shot. Also, higher levels of difficulty require a hit closer to the centre (X=0, Y=0).

Comments: After each trial, review the results of your shooting, working towards greater speed as recorded by the elapsed time and greater difficulty, e.g. Random >> Column. Work on speed first, difficulty second.

The purpose of this drill is to train your eyes and trigger finger to recognise the perfect sight picture and shoot it reflexively. A secondary purpose is to train your ability to concentrate on the sight picture to the exclusion of other ditractions.

Progression: Race against other members of your shooting club.



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