The Effectiveness of the Glenmore Lodge Minimal Transceiver, Shovel and Probe Companion Rescue Training

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Introduction

Glenmore Lodge has been trialling the deployment of transceiver shovel and probe (TSP) to winter course participants for the previous three winter seasons (2014-2016). As part of the trial a minimal training protocol was adopted for teaching clients companion rescue. This procedure was originally developed through field testing by Genswein[1] and was considered adequate for clients to be effective in rescuing their guide. However, Genswein tested the effectiveness of his procedure using a short rescue scenario on the same day as training. At Glenmore Lodge our courses last up to six days, therefore we wanted to determine the effectiveness of our process towards the end of a course.

To do this we measured the performance of groups in a simple field scenario similar to that of Genswein. The only Glenmore Lodge groups that are guaranteed to receive the minimal TSP training are those on National Governing Body (NGB) courses. On these courses the syllabus is dictated by the NGB and does not contain any requirement for companion rescues with TSP. Therefore Winter Mountain Leader (WML) training candidates were selected for the formal field scenarios. In addition winter skills groups that only received the minimum training have also been included.

Training and Testing Protocols

Five WML training courses and three winter skills courses participated in the field scenario. These groups received the Glenmore Lodge minimal training on the morning of day one of their courses and were unaware that they would participate in a field trial 5 days later. The WML trainees were tested in a field scenario in 9 separate groups with a total of 53 participants. The winter skills groups were tested in 4 separate groups with a total of 21 participants. Thirteen groups and 74 students in total participated in the field scenarios. All participants had either no prior training or were novices.

Minimal Training Process

The procedure in shaded boxes below describes Glenmore Lodge's minimal training procedure (Table 1). The information in this section was mandatory and was performed in approximately 15 minutes but is imbedded in a slightly longer session. Most instructors delivered the additional information not highlighted in shaded boxes; however this information was not included in Gensweins minimum. The additional information provided was details for looking after the TSP throughout the week and did not concern companion rescue. This extra information plus the time taken to move a group from the building to the training area would usually take a maximum of 30 minutes in total. The training occurred in the grounds of Glenmore Lodge where there is a transceiver park. In addition the training was also delivered on the lawn using transceivers in plastic bottles, with or without snow.

Table 1. Glenmore Lodge Minimal TSP Training Protocol

Organise

- Watch? Last seen point?
- Assign a leader
- Safety, proceed or not based on context
- Delegate roles – searchers, probers, diggers, help?
- Outside assistance? Shout, phone, context?
- Switch all transceivers to search. Physical check?

Demo Signal Search
- Basic principles, transmit or receive, time is life
- Switch transceivers on, search, off until routine established.
- Describe signal search options. Single versus multiple rescuers. 40 meter x 20 meter.
- Run demo signal search with everyone in search mode.
- Look for surface clues

Coarse Search
- From 35 meters continue demo, run to 10 meters then walk
- Follow the arrow and reduce the distance
- No requirement to mention flux lines but set up for a non-linear approach to focus attention on direction indication

Fine Search
- Continue demo, walk to 5 meters
- Transition to crawl, transceiver at snow surface (land the plane)
- Maintain alignment to lowest distance
- Confirm lowest distance by bracketing while maintaining transceiver orientation
- Mark spot for the start of probe search

Client Practice
- Move group(s) (might be better to split group) to a location beyond a signal
- Let them practice, signal, course and fine search

Pinpoint (Probes and Probing)
- Probes, materials, lengths
- Demo assembly and disassemble
- Group practice, assemble/disassemble until routine
- Probing – What are you looking for, spongy resistance
- Probing – 90 degrees to slope
- Probing – 25cm gap in concentric circles
- Continue until strike then leave probe in place

Dig
- Intro, slowest part of rescue, need for organisation and technique
- Shovels, materials, size, packing
- Demo assembly and disassemble
- Group practice, assemble and disassemble until routine
- Explain where to dig dependent on burial depth (reasons)
- < 1m go direct, > 1m start 1.5x depth downhill
- Organise diggers into V shaped conveyor
- Demo technique, chopping and blocking, moving debris on knees
- Run digging for 3-4 minutes. Rotate on command

First Aid

- What to do when approaching casualty
- Take care, expose face, try to identify air pocket/airway
- Assess airway, stabilise ABC
- Leave in hole?

Companion Rescue Scenarios

The WML trainees were tested 5 days after initial training, at their snow hole sites on the second day of an expedition. This location was used to have minimal impact on the training course itself and use the consolidated debris created from digging snow holes. The protocol for setting up the scenario is shown below:

Scenario Protocol
1. The group was briefed about the trial and the scenario.
2. When more than one group was being tested the non-participating group were kept out of sight in their snow holes.
3. A burial site was selected at the snow hole site as close to mid slope and mid debris as possible.
4. An expedition rucksack containing a transmitting transceiver was buried on its side **1 meter** below the surface of the debris.
5. The bottom edge of the search area was marked with probes, axes, shovels etc., 50 meters from the snow hole debris. If necessary the snow was tracked and disturbed to create a relatively uniform search area.
6. The participants were split into groups with a **minimum of 3, maximum of 6** rescuers in each.
7. The participants were packed for a journey **without shovel or probes assembled.**
8. The start position for the scenario was **50 meters downhill** or adjacent **to the lower boundary of the search site that was marked with a probe, shovel, axe etc**. The start was opposite either the extreme left or right corner of the debris dependent on lie of the terrain with the rescuers searching up hill.
9. The boundary of the exercise/avalanche debris was indicated to the group and **the end of the scenario was given as exposure of the rucksack lid** (head/face of the victim).
10. The scenario was started and a stop watch used to measure the time to milestones on a standard checklist.
11. Once the exercise was completed the first group re-buried the rucksack in the same location, depth and orientation.
12. The second group performed the scenario as above.

The winter skills groups were not tested at snow hole sites but the scenarios were set up to be as similar as possible in scale and dimensions. A rucksack and transmitting transceiver was buried to 1 meter depth, the search area tracked and defined and the start position of the group was 50 meters from the search area.

Recording the Scenario Performance

A standard checklist was provided for recording the scenarios. Instructors were trained in its use and practice scenarios were used in parallel to determine the ability of instructors to record accurate timings. The checklist that was supplied is shown in Table 2 below:

Organise	X	Time to start search
• Assign a leader		
• Assess safety		
• Delegate roles – Help?		
• Turn all Transceivers to search		
• Do a physical check		
• Start a signal search		

Signal Search - Run	X	Time to signal
• 40 meter search strip		
• Look for surface clues		
• Follow the arrow, reduce distance		

Coarse Search – Run then Walk	X	Time to crawl
• Run to 10 meters		
• Walk to 5 meters		
• Lower transceiver to snow surface		

Fine Search - Crawl from 5 meters	X	Time to probe
• Keep alignment to lowest number		
• Bracket to confirm lowest number		
• Probe at lowest number		

Pinpoint	X	Time to strike
• Probe with 25cm spacing		
• Upon strike leave in place		

Dig – Fast as possible	X	Time to exposure
• Burial 1meter or less, go direct		
• Rotate frequently		
• Take care approaching casualty		
• Exposure of "casualties airway" (rucksack lid)		

Table 2. The small boxes adjacent to the scenario tasks were intended to identify what actions were performed by the group and were marked with an X when performed. The large box on the right was where the time to the phase milestone was recorded.

An example of how the checklist was completed is given below:

Organise	X	Time to start search
• Assign a leader	x	
• Assess safety		
• Delegate roles – Help?	x	2:45
• Turn all Transceivers to search	x	
• Do a physical check		
• Start a signal search	x	

The timing milestones were defined as:

- **Time to start search:** The time taken for the first person to **start a signal search**
- **Time to Signal:** Total time taken from exercise start to **obtain the first signal**
- **Time to Crawl:** Total time taken from exercise start to **lowering the transceiver towards the snow surface**
- **Time to Probe:** Total time taken from exercise start to the **first probe**
- **Time to Strike:** Total time taken from exercise start to probe **strike of the buried rucksack**
- **Time to Exposure:** Total time taken from exercise start to **exposure of the rucksack lid**
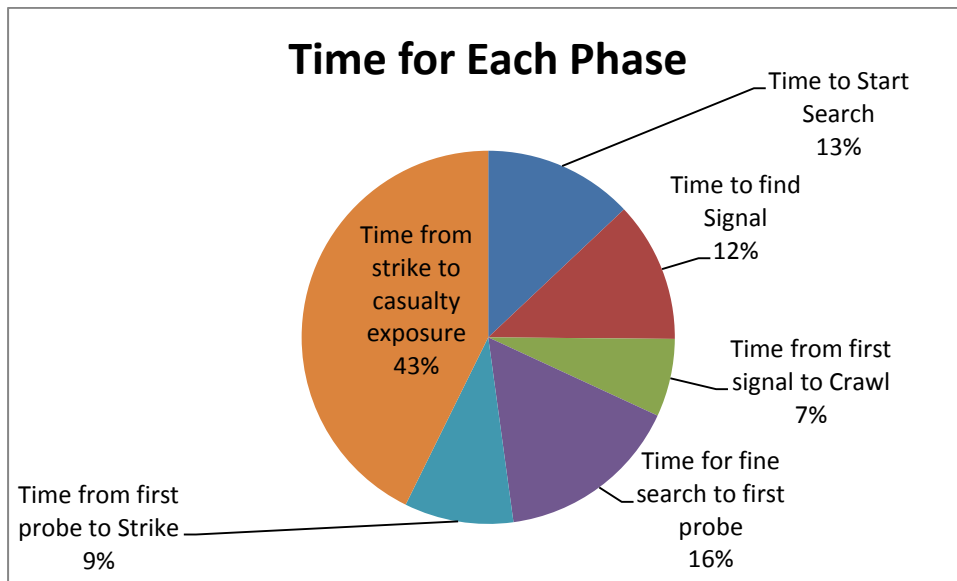
Results

Table 3 shows the average time for all groups to reach the timing milestones.
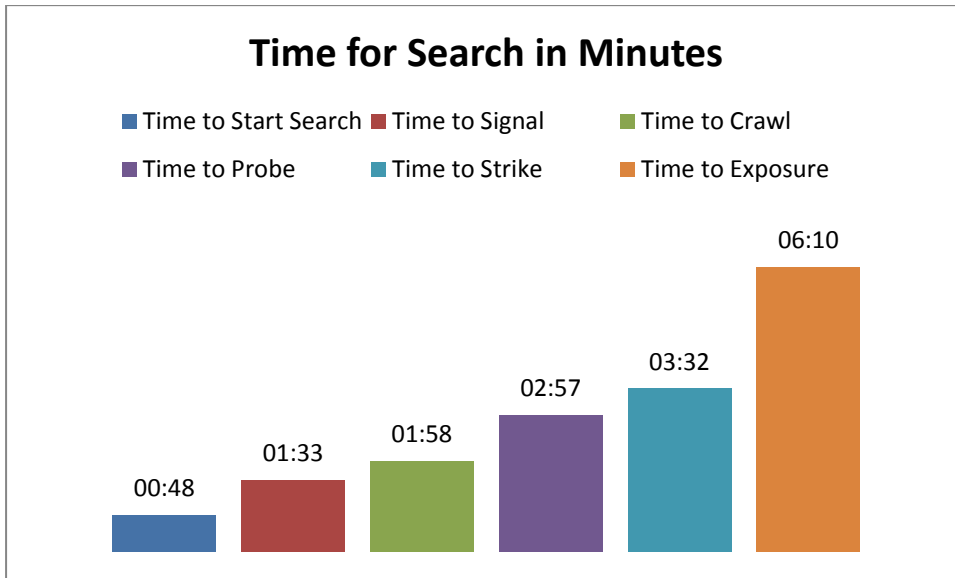
Table 3. The average time taken for the groups to expose the "casualties face" was 6 min 10 secs. The slowest time taken was 9 min 45 secs and the fastest time 2 min 45 secs.

Table 4 shows the proportion of the total time spent on each phase.

Table 4. The longest phase of the rescue was from a probe strike to digging out the "casualties face" which accounted for 43% of the total time taken.

Conclusions

Glenmore Lodge uses a minimal training protocol similar to and developed from that of Genswein. The effectiveness of our training was unknown; therefore we conducted field scenarios with groups that had received the minimal training 5 days earlier. The quicker companion rescue can be performed the less likely the victim will suffer asphyxiation. From this point of view the quicker the better. It has been determined that after 10 minutes of burial in a maritime snowpack survival chances diminish quickly[2]. We therefore considered 10 minutes as a benchmark time for a potentially effective companion rescue. In our field tests we achieved an average of 6min10secs therefore can conclude that our minimal training is effective up to 5 days.

Unsurprisingly the slowest part of our scenario performances was during the digging phase. This suggests that quality time spent on this part of the training may have the biggest impact on performance. To this end perhaps delaying our probing and digging training until we have useful snow may have benefit. The biggest influence on scenario performance is likely to be the snow density and the resultant affect on digging. All the scenarios were performed in a dense maritime snowpack. Although avalanche debris is highly variable it is possible that it could be harder than the snow used for the scenarios. This would therefore slow this phase of the rescue further. In the context of the Glenmore Lodge trial and normal course function it was not practical to set up scenarios to address this.

References

1. **Genswein, M.** (2010) Will a Guest Ever be Able to Save Your Life? **The Avalanche Review**. **29(1), 18-19.**

2. **Haegeli, P., Falk, M., Brugger, H., Etter, H.-J., & Boyd, J.** (2011). Comparison of avalanche survival patterns in Canada and Switzerland. **Canadian Medical Association Journal, 183(7), 789-795.**