

Companion Rescue: Beyond the basics

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Background

This presentation was put together as part of the 2014 ESAW Continuing Education Series. This version was adapted for sharing with those who could not attend. **When appropriate, I have added my talking points for slides in red text somewhere on the slide.**

The topic was chosen based on my belief that snow enthusiasts often focus their limited practice time and attention on only a small part of avalanche rescue. My goals are to help round out the companion rescue skills of backcountry travelers, to provoke some self-reflection on one's rescue skills, and ultimately to further the idea that successful companion rescue is a demanding and stressful event that requires a wide range of skills and abilities. But remember, even the most skillful rescuer relies heavily on luck for a good outcome. Practice as if it were the real thing whenever possible. Develop good habits and practice your way out of bad ones. And finally, don't let your ego get in the way of improving your rescue skills. Everyone can always improve in one way or another. Everyone.

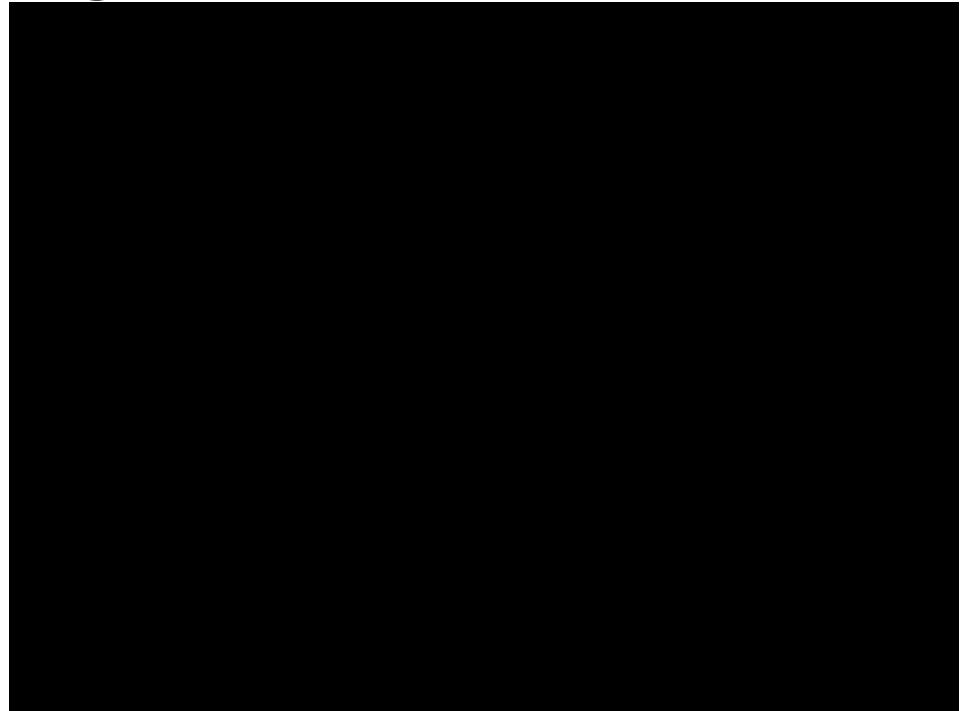
Avalanche Rescue is more than finding someone with a beacon!

Too frequently, I see people get all excited about a new beacon or practicing with their beacons. This is good, but it needs more context. Often, beacon practice is done in shallow snow with simple scenarios. Locating a victim is very important, but it goes beyond simply getting the smallest number on your transceiver.

There's really not much to it...

1. Being prepared
2. Watching it happen
3. Locating & excavating
4. First Aid
5. Evacuation
6. Post the POV
on YouTube

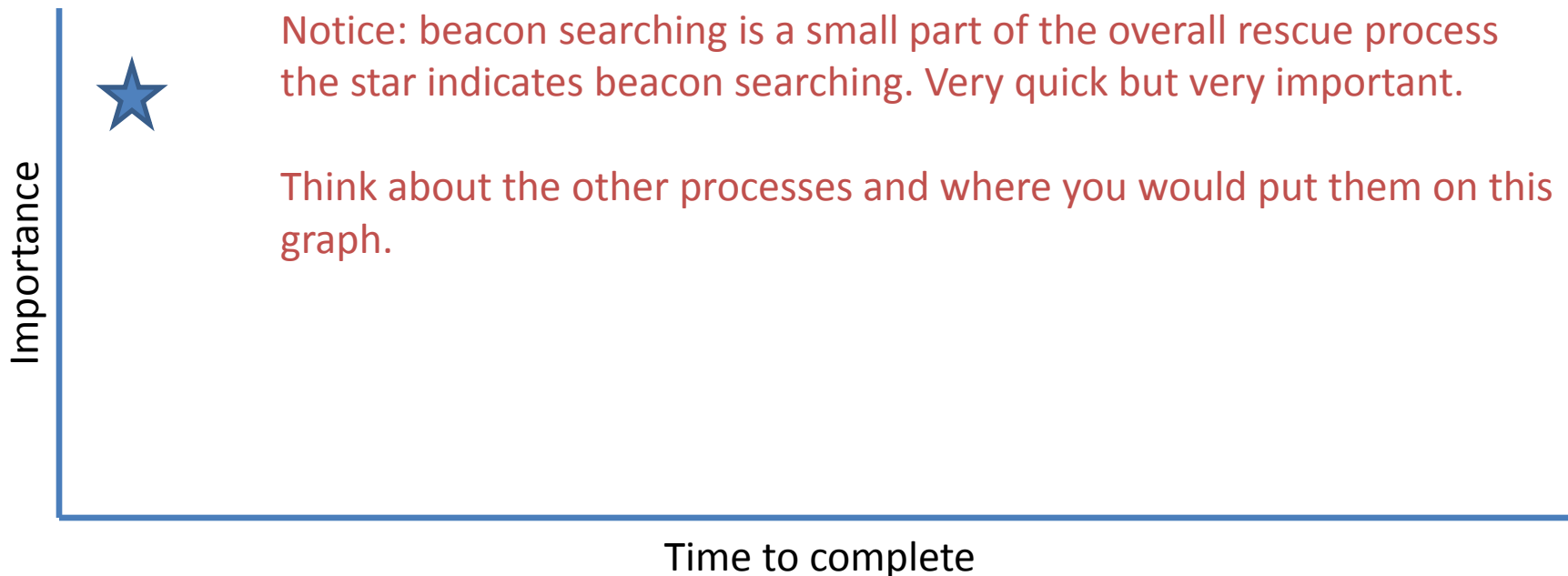
[YouTube video ->](#)



...but yet people still screw it up

- Incomplete avalanche rescue gear kits
- Poor communication
- Lack of contingency plans
- No first aid kit
- Overlooking visual clues
- Excessive time to locate victim
- Digging down on top of victim from above
- Not able to call for help
- Not knowing exact location

Avalanche Rescue



Prepare before you go

- Rescue gear
 - Protective: helmet, airbag, avalung
 - Locating: Beacon, Shovel, Probe
 - Medical
 - Bivy gear?
 - Batteries: beacon, cell, GPS, headlamp, etc.
- Group dynamics
 - Personal motivation & goals
 - Communication styles
 - Risk tolerance (avoidance)

Successful rescue starts long before the avalanche is triggered.

Prepare before you go

- Contingency Planning
 - Who has what gear?
 - Vehicle keys?
 - First Aid?
 - Best routes out?
 - Communications
 - Internal to group
 - External to group

In the avalanche

- Victim
 - Get out to the side or above
 - Ditch skis/board if possible
 - Swim Swim Swim
 - Create an air pocket
- Witnesses
 - Identify last seen area
 - Keep calm
 - Call 911 if possible

Immediately after

(this is where it starts to get interesting)

- Can you see or hear the victim?
- How many victims?
- 911?
- Taking action
 - Visual and audible searching
 - Group beacons—search? rescue send? off?!?
- Can you safely get there?

In an event where someone is buried shallow, they might be able to hear you coming and may even be able to respond. Don't forget to listen as you search!

In a multiple burial event, getting an accurate count of people caught and/or buried is important. The safe travel ritual of exposing one person at a time to the risk will help keep the chaos to a minimum.

Visual & Audible Searching

- If the person is not 100% buried, you don't need to use your beacon!
- Look for clues—check them, but leave them in place
- Keep your gear with you
- Listen—if buried shallow, victim may hear you and try to respond

Again, beacon searching is an important part of avalanche rescue, but's only necessary some of the time. More reason to give thought to the other aspects of avalanche rescue.

Keeping your gear with you helps keep a debris pile orderly, which avoid unnecessary confusion. It also means you will always have your rescue gear at hand.

Beacon Searching

- Signal Search
- Coarse search
- Fine search
- Pinpoint

Common Language

This is the international standard for search phases. When we talk about searches, let's use this language to avoid confusion.

Pinpointing = probing to find the exact location of the victim.

Beacon Searching

- Not looking around
- Uneven search strips
- Pinpoint reorientation
- Too many beacon searchers
- Non-victims in transmit mode



Common
Errors

How many people is enough for a beacon search will depend heavily on the number of victims and the size of the debris pile. Not everyone needs to be involved with the beacon search.

Search Strips

- ICAR—*"about equal to 1.4 (± 0.1) times the realistic maximum range"*
- AIARE—30 meters
- Genswein & Schwiezer 2008—optimal search strip width is *"about equal to the maximum search strip width"*

A good way to think about search strip width—how narrow must a debris pile be in order for me to only need to do one path straight down the middle of the pile? The distance from me to the edge should be half the search strip width.

Search Strip Widths			
Transceiver	Measured Range	Search Strip Calculated	Search Strip Published
Tracker DTS	33	46	40
Ortovox 3+	34	48	40
Tracker2	38	53	50
Pieps (original) DSP	45	63	50
Mammut Pulse	53	74	50
Ortovox S1	60	84	50

(www.beaconreviews.com)

Multiple Burials

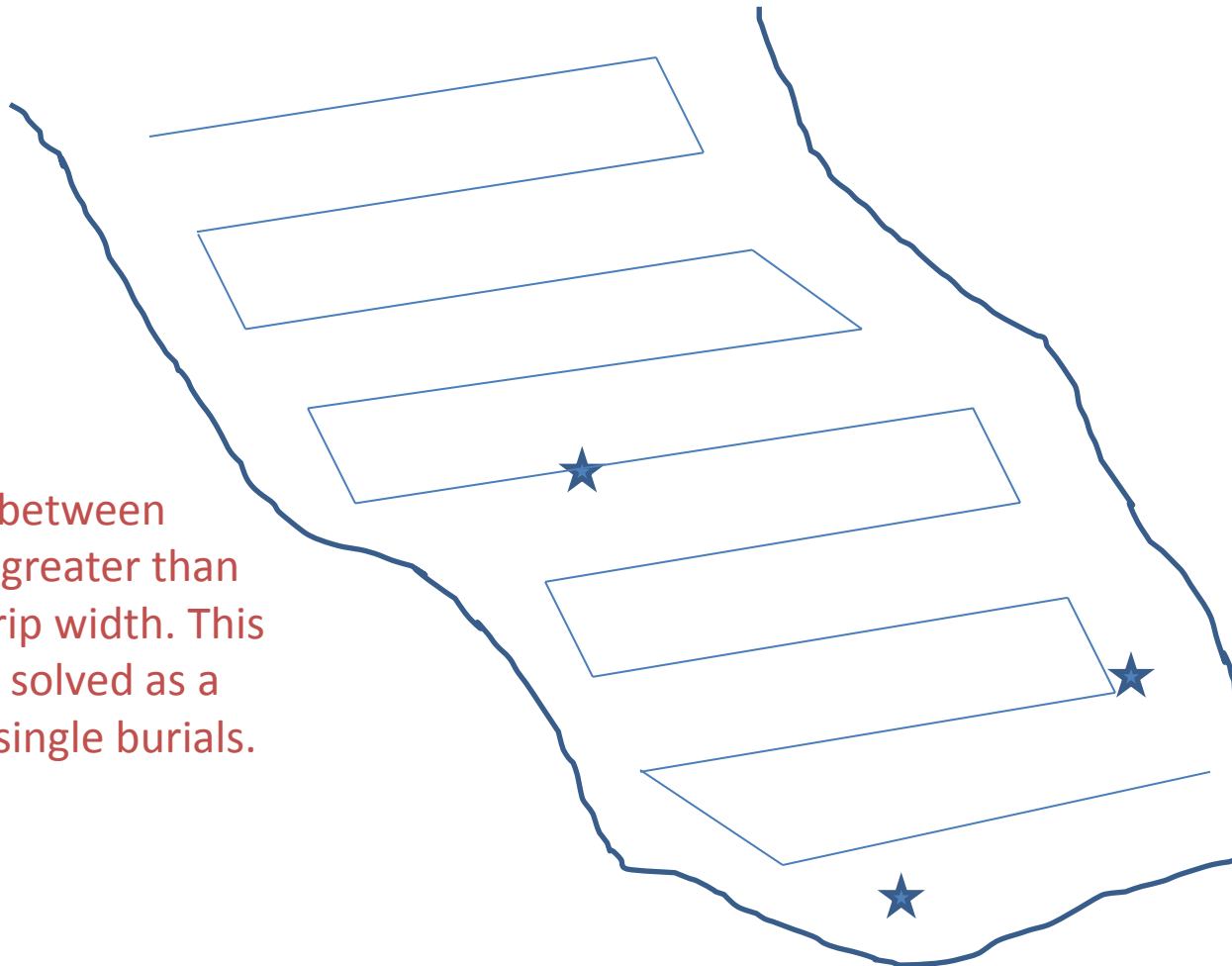
- Multiple burials are hard for anyone
- Some have developed individual techniques
- Need teachable techniques
 - Micro strip search
 - 3 Circle
- Can often treat these as a series of individual burials.

This topic is a trigger point for controversy. My take is this: your first job is to get dialed in with one and two beacon burials. If you use a modern beacon with marking/flagging functions, you will most likely be able to solve 3 beacon burials reasonably quickly, *most of the time*. No matter your beacon model, once you get to 4 or more burials, you will often struggle to locate all in short time. In this situation, the best thing is for multiple beacon searchers to access the debris from different locations, thus finding different signals more easily. If you're a recreational user and not a professional guide or rescuer, you might want to consider not delving further into the specialized techniques. If you are a professional, or are using older 2-antenna beacons without marking functions, you should be practicing these techniques but only after firming up all the other avalanche rescue skills. You'll have your hands full in an event like this!

Multiple Burials

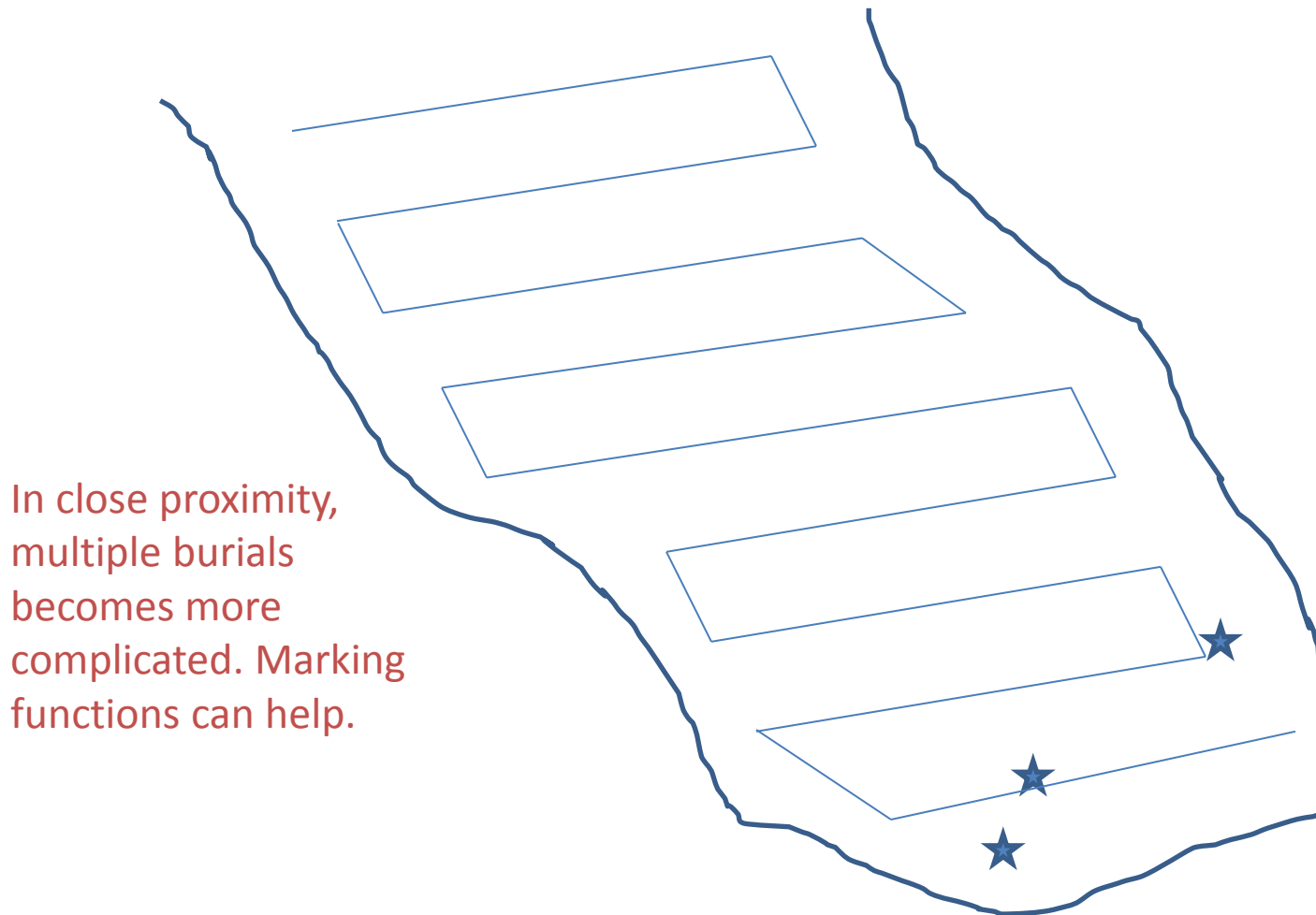
Option #1: Treat as a series of single burials.

Distance between burials is greater than search strip width. This would be solved as a series of single burials.



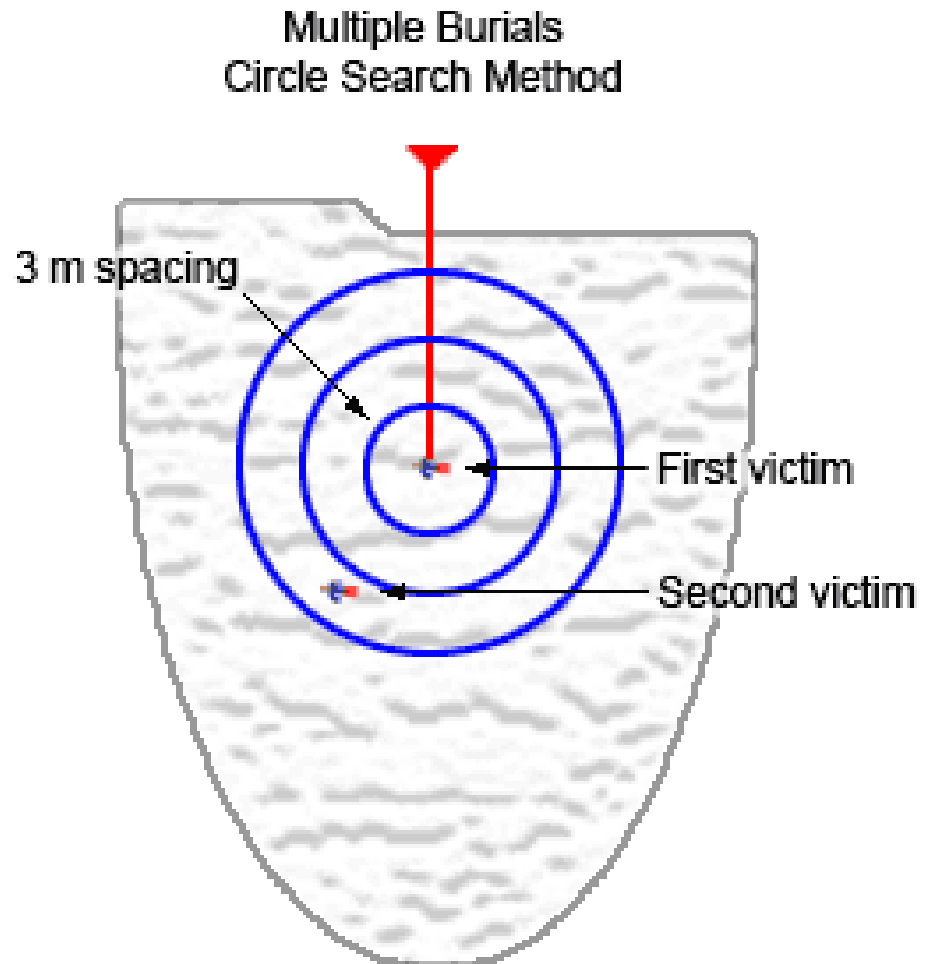
Multiple Burials

Option #1: Treat as a series of single burials.



Multiple Burials—3 Circle Method

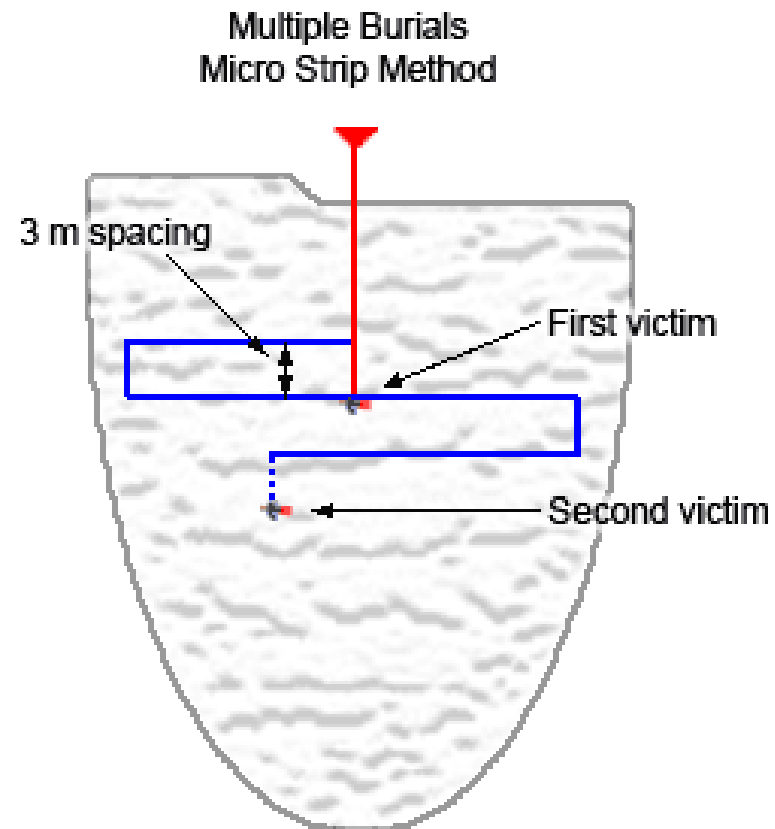
- 3, 6, 9 meter radius away from found victim



Multiple Burials—Micro Strip Search

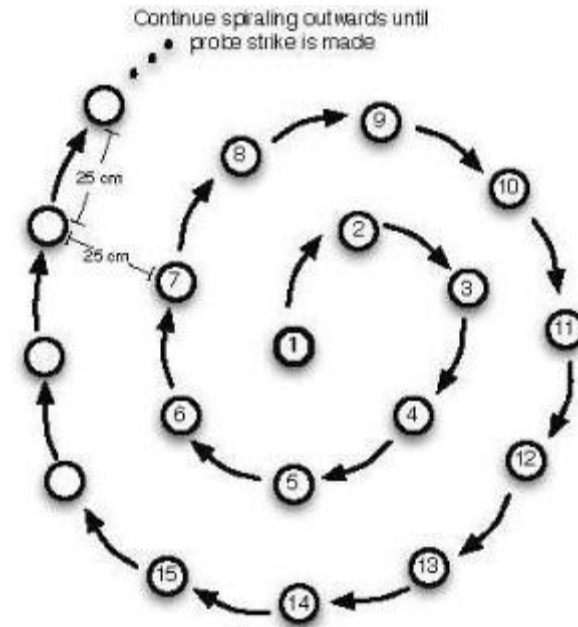
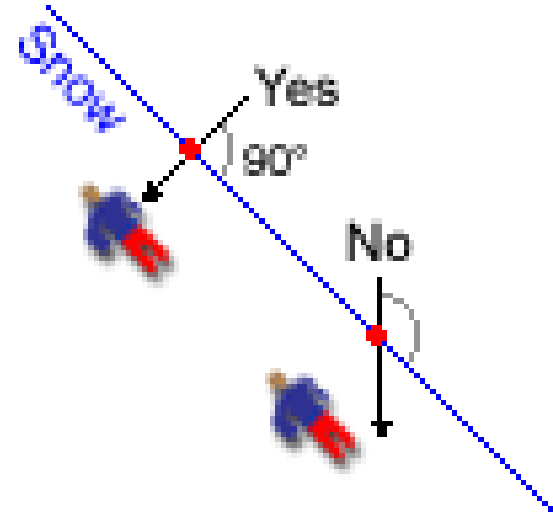
- Like a series of pinpoints—don't rotate or reorient the beacon
- 2-5 meter search strips

Both the 3-Circle method and the Micro-Strip search method have papers published that you can find online. I intentionally did not include the finer points in this presentation, because it is a potential rabbit hole that only should be explored by those who have already mastered the more fundamental aspects of avalanche rescue.



Probing

- Regularly deploy your probe (I've seen numerous probes fail at the wrong time. They are necessary for quickly pinpointing a victim's location.)
- Wear your gloves
- Probe perpendicular to snow surface
- Hands apart to prevent deflection
- Spiral outward 10"
- Use shovel to mark center where fine search ends



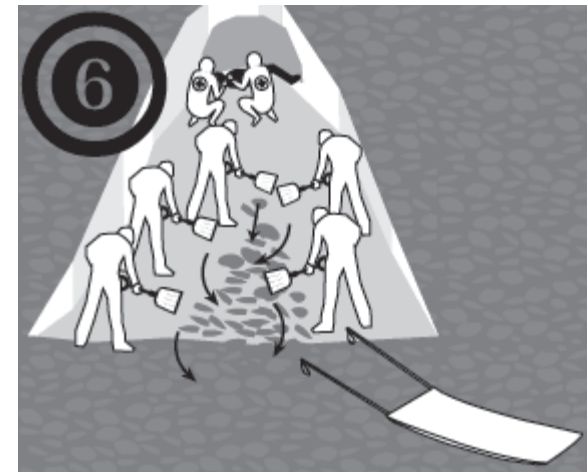
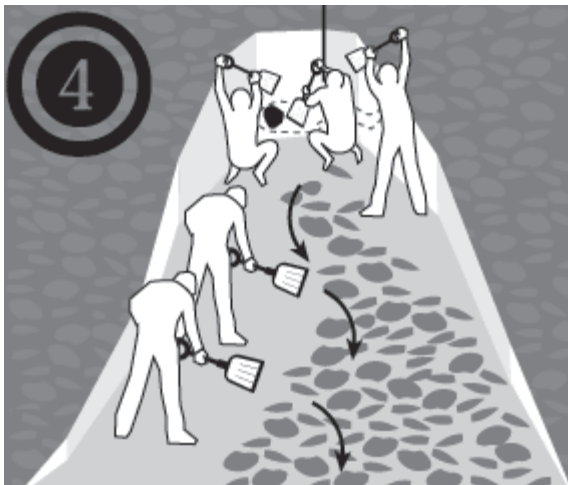
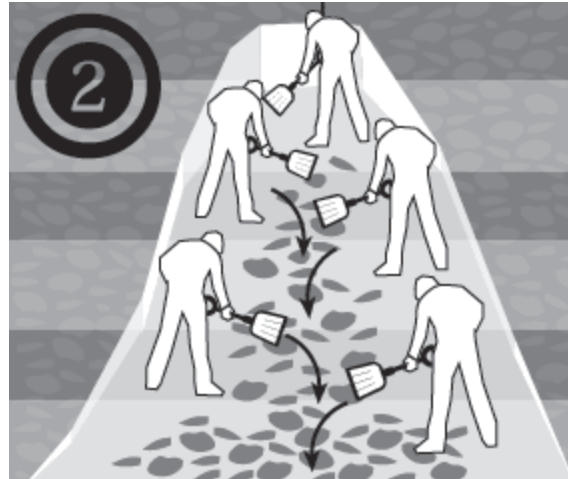
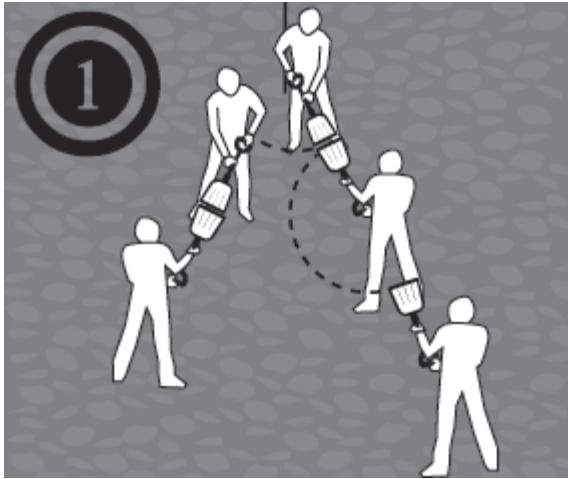
Digging

- Need to quickly access patient's airway
- Need to facilitate removal of snow
- Don't want to collapse potential air pocket
- Time required to excavate to victim

Leads to...

Development of advanced shoveling techniques

V-Conveyor Belt



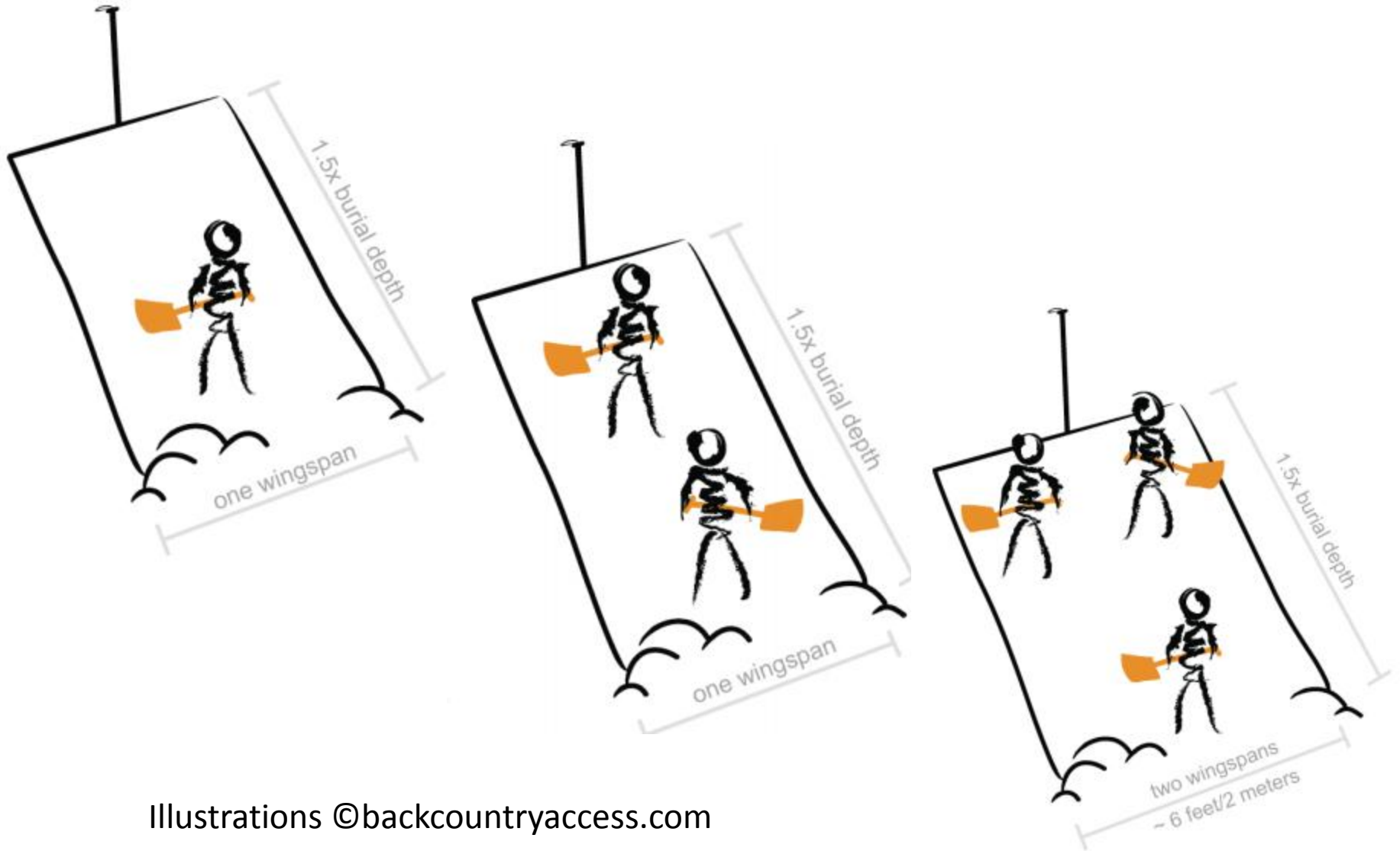
V-Conveyor Belt

- Size of V
 - Flat terrain = 2x burial depth
 - Steep terrain (20-25°) = 1x burial depth
- Rotate positions about every 4 minutes
 - Balances fatigue with efficiency in position
- Works well with ample resources (i.e. 3 or more)

“Strategic Shoveling”

- Developed by Dale Atkins and Bruce Edgerly
- Designed for 1 or 2 rescuers, up to 4
- Move snow to sides first, keeping downslope clear for snow later (shovel only once)
- Performs well in shallow burials where quick access to airway is more important than clearing snow out of the way

“Strategic Shoveling”



Illustrations ©backcountryaccess.com

Development of Hypothermia Protocols for Avalanche Patients

- ABC's are still priority #1
- Time since burial is critical to care choice
- Remember, trauma is a regular occurrence and needs to be treated
- Look for obstructed airway when you get to face—helps inform decision how to provide care

A lot has been written the last few years about how to care for hypothermic avalanche victims. Here is one link, if it interests you (and maybe it should?), go find more:
<http://www.ikar-cisa.org/ikar-cisa/documents/2012/ikar20120117000875.pdf>

Evacuation Plans

Evac options are very dependent on location. Planning ahead and preparing accordingly is the best thing you can do to help ensure the best outcome possible.

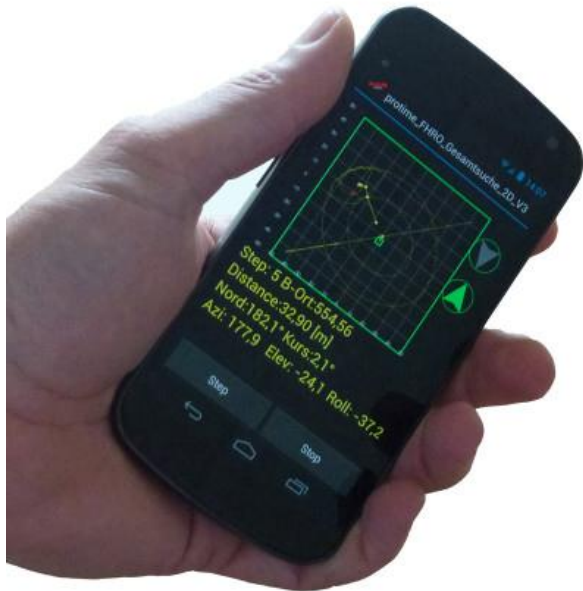
If you need organized rescue help, it is often hours away. Have the gear you need to spend several hours with an injured patient.

What would that include?

Grab Bag

- Rotation of beacon during searches
- [Signal overlap](#)
- Auto Revert & Rescue Send
- Use of smartphone apps as rescue tools
- Lifespan of beacons/inspections

This was a short list of topics that we could cover if time had allowed and attendees were interested. If they interest you, there are ample resources available online. Also, contact me or other avalanche educators if you have specific questions about these topics.



This is an add-on to make a smartphone act like a transceiver. I have no idea how well it works, but the smartphone-as-transceiver idea is generating interest, though the professional community has been very reluctant to embrace the idea. Personally, I agree with the nay-sayers at this time. I see potential for future applications, but for the foreseeable future, standard 457 transceivers will be the tool of choice for companion rescue.

The End