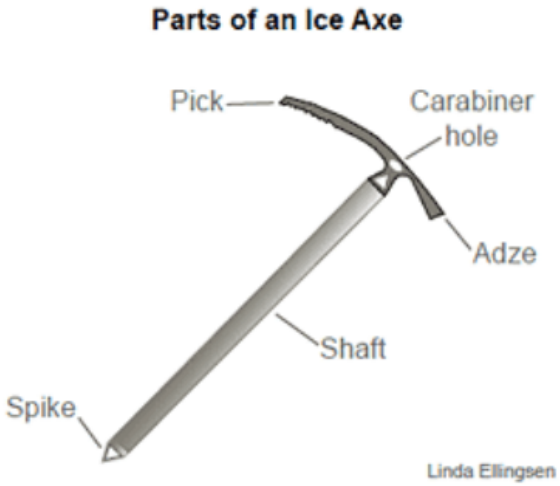
Advanced Snow Skills Training

This training event will not cover ice climbing skills but will focus on some of the skills required for travelling on steep icy snow and in advanced glacial terrain. Below are more details of the techniques we will practice.

<u>ICE AXE SELF ARREST:</u>
This is required by anyone planning to travel on icy snowslopes. An ice axe is a carried in the hand and used prevent or halt a slide down icy snow slopes. Climbers should practice this regularly (at least every 1-2 years).

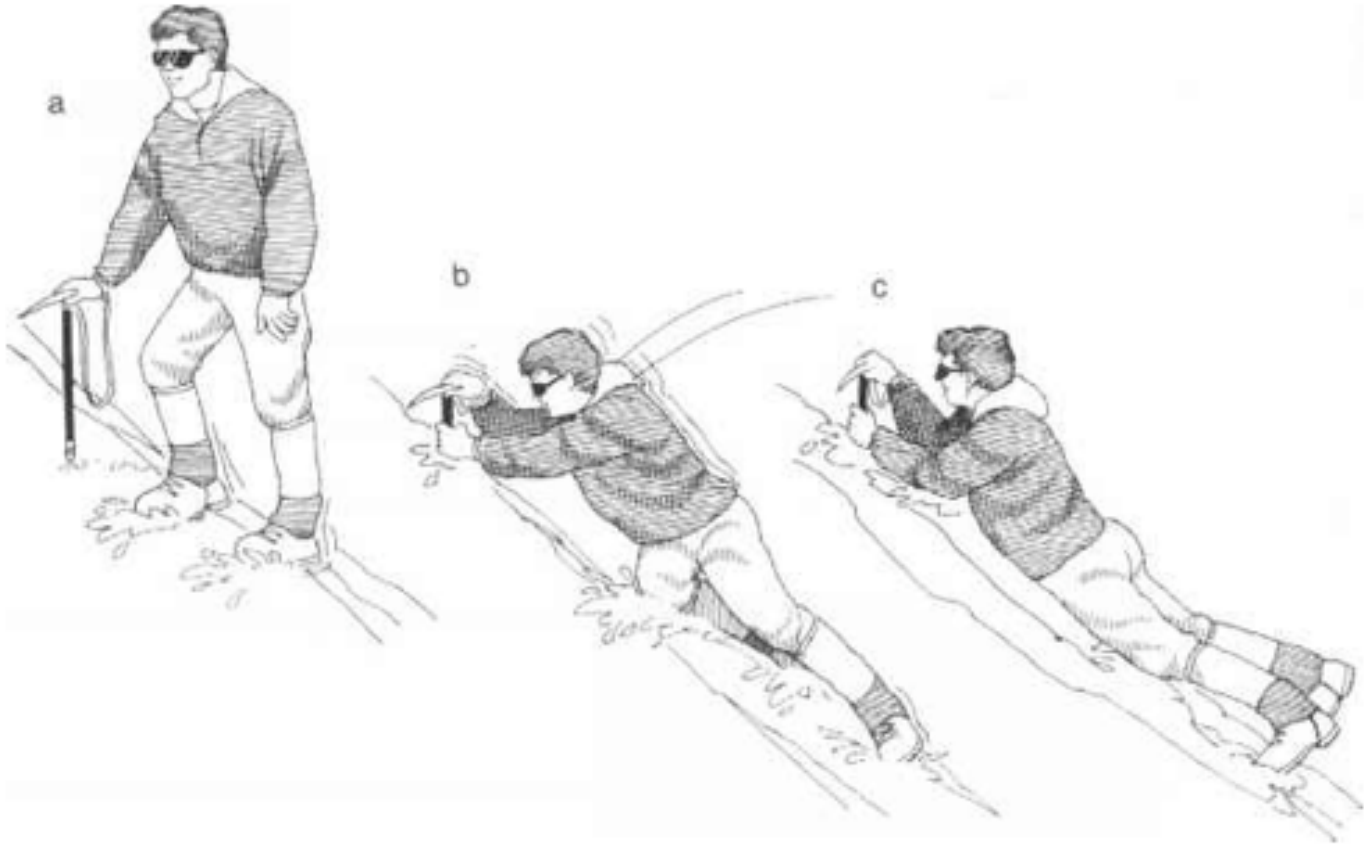
We will do a refresher training in the following (with idea of teaching to others):

1) Ice axe safety (how to not knock out your front teeth on axe while trying to self arrest. (This is a real hazard – two senior CSMC'ers have seen a friend do this.)

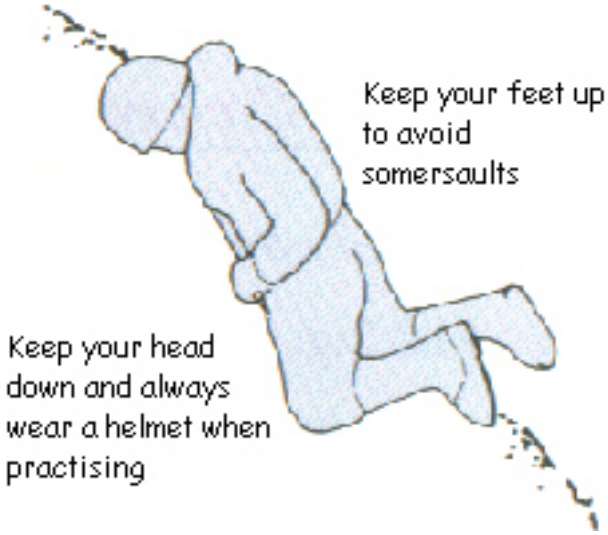


2) How to walk with axe – hand on head, shaft down, point facing backwards, axe in uphill hand

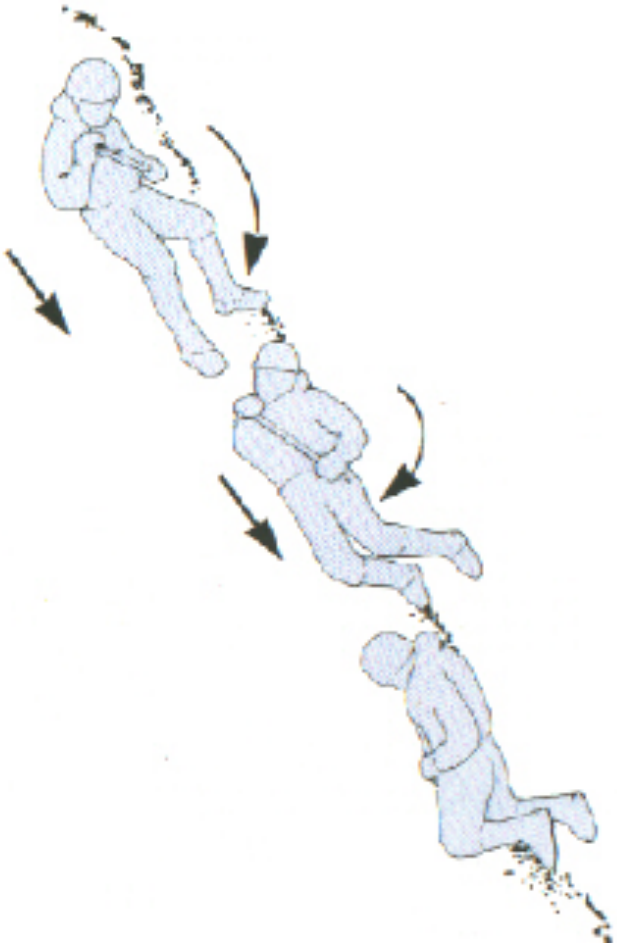
3) Self belay – grab axe as low on shaft as possible to prevent a slide starting. Practice this with axe in either hand.

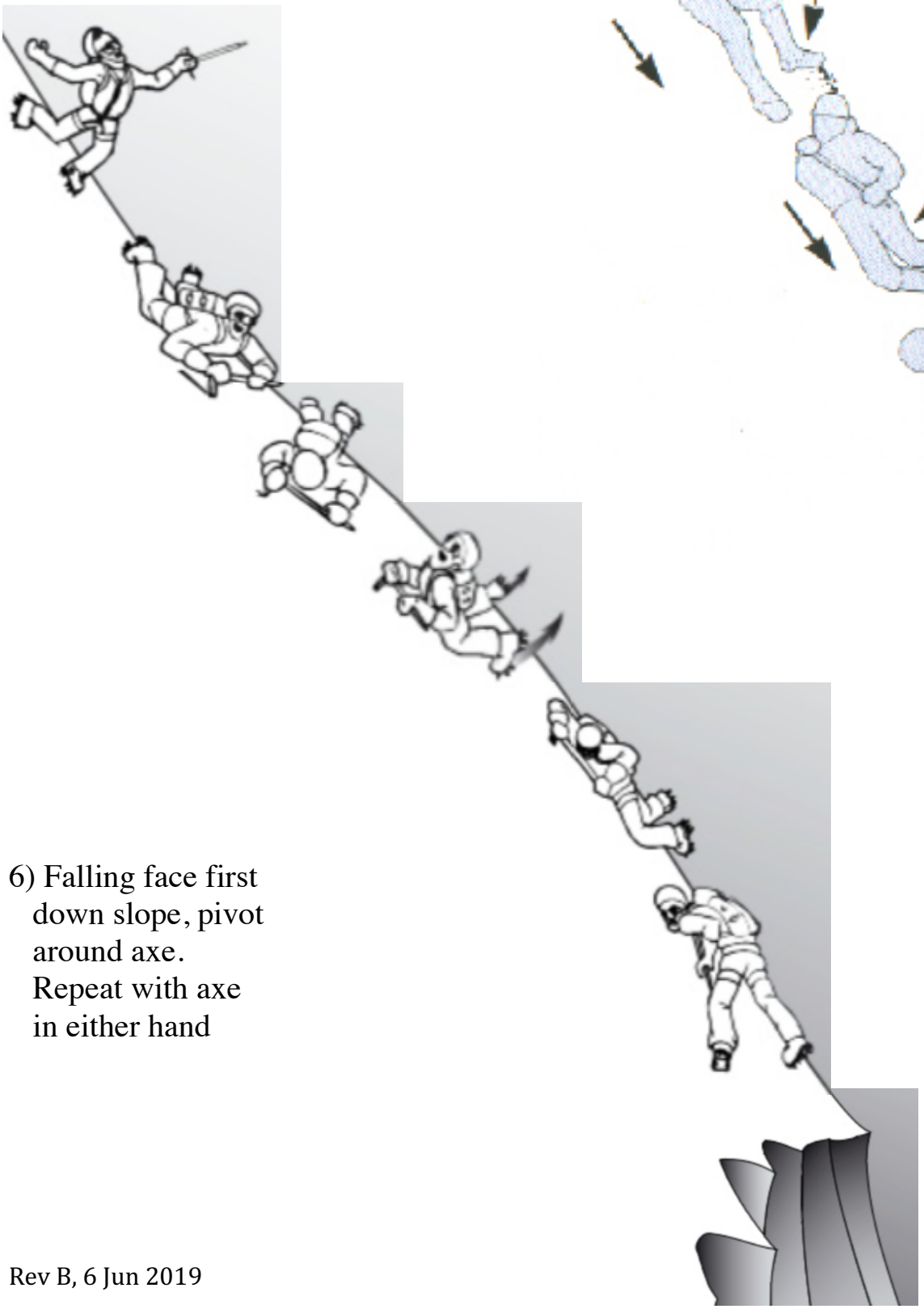


4) Self arrest on front, facing into slope. Practice this with axe in either hand.



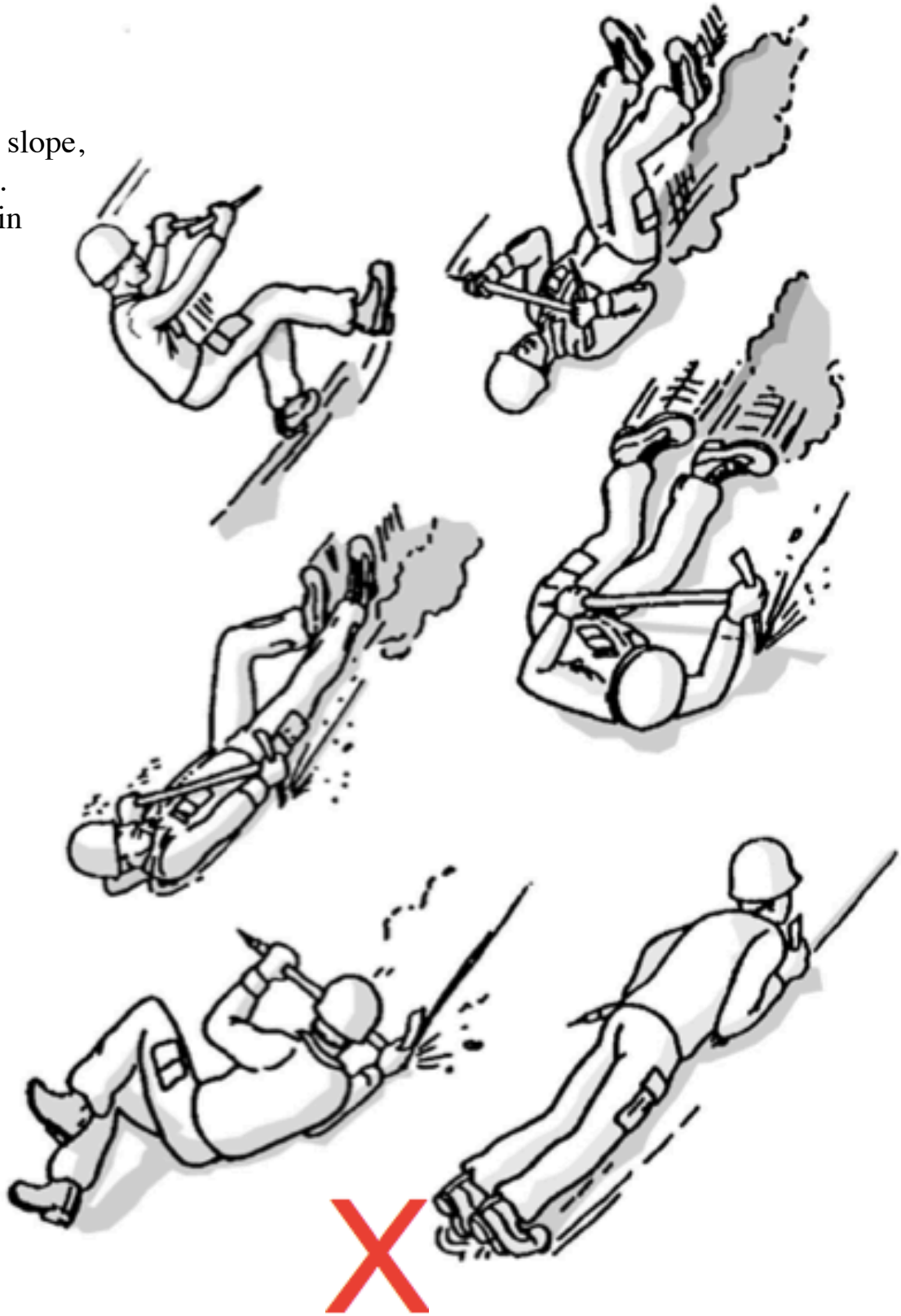
5) Self arrest on butt, roll over into arrest. Practice this with axe in either hand





6) Falling face first down slope, pivot around axe. Repeat with axe in either hand

7) Falling headfirst backwards down slope, pivot around axe. Repeat with axe in either hand

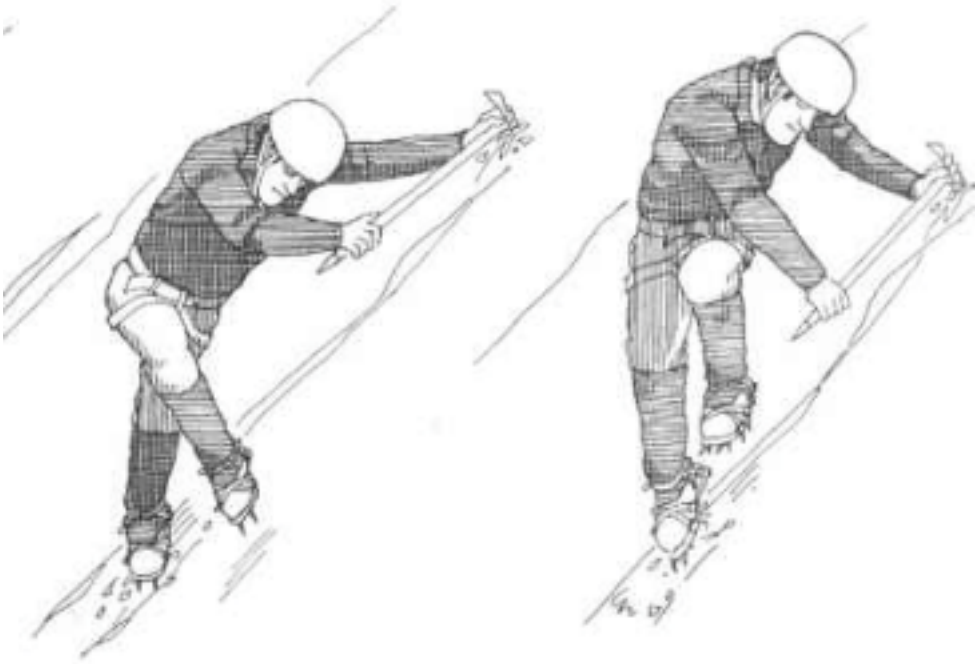


8) For all ice axe self arrest positions, lift the feet anytime you are sliding (if your feet are lower downhill than your waist). If it's serious terrain you will be using crampons, and if you don't raise your feet with crampons on you will tumble, perhaps break an ankle, and most likely lose your axe.

CRAMPONS AND STEP KICKING:
We will discuss the use of crampons (spiky things attached to your boots for traction) on icy snow (not ice) conditions, including how to teach these skills to others.

1) How to walk to avoid catching crampon on pants leg.

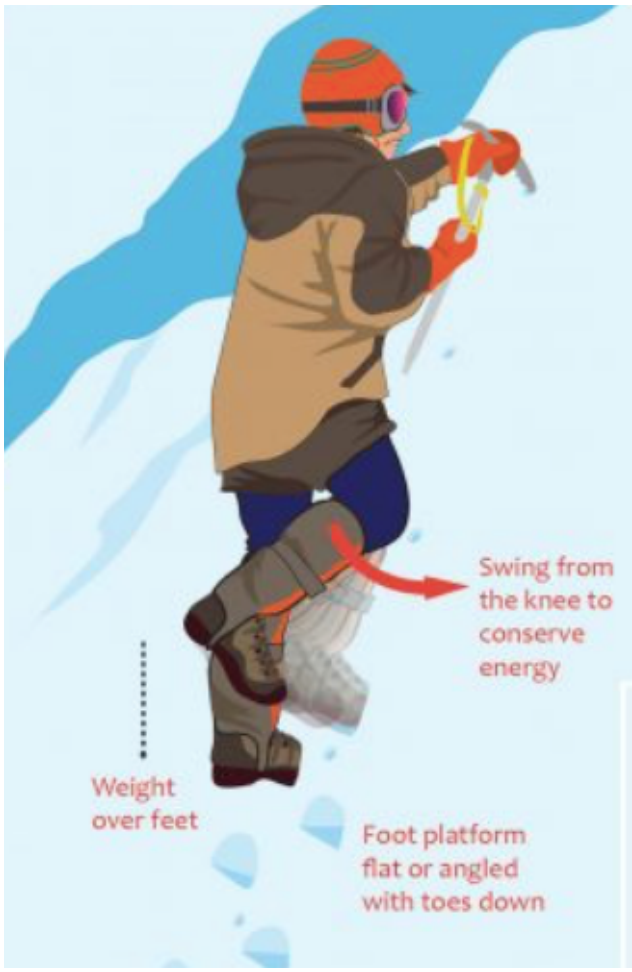
2) French pointing – rolling the ankle to keep all points in contact with the snow



3) Front pointing combined with axe up to hilt

4) Front pointing with dagger technique

5) Kicking steps in soft snow on ascent.



6) Plunge steps in soft snow on descent

GLISSADING (BUM SLIDING):

Keep good control of axe. Hands on axe in self arrest position, ready to roll over and self arrest if necessary.

Legs bent, use feet for control.

No crampons.

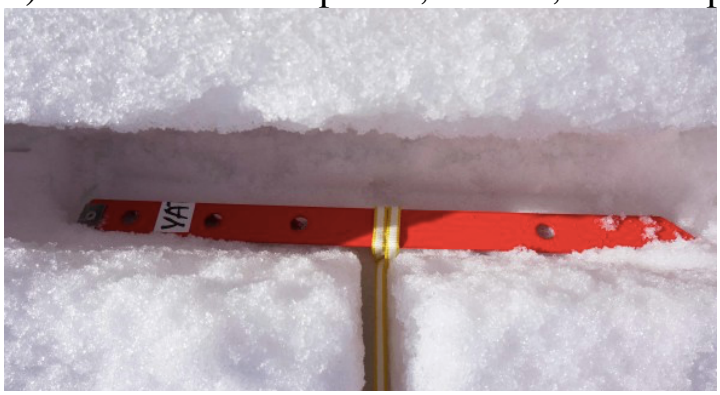
Always keep control if snow is icy and/or steep. Start very slow, speed up once you're sure it's safe.

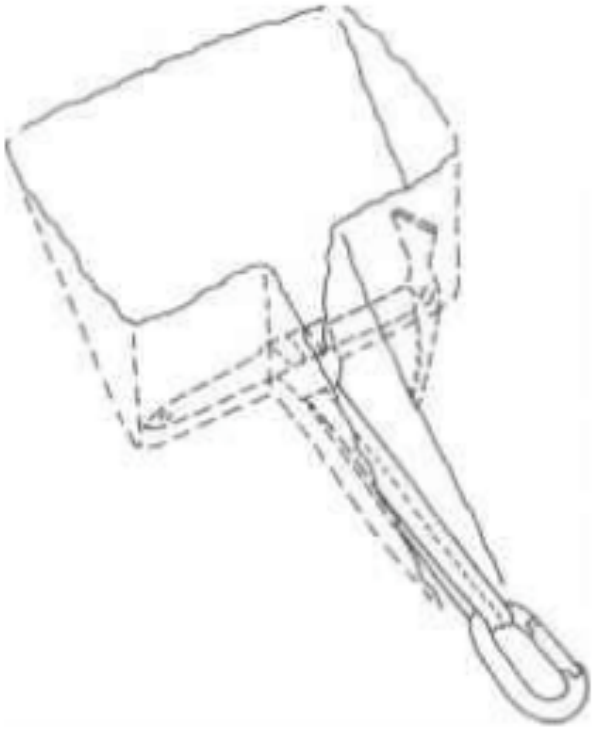
Slide on one cheek to go faster!

SNOW ANCHORS:

We will go over the following snow anchors (as time and snow conditions allow):

1) Buried tee snow picket, ice axe, or snow pig

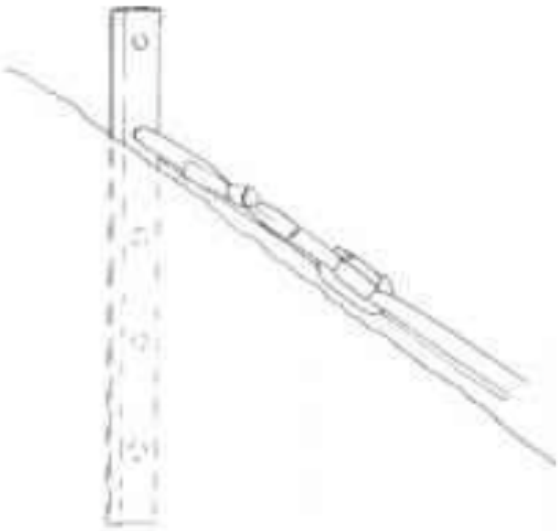




Sitting belay. With snow anchors never load so as to pull upwards. Always position yourself so as to put as little load on the anchor as possible.

2) Make-shift anchors eg using buried skis, poles, backpack, etc.

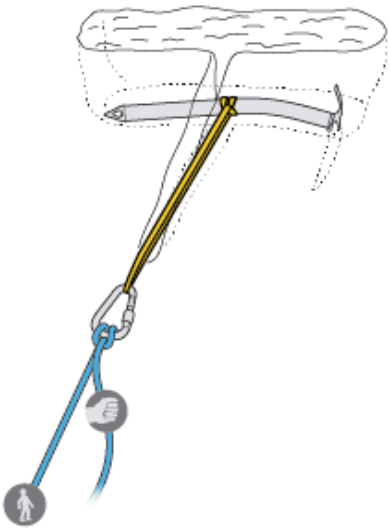
3) Quick running anchor options such as boot axe belay and vertical picket.



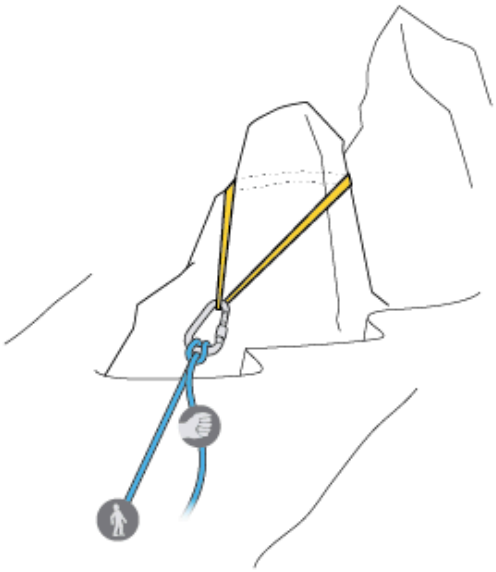
Note this is not a guide-taught course. Our volunteers may not know the latest best taught techniques for runners and snow anchors in Canadian conditions – please come prepared to share ideas and your own training.

Other examples of anchors that may be used on a snow slope or glacier:

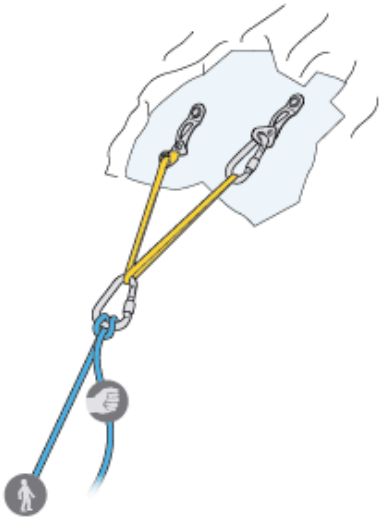
Ice axe used as a deadman



Sling around a rock horn



Two triangulated ice screws



5) Always consider forces and risks of travelling roped over steep slopes and above crevasses.

In this photo the upper climber is on hard glacier ice with exposure over crevasses below. In terrain like this, travel carefully. It may be safer to not rope up; or alternatively use runners for safety if travelling as a roped team. This is because it is very difficult to arrest a fall when roped as a team - it's not possible to coordinate the self arrest in a serious slide. (This has been proven by guides.)

GLACIER TRAVEL:

In this section we will discuss some aspects of roped glacier travel, including how to teach this to others, as follows:

- How to rope up for glacier travel if there's anyone who doesn't know this (however it's expected that for advanced training everyone knows this).
- Safe travel techniques to avoid a serious /deep crevasse fall, or pulling the whole team into a crevasse.
- We will not go over roped retrieval systems for extracting a fallen climber (this is taught by CSMC on separate events).

1) Roping up for glacier travel – basic systems to teach newbies:

- Usually rope up with 3 per rope as a minimum.

- Tie in with butterfly knot.
- Typically about 12 to 15m between climbers (more distance between climbers if only 2 climbers, less distance if 4+ climbers).

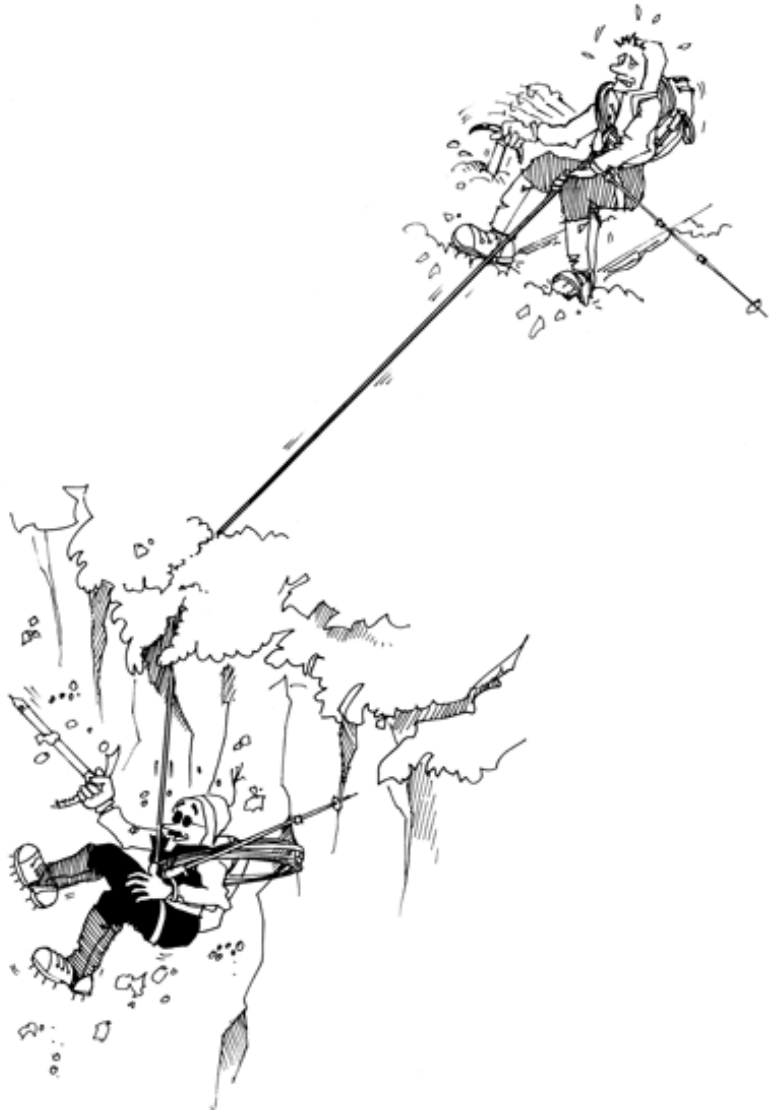
- Take the number of people on a glacier travel rope team, and subtract that from 10. That gives you the number of arm spans between climbers. For 3 climbers that's 10-3 = 7 arm spans.
- Coil up spare rope at each end, carry in/on pack.
- Put 2 prussic cords on the rope

2) On approach to crevasse keep at 90 deg to crevasse (as much as possible) to avoid zippering and serious/deep crevasse fall and injury.

- Don't always follow in your leaders footsteps. The 2nd will sometimes need to swing wider than the leader to stay at 90 deg to the crevasse.
- The 2nd must pay attention and travel so as to keep their leader safe. Eg if leader is traversing along a crevasse looking for a narrow spot to jump, the 2nd should travel in parallel staying at 90 deg to the crevasse (as much as safe to do so).
- The 3rd should keep safety of both in mind, bearing in mind there may be other crevasses. (Where there's 1 crevasse there's usually several.)

3) The difference in seriousness between uphill versus downhill. It's much harder to hold a fall downhill especially on icy snow or glacial ice, and if leading partner is heavier than you.

On downhill terrain stay focused – keep the rope tight and pay attention.



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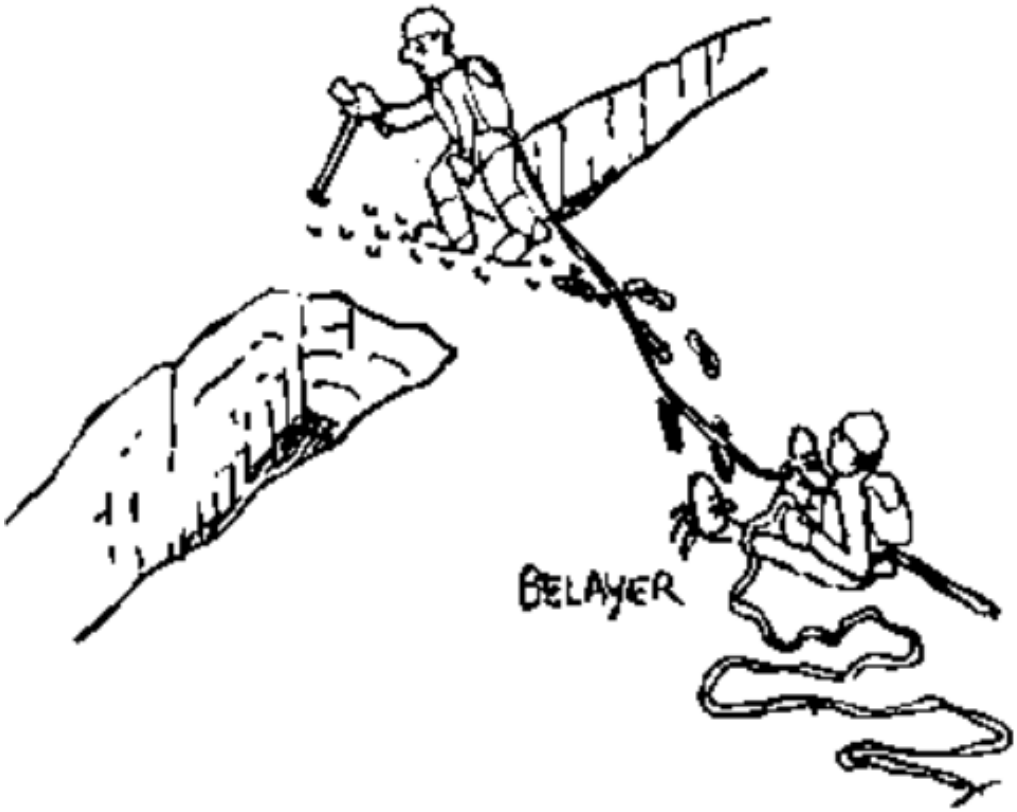
Consider placing an ice screw to protect if crossing a snow or ice bridge or descending steeply on icy open glacial terrain.

Place axe deeply or sit down for a quick belay if partner is crossing a crevasse in soft snow conditions, especially if they are downhill of you.



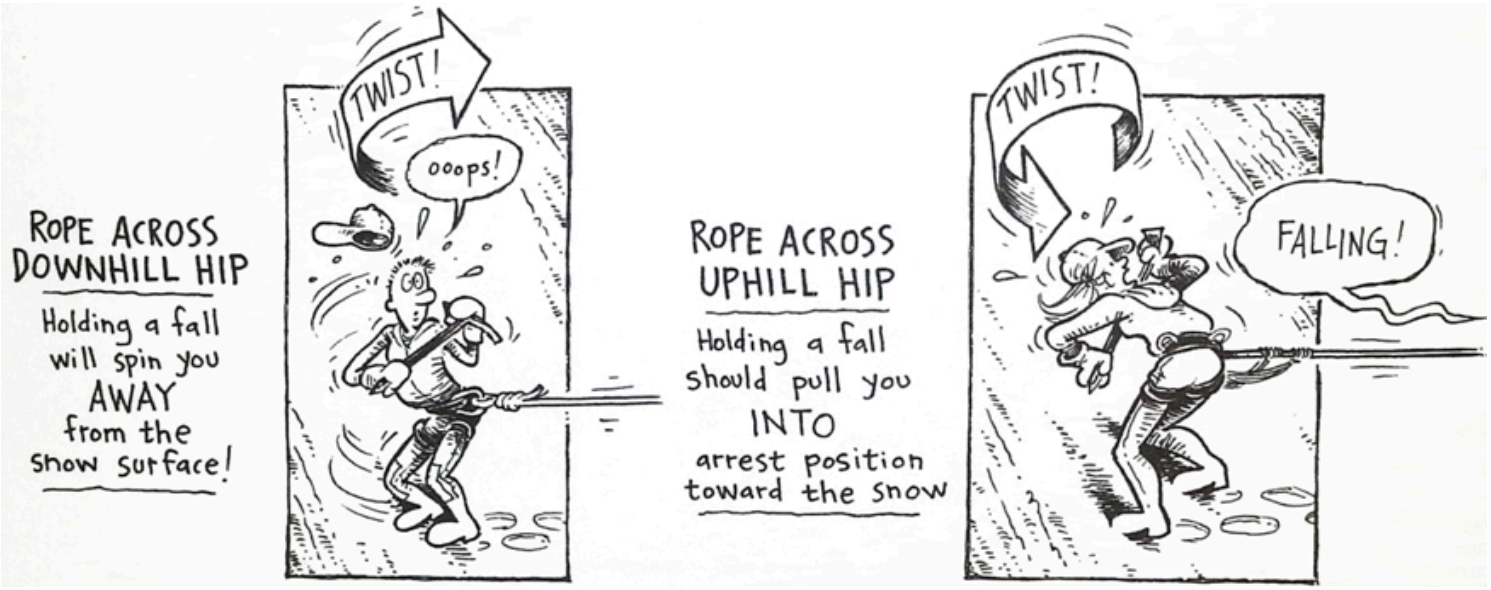
4) When stopping for a break either:

1) stop as a roped team keeping the rope fairly taught between climbers,
2) or probe for crevasses before coming together as a team

5) How to take the rope up tight if your partner sticks a foot into a crevasse. If they say "tight" or sink up to their waist, back up fast, swing out wide (if safe to do so) to get 90 degrees to the crevasse, and brace for impact! Don't yard on the rope hard as you might pull them in (they may be suspended out over a snow bridge). Let your partner give you directions as to what they want.

6) If crevasses are big use longer rope between you.

7) Consider which side to place the rope depending on whether you or your climbing partner are more likely to fall. Think about the forces.



SAFETY:
If teaching others ice axe skills, start with a safety talk first. Remind your team that the ice axe is a weapon. Teach folks (and yourself) to instinctively cling to the axe whatever happens. (Think like rock climbing belay, where you learn to hold the rope even if rocks falling on you or you are yanked upward holding a big lead fall.)

Teach yourself and others the correct self arrest position to hold the axe so as not to knock out front teeth if axe suddenly catches on ice or rock.

When self arresting with crampons on, a broken or sprained ankle is a common injury. Folks must lift the feet instinctively as part of the self arrest action (since in serious terrain you will be wearing crampons.)

When training in Canadian conditions it can help the training to pull on each other's feet and/or a rope to compensate for soft snow and make the self arrest more challenging. Get the team to communicate if they have any injuries or if it hurts, and consider angles and reaction forces.

Also if testing snow anchors, you might want a backup rope to avoid taking out the pulling team if the anchor fails suddenly.

Please consider safety first, whether practicing with us or in your own time.

DISCLAIMER:
This event is run by volunteers (who have done their own training and plenty of practical experience). We are not professionals and are not being paid to run this session.