

## 7. Basic Skills

For the sake of completeness it is important to discuss the fundamental skill set required of a climber and urban abseiler and to consider the importance of getting the basics right and what that means. In the climbing environment one mistake could be a death sentence for either the climber themselves or their companions. Most of the time climbers get away with it and the climbing world is awash with such stories (see any insert). However, these are not just amusing accounts but learning points. Climbers share the stories because it makes an interesting tale down the pub and if the outcome is not tragic then it is a laugh for everyone. The more experience one accrues the greater the likelihood of having some experiences that will influence your future practices – indeed a safe climber relies upon having been close to disaster and working through it. Sharing the stories is as equally useful and although there is sometime reluctance to do so due to pride perhaps or stoicism or even worse, indifference it is these stories that help keep everyone safe.

Insert 11

“Good judgment comes from experience, and experience comes from bad judgment”.

Rita Mae Brown, Alma Mater (2001)

“Learn from Experience”

Motto of Association of Mountaineering Instructors

The one common thread through many of the stories is forgetting the basics; not fastening your harness (especially when Velcro was in vogue), getting a rope stuck, an un-equalised rig resulting in the belayer dangling off the edge and everyone’s favourite – letting go of the dead rope (more common with certain belay devices than others).

### Knots

There are many knots and many books out there with them listed and comprehensive instructions on how to tie them.

Climbers tend to use just four:

- Figure of 8
- Bowline
- Clove Hitch
- Overhand

Knot	Relative strength to rope at 100%
Figure of eight	80%
Bowline	60%
Clove hitch	55%
Overhand	50%

First it is important to differentiate between knots, hitches and lashings.

Climbers don’t use lashings but they are essentially the use of a rope to join two items together.

A hitch is a rope wrapped around another item – if that item were to be removed the knot would ‘fall apart’. The other ‘item’ however could be the rope.

And a knot is a standalone configuration of the rope not involving another item but possibly incorporating more than one rope.

A clove hitch is two half-hitches and an overhand is a half-hitch around itself. An Alpine Butterfly (another knot some climbers use) is two interlocking half-hitches around a central loop. The point being made here is that simplicity is the watchword and it is through repetition that safety is

Photo 62 A double figure of 8 knot



maintained and it is not unusual for young climbers to carry around a length of rope with them at all times for practice. However it is not to encourage doing by rote as in order for a climber to become wise through experience they must survive and diligence at all times is essential. This is not to say that mistakes aren’t made and it is normal practice for climbers to check each other.

The strength of a knot is an important factor as to why certain knots are used and is dependent on the size of the ‘knot radius’ which is not necessarily the same as the size of the knot and the relative compression forces within the knot. **Table 5** gives a precise breakdown and it is clear to see why the figure of eight is a climber’s favourite.

Photo 63 A bowline



Photo 64 Yosemite variation of the bowline



Double Figure of Eight knot.

This is the knot most commonly used for attaching to rope to the harness (photo 62). Known as a re-threaded figure of eight it is tied by starting with a single figure of eight and passing the end through the harness then back around itself as shown in many other books. It can also be tied by folding the rope which produces the loop which can then be clipped to with a carabiner.

Photo 65 Clove hitch



There needs to be enough of a tail on the knot for it to be considered safe and it is common practice to tie a knot in this tail; either a double fisherman’s or an overhand.

## Bowline

This is a sailor’s knot which though not as strong as a double figure of eight and prone to coming undone is commonly used to tie into (Photo 63). It has a major advantage over most other knots in that it is very easy to untie even after a heavy load has been applied. In order for a bowline to be considered safe a double fisherman’s knot must be tied in the end which should sit snugly against the knot. There are a number of variations to this final part of the knot and all are considered safe (Photo 64 – bowline variation).

Photo 67 Overhand knot



Clove Hitch (Photo 65)

As previously mentioned this is a hitch (in fact, two half hitches) and is normally used for attaching to carabiners and can be useful for securing a rig onto a scaffold (Photo 66). It is very easy to tie (and tie incorrectly) and very effective and does not need additional knots to make it safe as long as there is an adequate rope tail.

Photo 66 A rig clove hitched to the top bar



Photo 68 Three way pull on a climbing rig using an overhand, an Alpine Butterfly can also be used



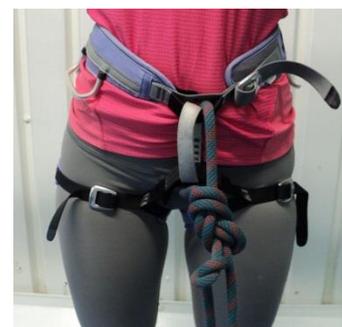
is patently safe.

Overhand (Photo 67)

This is the knot that we can all tie and in a

single strand of rope is only effective for making that rope shorter (and weaker) but with a double rope (i.e. double overhand) is a very effective loop which is strong and can take a three way pull (Photo 68). It is also becoming an increasingly popular way to tie off a figure of 8 knot when attaching to a harness (Photo 69). It is easy, rarely comes undone and

Photo 69 Tying off with an overhand knot



### Prussik knots

These are technically hitches (they fall apart when removed from the rope) and are used to grip the rope in lieu of a hand. Significantly they are, when tied well very strong and if using a full strength material (i.e. a sling) then it is feasible for the rope to snap before the prussic.

The charity abseiler needs to be familiar with different kinds of prussic but the most common one is known as the French prussic.

It is predominantly used when abseiling as a self-arrest mechanism (Photo 70) and the different techniques are discussed in Chapter 12.

Photo 70. Pete using a French prussic to protect an abseil



### Rigging

The principles of rigging do not change, however the techniques do. There are also different rigging systems practiced in different countries but with the advent of the internet and global communications there is becoming more parity as people adopt the best bits of others.

The most important principle is the equalisation of load. Whatever force is being transmitted through the rope it should be distributed to the anchors equally and in such a way that were any anchor to fail there would not be a sudden transferral of the force to the remaining anchors (Fig 16).

The position of the anchors is also crucial to ensure an even distribution of forces between them; too far apart and the force applied through each anchor becomes unjustifiably high as the vector (angle) increases. At 90° or less there is a sharing of the load between each of the anchors but as the vector increases so does the load transmitted to them so that by the time the vector 120° there is as much load on *both* anchors as is being held by the rope.

Photo 71 A small rigging plate



A good rig is one where the forces are transmitted cleanly to the anchors and the more anchors that are required the more difficult this is to do. In climbing it is often easier to equalise the loads by using a long 'cordlette' but if the number of anchors can be kept to a minimum by using 'bomb proof' ones throughout then it results in a simpler and safer system. It is possible to use a rigging plate (Photo 71) and these are more common within rope access and rescue teams.

## Belaying

Belaying is the technique of exerting friction onto a rope thus attaining control. A body belay does this by wrapping it around the body and a direct belay refers to wrapping it around a rock or a tree (Photo 73). Until the invention of belay devices these techniques sufficed and in certain environments are still common – mountaineering for example and in historical recreations. In urban abseiling a direct belay might be a necessity and a quick couple of wraps around a scaffold pole might be all that is required to control the lowering of a rope or a piece of equipment. When belaying the length of rope going from the belay device to the climber/abseiler (or piece of equipment) is known as the ‘live rope’ and the other end which is held by the belayer for control is known as the ‘dead’ end.

There are a few golden rules:

- The rope must be exactly the correct tension. What is the correct tension is more of a moveable feast depending on the type of activity; top roping, leading or abseiling for example. It is also dependant on the person on the sharp end; are they a paying client or a friend who enjoys a ‘sporting’ belay (or not)? And also it depends on the current situation; is the person under duress and needs a tight rope?
- The dead end must never be let go of. Harder than it looks as the hands must pull the rope through and then be swapped back to the starting position. When letting the rope out it is easier.
- The locking hand must remain in the locking position. Some devices have the same position for pulling the rope through as the locking position – some do not. This is also made more difficult by the position of the device relative to the climber/abseiler and the belayer.
- A belayer must be able to belay ambidextrously. A lot easier than it seems at first.

Photo 73 A direct belay to a tree (left) and to equalised anchors on bolts. Kelly, the belayer on the right is using an ‘Alpine plate’ style device



When belaying a climber on a top rope such as might be found at a climbing wall then the rope is coming back into the device and should the climber fall it is pulled in the opposite direction. When a

climber is leading they are taking the rope with them and the rope is pulled from the belayer slowly and when they fall the rope is pulled quicker.

When abseiling the rope is always moving away from the belayer and often quite quickly if the abseiler is very experienced or, more often than not out of control. Being familiar with the subtle movements of the rope and feeling what is happening to the abseiler takes practice and experience and there are a few tricks worth passing on:

- Always watch the abseiler – always.
- Keep one hand on the belay device to maintain better control (except for ab-racks and self-arrestors). When not using one hand on the device use *both* hands on the rope in case of kinks or knots.
- Let the rope run over the side of your shoe to feel for tension (old leather shoes best for this).
- Keep your rope dry.
- Knot the *top end* of the safety rope to the abseil structure with a knot which can be undone easily if required. This allows you to take the rope out of the belay device after every abseil safely and the kinks will fall out of the rope.

Insert 12

I once had the rope 'buck' out of my hand due to a kink when belaying a heavy adult and they quickly began to free fall as I tried vainly to grasp the flailing dead end. A combination of my long hair and thick skin saved the day as my hair became trapped in the belay device for long enough to allow me to grab the *live* rope as it was not moving quite so erratically. I melted the skin on my hand and had to cut my hair free much to my embarrassment and to the delight of the group. The abseiler brushed the ground on the bounce but were otherwise unharmed.

Belayer error is a very common factor in accidents and no-one should consider themselves immune. It is the sign of experience to listen to others and to accept feedback from other people however indignant it might make anyone feel at the time. Everyone makes mistakes and the responsibility of being someone's belayer is not to be taken lightly.

### **Training**

These basic skills are only 'basic' to an experienced climber and are not easily acquired. The technique of belaying can be taught to a child in a few minutes by an experienced instructor but they should never be considered safe until they have years of experience. Even a novice adult cannot be considered safe and indeed, most people who climb have preferences when it comes to the person they let belay them. As for successfully belaying a long drop abseil it is extremely difficult to not only acquire these skills but to know what these skills are; people are rarely in a position to allow an inexperienced person take control of the rope at their own and as such getting the experience *and* guidance required is problematical. The success of the event and the perception of the company running the event are interlinked and everyone completing the abseil needs to have as good an experience as possible. Although there are a lot of companies out there doing the job safely there is

still a broad spectrum of 'good' when it comes to belaying well. Many issues that have to be dealt with by the experienced rescuer on the job are caused by bad belaying.

It is important to be clear where responsibilities lie and any mistake made by an inexperienced member of the team is likely to fall on the shoulders of the abseil leader. A dropped karabiner, a slack belay rope, a missed leg loop – all are signs of someone working outside of their comfort zone and demonstrate incompetence at this level. Even an experienced climber can be found wanting when leaning out of a window, 100m up balanced precariously on the ledge of an old clock tower – especially when it first goes “BONNNG!!!”

It is during the initial site visit that staffing can be determined and where it is identified that an urban abseil novice can be employed then it is careful that appropriate strategies are put in place prior to them being in a position of danger or responsibility.

- Documentation – this is discussed in the next chapter but all of it should be read and understood by staff members. Useful additions may include contracts, training logs and codes of conduct. Clearly demarcate areas of responsibility and necessary, demonstrative skill sets.
- Equipment – ensure that staff are well equipped prior to the event by suggesting the appropriate equipment you would like them to bring and what is going to be supplied. It is normal for this kind of event for personal safety equipment to be supplied by the staff member but guidance might be required depending on the particulars of the event.
- 'What ifs' – if only as a theoretical exercise these should be considered: What if a novice member of staff drops a piece of equipment? What if a novice member of staff doesn't clip in near the edge? Ask yourself – do you know the answers to these questions? If you do not then there is still a bit of work to be done.

We need then to consider the training requirements of staff in the context of the job and the skills required. If the job is straight forward in all other respects i.e. good access, solid scaffold platform, safe take off. Then it may be a good environment to bring on a new member of staff where they can experience the difficulties of operating a rope over such a long distance. Teaching technique is down to the individual but it is instructive to allow a qualified person to just get on with it. Many have the insight and ability to work effectively in this environment although there are a few that benefit from pointers here and there.

The hard skills detailed throughout the book are easy to teach and monitor but the skill of an urban abseiler is not only being able to perform these skills but to do so whilst at all times appearing calm, unhurried and at all times keeping one eye on the environment around them. Can they spot someone creeping to close to the edge whilst in the throes of calming down a crying client and lifting them over the edge? Are they able to quickly adapt a rig so they can move to another stance and assist the belayer with a difficult client?

These skills come with ability and experience however there are a few do's and don'ts that will help all working in the difficult environment.

- If possible set your cowstail so that your position is leaning slightly back over the edge. This gives reassurance to the abseiler. The right length should allow you to kneel on the edge as well and reach down to the abseiler thus being able to provide a reassuring hand through all the difficult section.

- Use body contact to provide reassurance such as a hand holding the back or front of the harness but avoid 'pulling'. However gentle 'pushing' by holding the front of the harness seems to imitate gravity and allows the weight of the rope to be effectively countered and doesn't cause any stress (if done carefully).
- Eye contact can be important but scared abseilers need a better focus – get them to watch the rope moving through the descender.
- After initial instruction let scared abseilers put their hands wherever they want – people generally hold onto the most reassuring thing possible. If this is your arm so be it – work with what you have.
- If using an Italian Hitch make sure it is correctly loaded prior to the abseiler leaning back otherwise the resulting 'jerk' can cause undue stress.
- As well as the safety rope keep control of the abseil rope as this will allow you to counter any imbalances, potential swings or slips. You can also push it out and/or up to limit the 'over the edge lurch'.

However there are no short cuts to gaining experience and the responsibility to train others is very real whether it is for the benefit of the abseilers themselves or from a marketing point of view or, more importantly contributing to the vast array of knowledge within the profession which, when disseminated produces best practice and high standards.