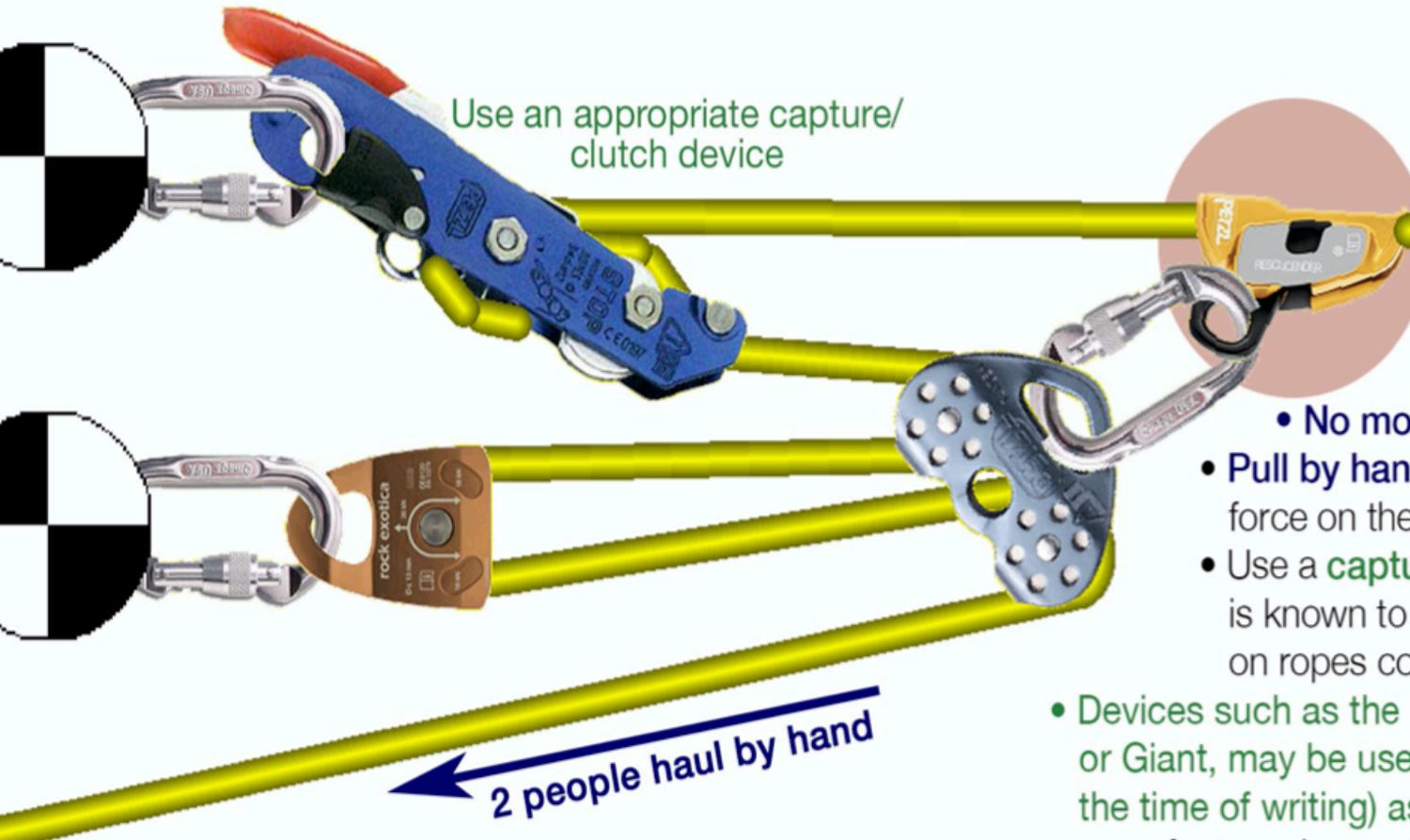


Haul system for rigging a Tyrolean (or hauling a heavy casualty) (Theoretical 5:1 mechanical advantage)



Use an appropriate capture/
clutch device

Warning: Toothed devices can damage ropes if too much force is applied to them (4kN+). Alternative jamming devices such as a SHUNT, Duck, Prusik, or RESCUCENDER are known to slip, so may protect your rope

Important Notes

- No more than 2 people haul at any one time
- Pull by hand only, this should limit the amount of force on the jammer to no more than 4kN
- Use a capture/clutch device (STOP illustrated) which is known to slip under loads, beware slip rates will vary on ropes condition (e.g. wet, dirty) and diameter
- Devices such as the Petzl RIG or ID, S-Tec Flo, CAMP Druid or Giant, may be used (confirmed with the manufactures at the time of writing) as a capture/clutch device. Consult manufactures instructions for more details
- Toothed devices (such as the Traxion) must not be used as a capture/clutch device as they will damage ropes. GriGris should also be avoided as they are prone to jam under high tension.

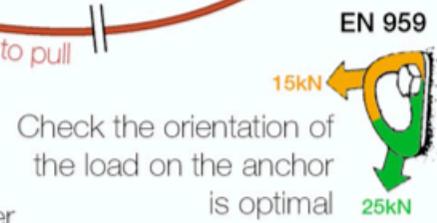
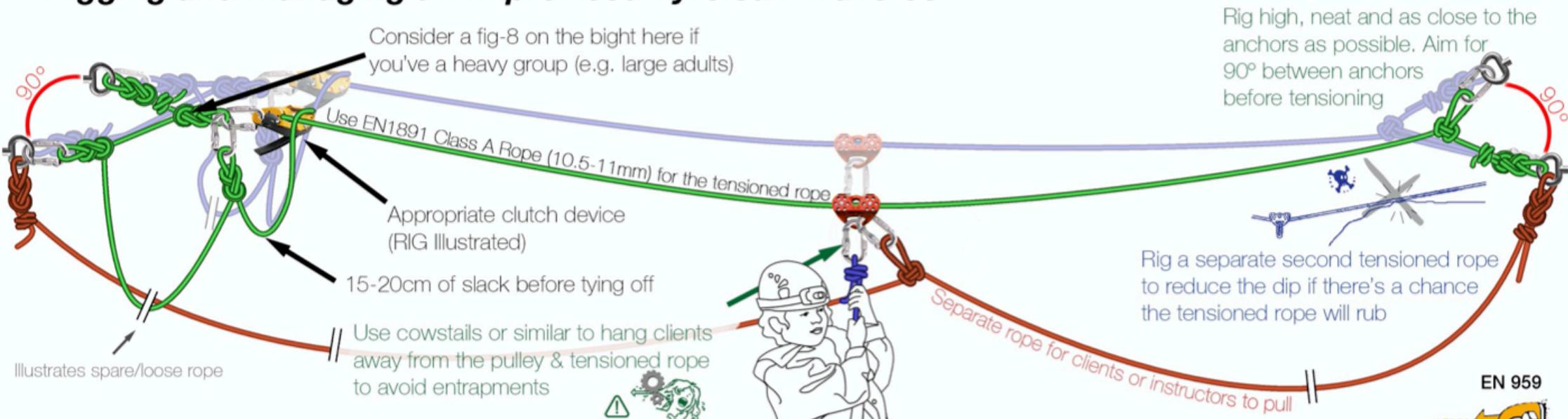


Once tensioned tie the rope directly into the main anchor with 15-20cm of slack. Should the tensioned rope be overloaded the rope should slip slightly through the STOP limiting potentially damaging forces

Manufactures observed slip rates on low-stretch ropes

	S-Tec Flow	Petzl RIG	Petzl RIG (pre 2018)	Petzl ID	Petzl STOP	Camp Druid	Camp Giant
10mm		4.7kN		4.4kN	4kN	4kN	4kN
10.5mm	3.9-4.4kN		5.4kN				
11mm	4.2-3.8kN	>7kN	6.9kN	6.5kN	5kN	5kN	5kN

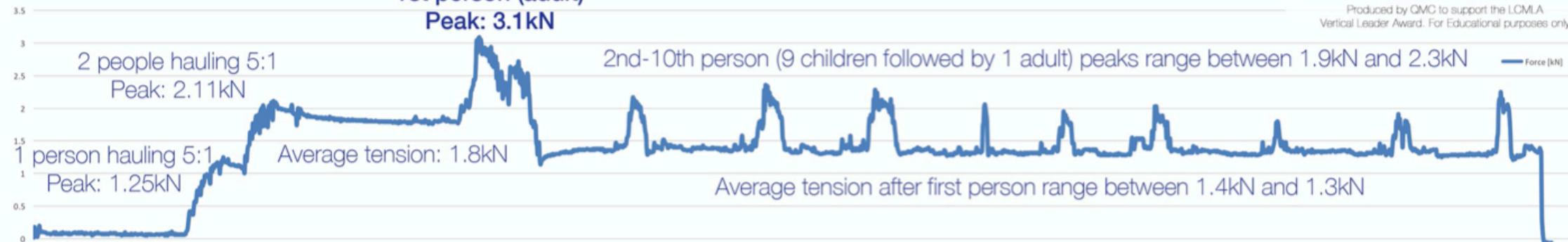
Rigging and Managing an Improvised Tyrolean Traverse



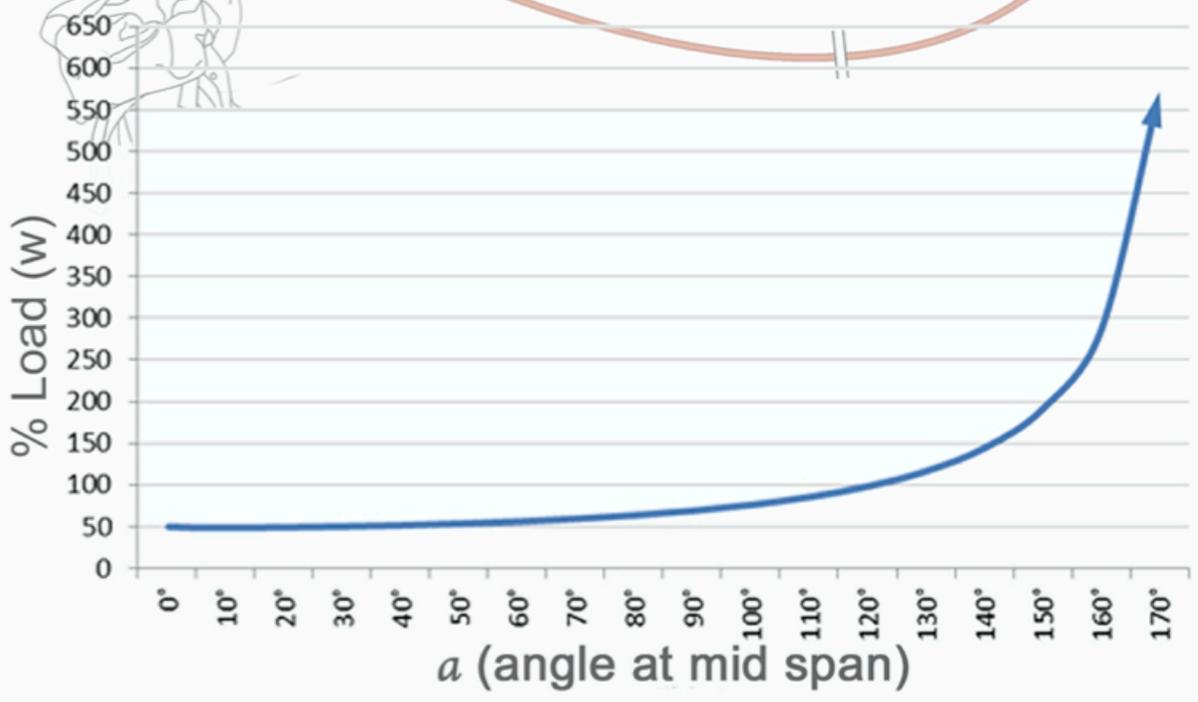
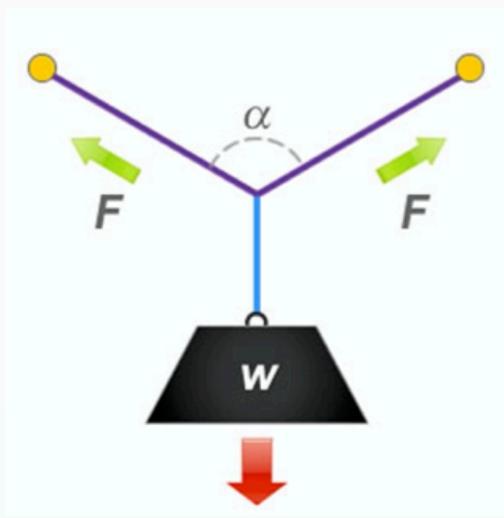
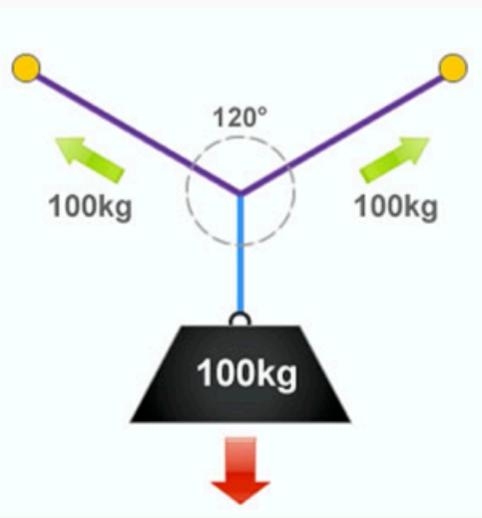
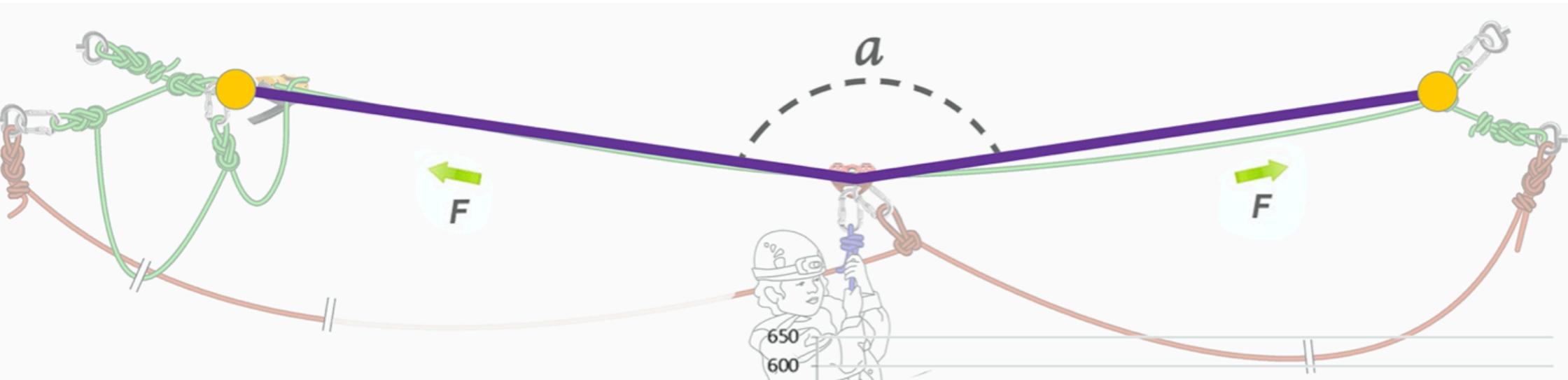
8. Thoughts on rigging and managing a Tyrolean Traverse

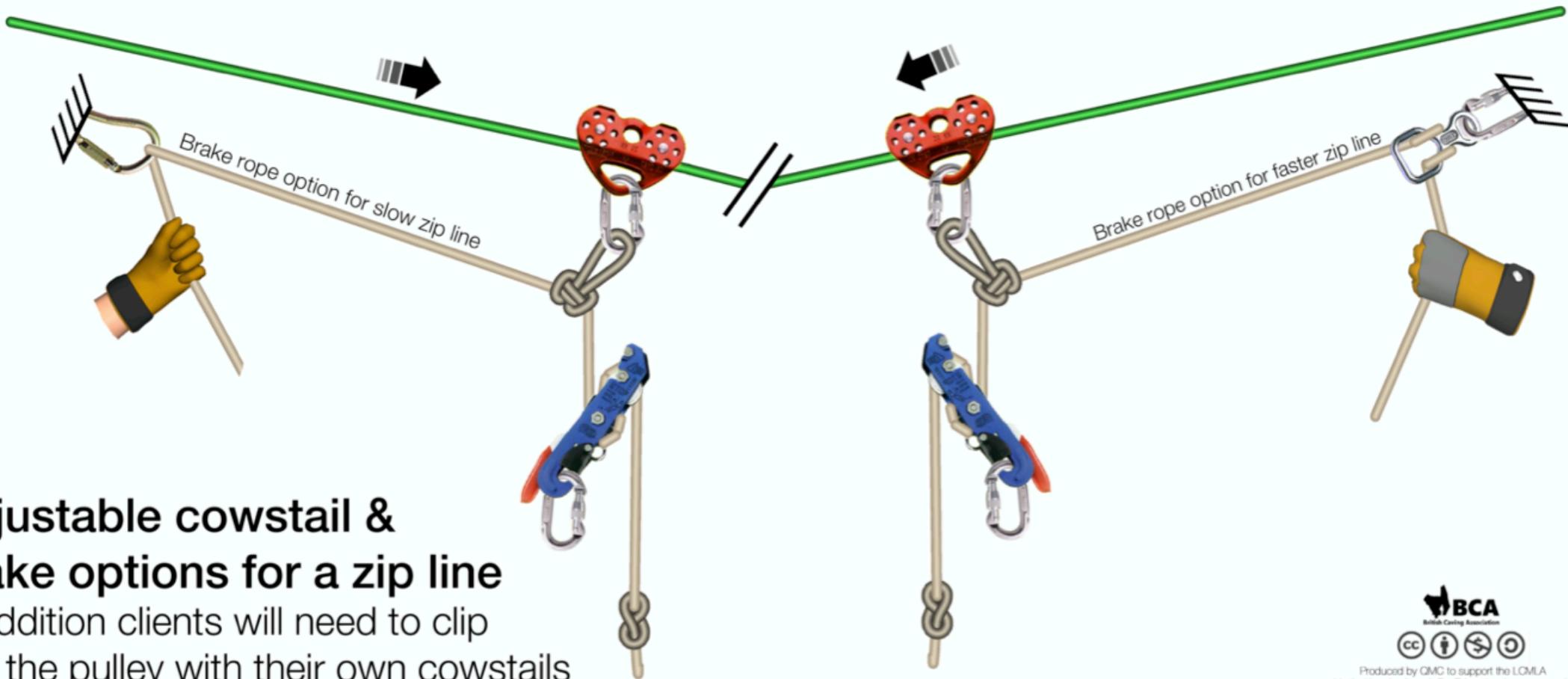
- Keep all rigging compact to provide maximum space at the launch and landing sides for you and your clients
- Rig your tensioned line high; attach clients by cowstails (or similar) to reduce the chance of hair/finger entrapments in the travelling pulley, this also reduces the possibility of shock loading the tensioned rope when launching, and may make landing easier
- Tension the Tyrolean with no more than 2 people hauling via 5:1 system (see Rigging Guide Page 8.1)
- Leave 15-20cm of slack rope between the capture/clutch device (e.g. a Druid, FLOW, RIG, ID or STOP) and tie back to the main belay. This allows the tensioned rope to slip if over-loaded
- Use an additional rope for clients to pull themselves across with (or for the instructor to haul clients across) and recover the double pulley
- **Avoid any rub points**, or ropes rubbing/twisting. Take particular care with edges when the tensioned rope is loaded. Install additional tensioned rope if necessary
- If installing a second rope use separate (ideally mirrored) rigging and ensure you're using good anchors (e.g. resin anchors) as the loads on the anchors will increase
- Send the largest person in your party across first (if possible), the tension in the rope will decrease a little (**see chart below with an example of loads**) after the first person. Re-tension if necessary but only once (no more than 2 people hauling a 5:1 system). Repeated re-tensioning may overload the system
- After use if knots are too tight to untie by hand you've probably overloaded the system. Next time consider an additional tensioned rope
- See supporting document for further information (www.train4underground.co.uk/tyrolean)

1st person (adult)
Peak: 3.1kN



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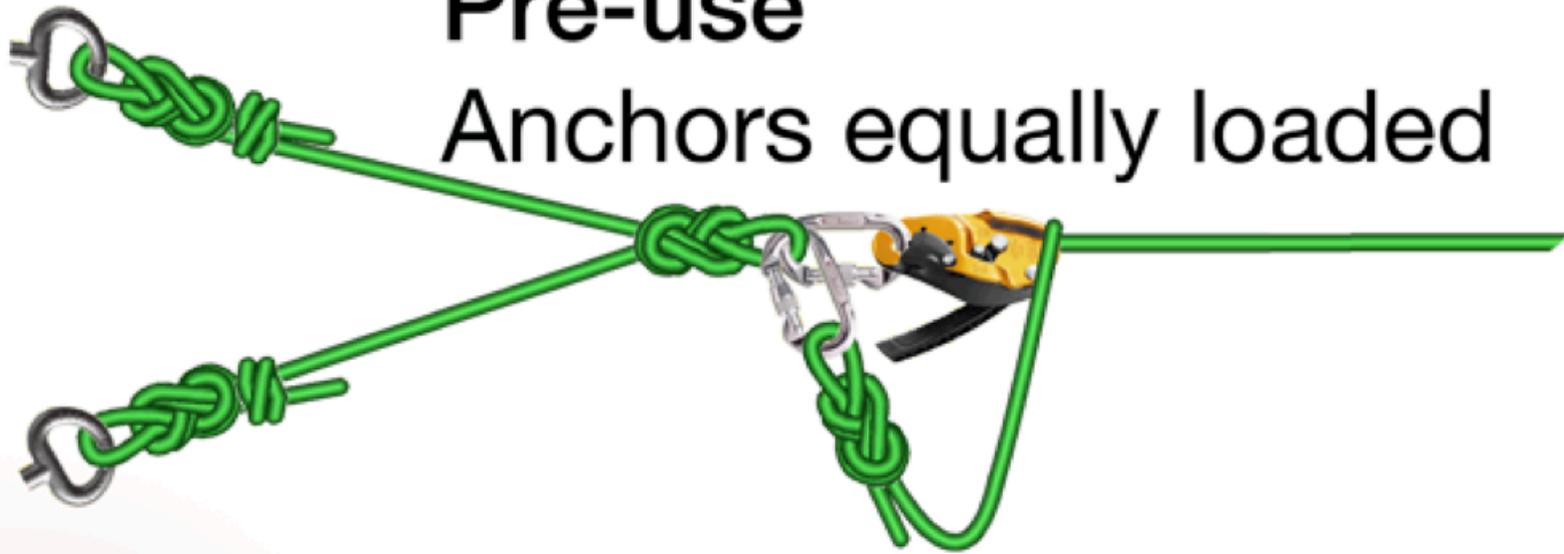


Adjustable cowstail & brake options for a zip line

In addition clients will need to clip into the pulley with their own cowstails

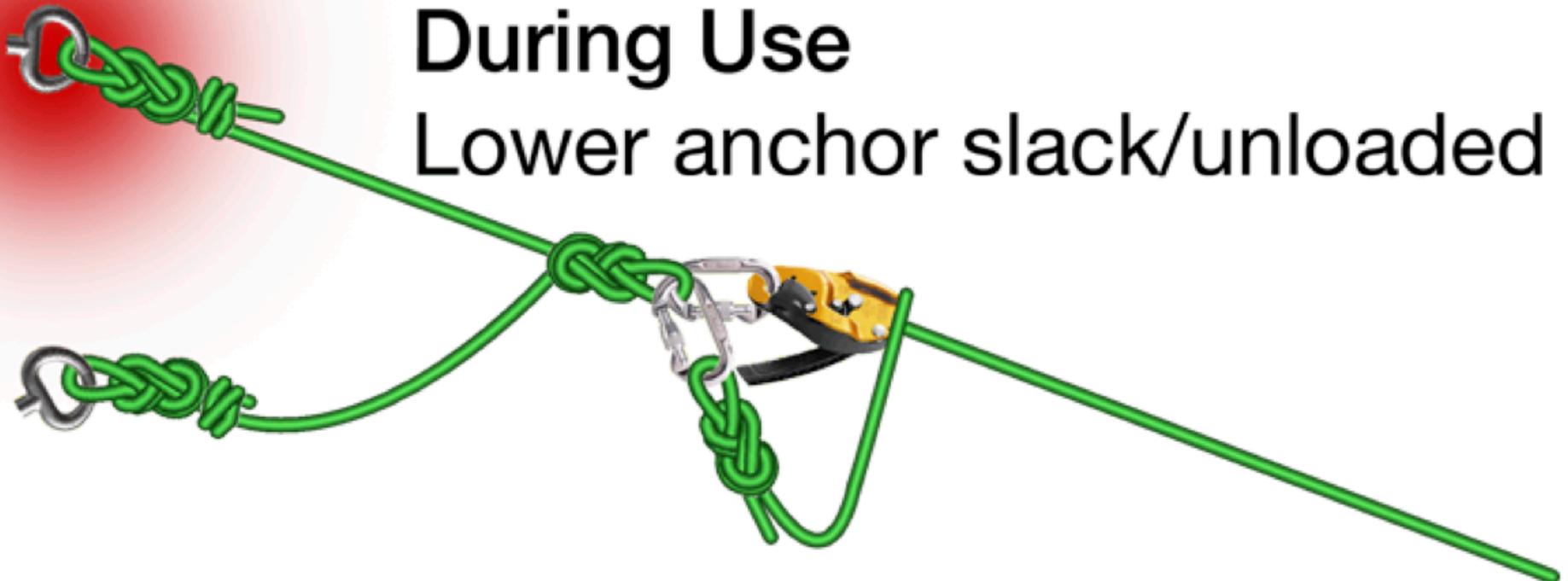
Pre-use

Anchors equally loaded



During Use

Lower anchor slack/unloaded



Redirection near pitch head

Note the smaller the redirection of the tensioned rope the lower the force on the anchor(s)

