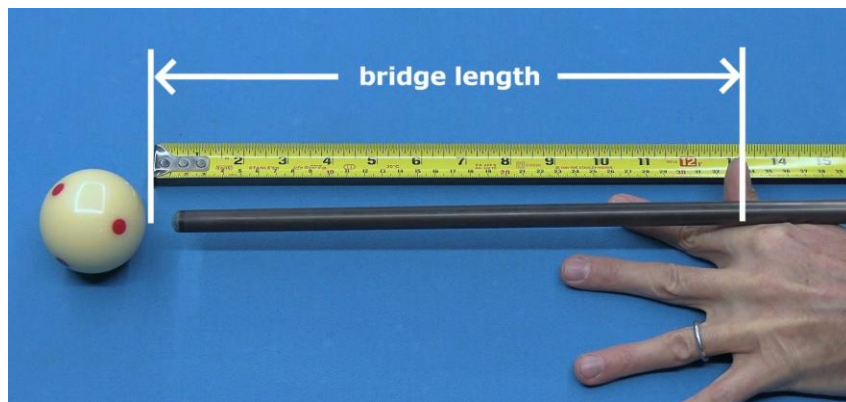


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*Supporting narrated video (NV) demonstrations, high-speed video (HSV) clips, technical proofs (TP), and all past articles are available online at [drdavepoolinfo.com](http://drdavepoolinfo.com). Reference numbers used in the articles help you locate the resources on the website.*

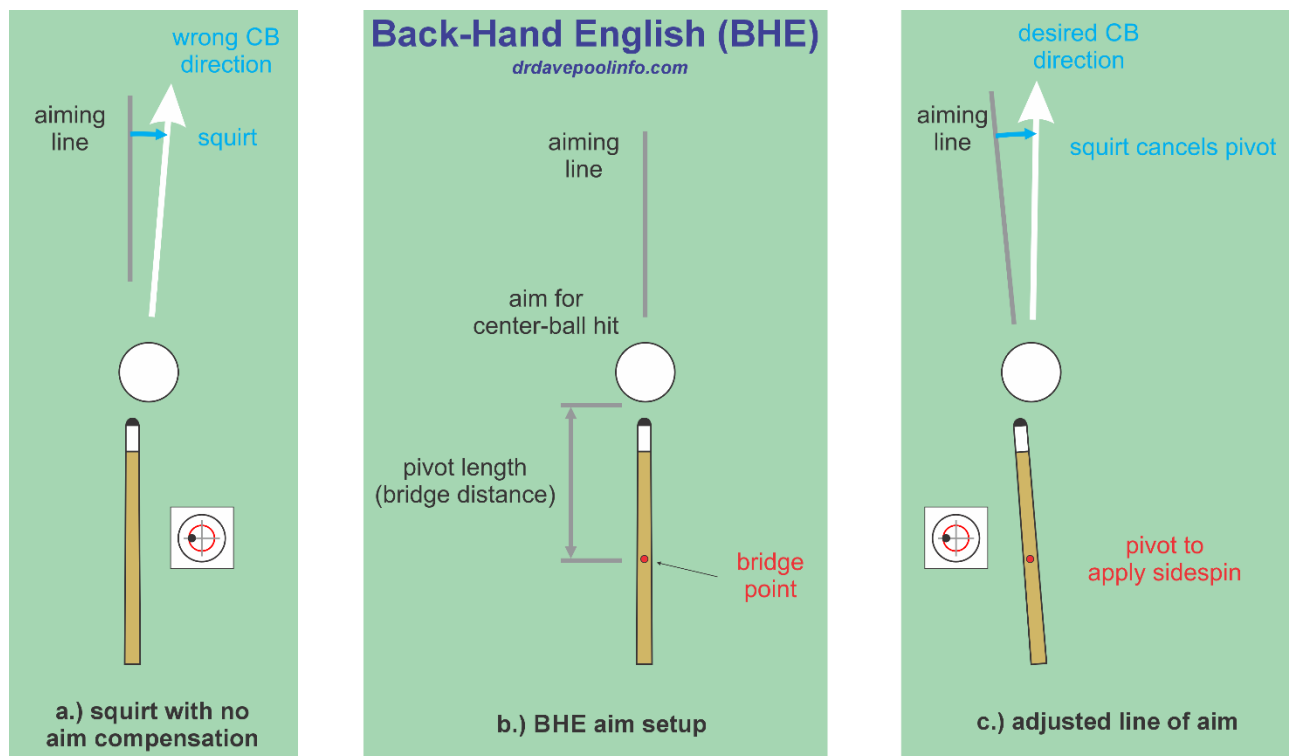
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In comments on recent videos online ([NV L.119](#) and [NV L.120](#)), it seems that many people think you should use a cue with a natural pivot length (described below) well matched to your preferred bridge length (see **Image 1**). In response to this, I posted a follow-up video ([NV L.121](#)) to clearly show why this is not good advice, except maybe for a break cue. I'll summarize the key points here.



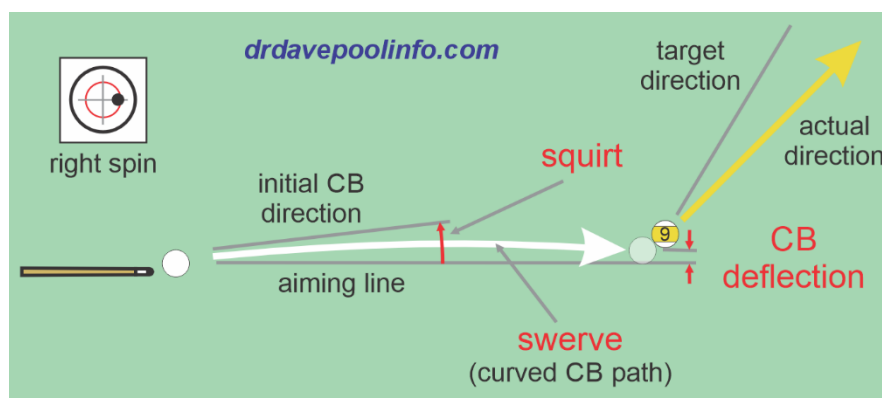
**Image 1 Bridge length**

First, we need to understand Back-Hand English or BHE (see **Image 2**). With BHE, you first aim with center-ball alignment with the cue pointing in the desired cue ball (CB) direction (see **Image 2a**). Then you pivot your back or grip hand while keeping the bridge hand still (see **Image 2c**). If the bridge or pivot length (see **Image 2b**), is just right for the given cue and shot, the pivot angle will exactly cancel squirt, sending the CB in the desired direction. See online video [NV L.121](#) for demonstrations.



**Image 2 Back-hand english (BHE)**

The Natural Pivot Length (NPL) is the bridge length required for BHE to give the correct line of aim for very fast and short shots, where swerve (which depends on cloth conditions) is not a factor. **Image 3** illustrates squirt, swerve, and CB deflection. When you use sidespin, the CB does not go in the direction the cue is pointing. With right spin, the CB squirts to the left and swerves back some, resulting in net CB deflection at the object ball (OB). All cue shafts, including the best low deflection (LD) carbon-fiber (CF) shafts on the market result in CB deflection, and you need to be able to adjust your aim accordingly based on shot speed and distance, and the amount of type of spin.



**Image 3 Squirt, swerve, and CB deflection**

To find the NPL for any shaft, just set up a short to medium distance shot straight into a pocket with two pocket "sentinel" balls that barely allow the CB to pass, as shown in **Image 4**. With an accurate center-ball hit, the CB will enter the pocket without disturbing the sentinel balls. The tricky part is to do this when using sidespin. As demonstrated in the video, if the bridge length is just the right distance, pure BHE will automatically cancel squirt and send the CB into the heart of the pocket. This bridge length is called the NPL of the shaft.



**Image 4 Natural pivot length**

For an accurate NPL measurement, you need to use very fast speed so the CB will not have time to swerve. You can use any amount of sidespin, but the test is more accurate if you use close to maximum sidespin. As demonstrated in the video, when the bridge length is too short, BHE overcompensates for squirt; so, with right sidespin, the CB will go too far to the shooter's right, causing the CB to hit the 7 first. If this happens, increase the bridge length. If the bridge length is too long, the BHE pivot will not compensate the aim enough, causing the CB to hit the 4. If this happens, decrease the bridge length. Keep adjusting the bridge length until the CB splits the pocket. When it does, you have found the NPL for the shaft. See the video for advice on how to deal with long natural pivot lengths common in LD CF shafts.

If you have a powerful break, it is very useful to know the NPL of your break cue. For a very-fast-speed break, it helps to have shaft with an NPL at your preferred bridge length. By bridging at the NPL, if your aim is true and your bridge is still during the stroke, even if the cue goes offline during the stroke, you will still get an accurate hit. See the video for demonstrations. In other words, an unintentional pivot or swipe during the stroke will cancel the resulting CB deflection. I know this might seem too good to be true, but it works.

Bridging at the NPL allows for BHE aim compensation when using sidespin only for very fast speed shots over short distances. However, the NPL does not work at other shot distances and speeds. See the video for numerous demonstrations. Now, for any shot distance and speed, it is possible to find an "effective pivot length" that will work with BHE. Again, the video shows examples for a wide range of shots, all requiring different pivot lengths. To use BHE effectively over a wide range of shot speeds and distances, one needs to vary the bridge length quite a bit to match the effective pivot length for each shot. The type of spin, and cue elevation, also affect things. Again, see the video for demonstrations.

As mentioned earlier, many people think they should choose a shaft with an NPL well matched to their preferred bridge length. This does apply to a break cue, but not your playing cue. For most people, the advantages that LD and carbon fiber shafts provide (see the [CF resource page](http://drdavepoolinfo.com) at [drdavepoolinfo.com](http://drdavepoolinfo.com)) make them good choices for a playing cue. The NPLs for LD CF shafts are in the 20" range. The effective pivot lengths required to use BHE with these shafts over a wide range of shot speeds and distances would be off the charts. And nobody in their right mind would use bridge lengths this long. It is too difficult to stroke straight when the bridge length is too long, especially when using fast speed.

See online video [NV L.55](#) if you want advice on what bridge length you should use. The bottom line is you should use whatever bridge length you feel most comfortable with, realizing that a longer bridge provides advantages, but only if you can stroke straight over whatever length you choose. If you have trouble stroking straight consistently, check out the [stroke "best practices" page](#) at [drdavepoolinfo.com](http://drdavepoolinfo.com). Following the advice on that page can do wonders for your stroke. And if you can stroke straight, you don't need any BHE automatic

error correction by trying to use the effective pivot length appropriate for each shot speed and distance. Most players, especially intermediate level and above, don't have much issue with stroke straightness, so automatic stroke-pivot-error correction isn't really important (except with a power break shot where control can be an issue).

And don't keep buying new shafts and cues, hoping they will make you play better. News flash ... they won't. It ain't the cue ... It's you! When using sidespin, one can learn to adjust for CB deflection over a wide range of shots with any shaft and any bridge length, especially if using the System for Aiming With Sidespin or SAWS. For more information, see [SAWS resource page](#) at [drdavepoolinfo.com](http://drdavepoolinfo.com).

Good luck with your game,  
Dr. Dave



[NV L.55](#) – BRIDGE LENGTH Effects and Considerations

[NV L.119](#) – Which CARBON FIBER Shaft Has the LEAST Cue Ball DEFLECTION?

[NV L.120](#) – How do LOW-COST CARBON FIBER SHAFTS Perform Compared to the Best?

[NV L.121](#) – Benefits of Bridging at the EFFECTIVE PIVOT LENGTH of a Shaft

PS:

- I know other authors and I tend to use lots of terminology, and I know not all readers are totally familiar with these terms. If you ever come across a word or phrase you do not fully understand, please refer to the [online glossary](#) at [drdavepoolinfo.com](http://drdavepoolinfo.com).

*Dr. Dave is a PBIA Master Instructor, Dean of the Billiard University, and author of the book: [The Illustrated Principles of Pool and Billiards](#) and numerous instructional DVD series, all available at: [DrDaveBilliards.com](http://DrDaveBilliards.com).*