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Drill guide

Abstract

Disclosed herein are drill guides with a mechanism for use with different drills and with error resistance.

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Background/Summary

CROSS-REFERENCE TO RELATED APPLICATIONS (1) This application is a continuation of PCT Patent Application No. PCT/US2022/023597 filed Apr. 6, 2022, which claims priority to U.S. Provisional Application No. 63/172,444 filed Apr. 8, 2021, and titled DRILL GUIDE, which is hereby incorporated by reference in its entirety for any and all purposes.

BACKGROUND

(1) The spine provides mobility, support, and balance. Spinal injuries can be debilitating, and even small irregularities in the spine can cause devastating pain and loss of coordination. Surgical procedures can be performed to treat the spine. To perform a surgical procedure on the spine, drill guides can be used to prepare for bone anchor insertion in an area of interest of the spine.

SUMMARY

(2) Disclosures include surgical drill guides with an error resisting mechanism. The error resisting mechanism can be on a distal portion of drill guide and can allow easy manipulation by the user to securely engage different settings. Such settings can advantageously allow dynamic change of an internal diameter of the drill guide lumen. Such a drill guide can advantageously provide usage of and switching between different drill lengths and diameters (e.g., multiple different drill length and diameters). The error resisting mechanism can also advantageously resist a longer drill with larger diameter from being used when a shorter drill with a smaller diameter is selected to be used.

(3) An example mechanism on a drill guide for insertion of different drills and error prevent includes an elongate body with a base and an outer sleeve, wherein the outer sleeve is rotatable and

translatable with respect to the base to be in a first or second setting, an inner lumen within the elongate body, and an inner sleeve rotationally coupleable with the outer sleeve in the first or second setting thereby changing a diameter of the inner lumen, wherein, in the first setting, the inner lumen comprises a first diameter, and in the second setting, the inner lumen comprises a second diameter.
(4) Alternatively or additionally to any of the embodiments in this section, base may comprise a proximal profile coupleable with a distal profile of the outer sleeve.
(5) Alternatively or additionally to any of the embodiments in this section, one of the proximal profile and the distal profile comprises a groove, and the other of the proximal profile and the distal profile may comprise a tip that is coupleable to the groove in the first or second setting.
(6) Alternatively or additionally to any of the embodiments in this section, one of the proximal profile and the distal profile comprises two groove separated by about 180 degrees, and the other of the proximal profile and the distal profile may comprise two tips separated by about 180 degrees, the two tips coupleable to the grooves in the first or second setting.
(7) Alternatively or additionally to any of the embodiments in this section, the first setting corresponds to a first position of the outer sleeve and the second setting may correspond to a second position of the outer sleeve that is rotated at least 180 degrees relative to the first position.
(8) Alternatively or additionally to any of the embodiments in this section, the outer sleeve may be translatable proximally relative to the base.
(9) Alternatively or additionally to any of the embodiments in this section, the inner sleeve may comprise one or more channels in which one or more precision elements are configured to translate at least partly there through.
(10) Alternatively or additionally to any of the embodiments in this section, the precision element comprises one or more precision balls.
(11) Alternatively or additionally to any of the embodiments in this section, the one or more channels may start from an outer surface of the inner sleeve, and narrow to an inner surface of the inner sleeve.
(12) Alternatively or additionally to any of the embodiments in this section, the one or more precision balls may be distributed evenly along a circumference of the inner sleeve.
(13) Alternatively or additionally to any of the embodiments in this section, the one or more precision balls may comprise 3 precision balls separated by about 120 degrees.
(14) Alternatively or additionally to any of the embodiments in this section, the outer sleeve may comprise one or more pockets in an inner surface thereof.
(15) Alternatively or additionally to any of the embodiments in this section, in the first setting, the one or more pockets may be configured to hold at least a portion of the precision balls so that the one or more precision balls do not extend into the inner lumen.
(16) Alternatively or additionally to any of the embodiments in this section, in the second setting, the one or more pockets may not be aligned with the one or more precision balls so that the one or more precision balls extend into the inner lumen.
(17) Alternatively or additionally to any of the embodiments in this section, the first diameter is greater than the second diameter.
(18) Alternatively or additionally to any of the embodiments in this section, the first diameter may be configured to allow passage of a first drill with a first drill depth, and the second diameter may be configured to allow passage of a second drill with a second drill depth.
(19) Alternatively or additionally to any of the embodiments in this section, the first drill depth may be greater than the second drill depth.
(20) Alternatively or additionally to any of the embodiments in this section, the outer sleeve may be rotatable relative to the inner sleeve.
(21) Alternatively or additionally to any of the embodiments in this section, the outer sleeve may comprise one or more through windows, and the inner sleeve may comprise drill depth information

configured to be visible from the one or more through windows.
(22) Alternatively or additionally to any of the embodiments in this section, further including an energy biasing element configured to bias the outer sleeve distally toward the base.
(23) Alternatively or additionally to any of the embodiments in this section, the mechanism may be configured to prevent error in using a first drill or a second drill.
(24) Alternatively or additionally to any of the embodiments in this section, the mechanism may be configured to provide tactile, audio, or both feedback to a user when switching between the first setting and the second setting.
(25) Alternatively or additionally to any of the embodiments in this section, the mechanism may be configured for an iliac drilling, thoracolumbar drilling, or both.
(26) Alternatively or additionally to any of the embodiments in this section, the elongate body may be substantially cylindrical.
(27) Alternatively or additionally to any of the embodiments in this section, at least part of the inner sleeve may be substantially cylindrical.
(28) In another example, a drill guide with a mechanism for error prevention may include a mechanism on a proximal portion of the drill guide for inserting different drills and error prevention. The mechanism may include an elongate body with a base and an outer sleeve, wherein the outer sleeve is rotatable and translatable with respect to the base to be in a first or second setting, an inner lumen within the elongate body, and an inner sleeve rotationally coupleable with the outer sleeve in the first or second setting thereby changing a diameter of the inner lumen. In the first setting, the inner lumen comprises a first diameter, and in the second setting, the inner lumen may include a first drill with the first diameter and a first drill depth, a second drill with the second diameter and a second drill depth, wherein the first diameter is greater than the second diameter, and the first drill depth is greater than the second drill depth, a handle at the proximal end of the drill guide, the handle is coupleable to the first and second drill, a tracking array fixedly attached to the drill guide for surgical navigation of the drill guide, and a second handle removably coupled to the drill guide, wherein the second handle is couplable to the drill guide in a plurality of discrete positions.
(29) In a further example, a method includes providing a drill guide, providing a mechanism, coupling the mechanism to the drill guide, modifying a lumen diameter of a inner lumen of the mechanism from a first diameter to a second diameter, providing a drill having an outer drill diameter smaller than the first diameter and larger than the second diameter, inserting the drill into the inner lumen, and drilling bone with the drill.
(30) In a further example, a method includes providing a mechanism coupled to a drill guide, the mechanism having an elongate body with a base, an outer sleeve, an inner lumen within the elongate body, and an inner sleeve, changing a diameter within the inner lumen, wherein changing the diameter includes rotating the outer sleeve with respect to the base to transition the elongate body from a first setting corresponding to a first diameter to a second setting corresponding to a second diameter, and inserting a drill through the mechanism.
(31) Alternatively or additionally to any of the embodiments in this section, rotating the outer sleeve with respect to the base may include causing a proximal profile to leave alignment with a first groove and enter alignment with a second groove.
(32) Alternatively or additionally to any of the embodiments in this section, changing the diameter of the inner lumen further may include proximally translating the outer sleeve relative to the base.
(33) Alternatively or additionally to any of the embodiments in this section, the rotating of the outer sleeve may modify an area in which one or more balls can travel, and the one or more balls at least in part may define the diameter within the inner lumen.
(34) Alternatively or additionally to any of the embodiments in this section, the method may further include revealing a first drill depth indicia through a window of the outer sleeve, wherein changing the diameter within the inner lumen causes second drill depth indicia to be revealed through the

window.
(35) Alternatively or additionally to any of the embodiments in this section, the method may further include overcoming a bias force that urges the outer sleeve distally toward the base.
(36) Alternatively or additionally to any of the embodiments in this section, the method may further include resisting an error in using an incorrect drill by changing the diameter.
(37) Alternatively or additionally to any of the embodiments in this section, the method may further include performing one or both of iliac drilling and thoracolumbar drilling.
(38) Alternatively or additionally to any of the embodiments in this section, the method may further include coupling the mechanism to the drill guide.
(39) The above summary of some embodiments is not intended to describe each disclosed embodiment or every implementation of the present disclosure. The Figures, and Detailed Description, which follow, more particularly exemplify these embodiments.

Description

BRIEF DESCRIPTION OF THE DRAWINGS
(1) FIG. **1** shows a side view of an example drill guide with a mechanism for inserting different drills and error prevention.
(2) FIG. **2** shows an enlarged view of a portion of the drill guide depicted in box A of FIG. **1**.
(3) FIG. **3**A shows a perspective view of the mechanism of the drill guide.
(4) FIG. **3**B shows a perspective view of the mechanism of the drill guide with a portion of an outer sleeve omitted.
(5) FIG. **4**A shows a top view of the mechanism with a drill disposed in a lumen, where the drill is shown in cross-section at the top of the mechanism.
(6) FIG. **4**B shows a bottom view of the mechanism without the drill in the lumen.
(7) FIG. **5**A shows a side view of the mechanism at a second setting.
(8) FIG. **5**B shows a side view of the mechanism at a first setting.
(9) FIG. **6**A shows a cross-section view of an example mechanism in the second setting without the drill inserted.
(10) FIG. **6**B shows a cross-section view of the example mechanism in the second setting with the drill inserted into the drill guide.
(11) FIG. **6**C shows a cross-section view of an example of the mechanism in the first setting.
(12) FIG. **7**A shows a side view of the tracking array and the removable handle of the drill guide herein.
(13) FIG. **7**B shows a cross section view of the removable handle in FIG. **7**A.
(14) FIG. **8** illustrates a method.
DETAILED DESCRIPTION OF THE DISCLOSURE
(15) Disclosed drill guides can include an error resisting mechanism that permits rotation of an outer sleeve of the mechanism to securely engage different settings, such as the diameter of an inner lumen. The mechanism can permit the use of different drill depths and diameters with a single drill guide. This mechanism can be useful in preventing a longer drill with larger diameter from being used when a shorter drill with a smaller diameter is selected to be used or needed. For example, drill bits having longer lengths may have larger diameters. The mechanism may permit a user to select a desired drill length by setting the diameter of the inner lumen. Such a step can prevent or resist the inadvertent use of a longer than desired drill.
(16) Disclosed mechanisms can be compatible with traditional drill guides and can advantageously provide error prevention and insertion of different drills. The mechanism can include an outer sleeve that rotates between two or more discrete settings. For example, the rotation can be across a predetermined range (e.g., 180 degrees). The outer sleeve can have one or more windows to permit

a user to see information, such as drill depth. The outer sleeve can have multiple pocket features. These pocket features can either align or not align with precision elements captured between the outer sleeve and an inner sleeve defining the inner lumen for passing drills therethrough. When the outer sleeve is aligned with a first setting (e.g., about 15 mm to about 45 mm) the pocket features do not align with the precision elements (e.g., precision balls), the outer sleeve can force the precision elements inward thereby reducing the internal diameter of the inner lumen. This reduction then will only allow about 15 mm to about 45 mm drill to pass through and be used. When the outer sleeve is pulled and rotated (e.g., for about 180 degrees), pockets align with the precision balls, allowing the precision balls to fall into these pockets thereby allowing the internal diameter of the drill guide to increase. The increased diameter then can allow about 60 mm to about 90 mm drill to be inserted. The mechanism can be integral with a drill guide or be attached to an existing drill guide. A drill guide can be configured for particular procedures, such as iliac procedures, thoracolumbar procedures, or both.

(17) FIGS. **1** and **2** show an example implementation a drill guide **100**. The drill guide **100** includes a mechanism **200** for inserting different drills and for error resistance. In the illustrated example, the mechanism **200** is part of the drill guide **100** and coupled with a connector **401** of the drill guide **100**. The coupling can be achieved through any of a variety of mechanism, such as via user-releasable couplings (e.g., screw-fit or snap-fit mechanism) or unreleasable couplings (e.g., via one or more welds or integral bonds). The drill guide **100** can also include a tracking array **300** for surgical navigation, such as by including multiple active or passive fiducials. A handle **500** for inserting a drill **600** can also be included, such as by being inserted through the drill guide **100**. Another removable handle **400** can also be fixedly attached to the drill guide **100** for facilitating control of the drill guide **100** without interference with the drill handle **500**.

(18) FIG. **2** shows an enlarged view of the contents of box-A in FIG. **1**, which include at least portions of the mechanism **200**, the tracking array **300**, and the removable handle **400**. Additional details regarding the mechanism **200** are provided in FIGS. **3**A and **3**B, below.

(19) FIGS. **3**A and **3**B show the mechanism **200** in perspective views, with and without a cap **201***a* of an outer sleeve **201**, respectively. FIGS. **4**A and **4**B further show an inner lumen **207** of the mechanism **200**.

(20) The mechanism **200** includes an elongate body **200***a* that can be substantially cylindrical. Other geometric shapes can be used for the elongate body **200***a*. The elongate body **200***a* includes a base **202**. The outer sleeve **201** of the mechanism **200** is disposed proximal to the base **202** and includes the cap **201***a* at a proximal portion of the outer sleeve **201**. The cap **201***a* can be fixedly or releasably coupled to the rest of the outer sleeve **201**. The outer sleeve **201** is rotatable (e.g., by a user or a robotic arm) with respect to the base **202**, to allow the mechanism **200** to be selectively disposed in one of a plurality of different settings, such as a first setting or a second setting. The outer sleeve **201** can be rotatable in one or more directions. In some implementation, the outer sleeve **201** is translatable along a proximal-distal axis of the mechanism **200**. The outer sleeve **201** can be translated proximally by a user when the user is transitioning between the first and second setting. In an example, the outer sleeve is **201** is blocked from substantially rotation until the outer sleeve **201** is first translated proximally.

(21) The outer sleeve **201** can include a distal profile **201***b* at its distal end. The base **202** can include a proximal profile **202***b* at the proximal end of the base **202**. The distal profile **201***b* and the proximal profile **202***b* can be a complementary geometric or other features configured to couple with each other when the mechanism is in a particular setting (e.g., the first or second setting as a result of being aligned in a particular manner). The distal profile **201***b* and the proximal profile **202***b* can be coupled with each other, in the first setting, and the second setting, respectively (e.g., as shown in more detail in FIGS. **5**A and **5**B). In the illustrated example, one of the proximal profile **202***b* and the distal profile **201***b* includes two grooves **211** (e.g., only one groove **211** is depicted at a time in the FIGS.) separated about 180 degrees, and the other of the proximal profile

202*b* and the distal profile **201***b* includes two matching tips **213** (e.g., only one tip **213** is depicted at a time in the FIGS.) coupleable with the two grooves **211**. In other implementations, the proximal profile **202***b* and the distal profile **201***b* can take other forms, such as a ball-and-detent configuration. The distal profile **201***b* and the proximal profile **202***b* can disengage from each other when the mechanism is in none of the settings but in a transitioning stage. At the transitioning stage, the outer sleeve **201** can be translated proximally away from the base **202**, with or without rotational movements relative to the base **202**.

(22) The mechanism **200** can include an inner sleeve **203** rotationally coupleable with the outer sleeve **201** in the settings (e.g., the first or second setting). The inner sleeve **203** can include one or more channels **204** in which one or more precision elements **205** are configured to translate at least partly therethrough.

(23) The mechanism **200** can include an inner lumen **207** within the elongate body **200***a*, as shown in FIGS. **4**A and **4**B. The inner lumen **207** can allow a drill or other cylindrical tool to be inserted therethrough. The diameter of the inner lumen **207** can define the maximum size of the drill **600** that can fit therethrough.

(24) In a first setting, the inner lumen **207** can have a first diameter d**1** of the cross-section that is greater than a second diameter d**2** in the second setting. The first diameter can allow passage of a first drill with a first drill depth, and the second diameter is configured to allow passage of a second drill with a second drill depth. The first drill depth can be greater than the second drill depth. When in the second setting, second diameter can resist the insertion of the first drill cannot be inserted into the drill guide, thereby preventing error of using a drill guide with a larger diameter and/or drill depth than needed.

(25) The outer sleeve **201** can define one or more windows **208**. The windows **208** can be areas through which the inner sleeve **203** is visible. The inner sleeve **203** can include drill depth or drill diameter information **209** configured to be visible from the window(s) **208**. In the first setting, a user can see the drill depth or diameter information as shown in FIG. **5**B, while in a second setting, a smaller drill depth or diameter information that is smaller can be seen through the window **208**, as in FIG. **5**A. Besides the visible drill depth or diameter information **209**, the mechanism **200** may also provide tactile, audio, or both feedback to a user when the user is switching between the first and second settings.

(26) The mechanism **200** may include an energy biasing element **210** (e.g., a spring) configured to bias the outer sleeve distally toward the base, especially when the user pulls the outer sleeve proximally to switch between settings, the energy biasing element **210** may facilitate the switching by biasing the outer sleeve **201** to couple distally to the base **202**.

(27) The mechanism **200** further includes an actuatable button **302**. As shown in more detail in FIGS. **6**A and **6**B, the actuatable button **302** can be part of a mechanism to capture a portion of the drill **600** (e.g., a sleeve thereof). Actuation of the actuatable button **302** can permit release of the drill **600**.

(28) FIGS. **6**A-**6**C show cross-sectional views of the mechanism **200** at different settings. FIGS. **6**A and **6**B show the mechanism at the second setting, and FIG. **6**C shows the mechanism at the first setting. As can be seen in FIG. **6**B, one or more channels **204** can start from an outer surface **203***a* of the inner sleeve **203**, and narrow to an inner surface **203***b* of the inner sleeve **203**. The one or more channels **204** can be distributed evenly along a circumference of the inner sleeve **203**. In this particular embodiment, three channels are separated evenly for about 120 degrees. The one or more precision elements **205** can also be distributed evenly along a circumference of the inner sleeve, as shown in FIGS. **4**A-**4**B, separated for about 120 degrees. In this embodiment, the precision elements **205** are precision balls. In an example, the precision elements are “precision” in that they are precisely manufactured to meet tolerances for the application in which they are used. The outer sleeve **201** can have one or more pockets **206** in an inner surface thereof, and each pocket **206** can hold one precision element **205** there within when aligned, as shown in FIGS. **6**A-**6**C. For example,

the one or more pockets **206** can provide room for the precision elements **205** (e.g., precision balls, as depicted) to travel to permit an increase in the size of the diameter within the inner lumen **207**. The mechanism **200** herein can include two or more different settings that a user may select from and conveniently transition between. In another example, the one or more pockets **206** can be in the form of steps or a ramp to provide different amounts of space to gradually or discontinuously provide diameter changes.

(29) Referring to FIG. **6**C, in the first setting, the one or more pockets **206** are configured to hold at least a portion of the one or more precision elements **205** so that the precision elements **205** do not extend inward into the inner lumen **207**. The channels **204** can include a slope to facilitate the precision element **205** falling into the pocket **206** when the pocket **206** and the precision element **205** are aligned. In the second setting, when the outer sleeve **201** is rotated for about 180 degrees, as shown in FIGS. **6**A and **6**B, the one or more pockets **206**, after the rotation, are not aligned with any of the precision elements **205** so that the precision elements **205** extend into the inner lumen **207**. FIGS. **6**A and **6**B show the mechanism **200** at the first setting with and without the drill **600** inserted.

(30) FIGS. **7**A and **7**B show an example removable handle **400** usable with the mechanism **200** (not depicted in FIGS. **7**A and **7**B), where FIG. **7**A depicts a side view of the example removable handle **400** and FIG. **7**B depicts a cross-sectional view of the example removable handle **400**. The handle **400** may be coupled to the mechanism **200** via a connector **401**. The connector **401** can be fixedly or adjustably coupled to the mechanism **200**. The same connector **401** may enable the tracking array **300** to be fixedly attached thereon. The handle **400** may extend in a direction that is not along the proximal to distal direction. The handle **400** may have a fixed tilt angle from the proximal to distal direction. The connector **401** can include multiple coupling elements **402** that allow a user to attach the handle **400** to the drill guide **100**. The handle can include a matching element **403** that can removably and fixedly attach to the coupling element **402**. The coupling can be locked or unlocked using a quick release switch **403***a*. The connector **401** and handle **400** advantageously allow a user to couple the handle at one of the many discrete positions provided by the coupling elements **402** to maximize operational convenience and efficiency of the drill guide **100**.

(31) FIG. **8** illustrates an example method **800** that includes operation **810**, operation **820**, and operation **830**.

(32) Operation **810** includes providing a mechanism **200** coupled to a drill guide **100**. The mechanism **200** having an elongate body with a base **202**, an outer sleeve **201**, an inner lumen **207** within the elongate body, and an inner sleeve **203**. In some examples, the mechanism **200** and drill guide **100** are integral. In some implementations, the method **800** can further include coupling the mechanism **200** to the drill guide **100**, such as using a threaded or snap connector.

(33) Operation **820** includes changing a diameter within the inner lumen **207**. The operation **820** can include rotating the outer sleeve **201** with respect to the base **202** to transition the elongate body from a first setting corresponding to a first diameter to a second setting corresponding a second diameter. Rotating the outer sleeve **201** with respect to the base **202** can include causing a proximal profile **202***b* to leave alignment with a first groove and enter alignment with a second groove. The rotating of the outer sleeve **201** modifies an area in which one or more balls can travel, with the one or more balls at least in part define the diameter within the inner lumen. The operation **820** can include changing the diameter of the inner lumen **207** further includes proximally translating the outer sleeve **201** is relative to the base **202**.

(34) Operation **830** includes inserting a drill **600** through the mechanism **200**.

(35) In some examples, the method **800** further includes revealing a first drill depth indicia through a window **208** of the outer sleeve **201** and changing the diameter within the inner lumen **207** causes second drill depth indicia to be revealed through the window **208**. The method **800** can further include overcoming a bias force that urges the outer sleeve **201** distally toward the base **202**. The method **800** can include or result in resisting an error in using an incorrect drill by changing the

diameter. The method **800** can include performing one or both of iliac drilling and thoracolumbar drilling while the drill **600** is inserted through the mechanism **200**.
(36) As disclosed herein, “proximal” indicates the direction away from attachment of an element to the subject, while “distal” indicates the direction opposite proximal direction and toward attachment of an element to the subject.
(37) Unless otherwise defined, all technical terms used herein have the same meaning as commonly understood by one of ordinary skill in the art to which this invention belongs. As used in this specification and the appended claims, the singular forms “a,” “an,” and “the” include plural references unless the context clearly dictates otherwise. Any reference to “or” herein is intended to encompass “and/or” unless otherwise stated. As used in this specification and the claims, unless otherwise stated, the term “about,” “approximately,” “generally,” and “substantially” refers to variations of less than or equal to +/−1%, +/−2%, +/−3%, +/−4%, +/−5%, +/−6%, +/−7%, +/−8%, +/−9%, +/−10%, +/−11%, +/−12%, +/−14%, +/−15%, +/−16%, +/−17%, +/−18%, +/−19%, or +/−20%, depending on the embodiment. As a further non-limiting example, about 100 millimeters represents a range of 95 millimeters to 105 millimeters, 90 millimeters to 110 millimeters, or 85 millimeters to 115 millimeters, depending on the embodiments.
(38) While preferred embodiments of the present invention have been shown and described herein, it will be obvious to those skilled in the art that such embodiments are provided by way of example only. Numerous variations, changes, and substitutions will now occur to those skilled in the art without departing from the invention. It should be understood that various alternatives to the embodiments of the invention described herein may be employed in practicing the invention. It is intended that the following claims define the scope of the invention and that methods and structures within the scope of these claims and their equivalents be covered thereby.

Claims

1. A mechanism on a drill guide for insertion of different drills and error prevention, the mechanism comprising: an elongate body with a base and an outer sleeve, wherein the outer sleeve is rotatable and translatable with respect to the base to be in a first or second setting; an inner lumen within the elongate body; and an inner sleeve rotationally coupleable with the outer sleeve in the first or second setting thereby changing a diameter of the inner lumen, wherein, in the first setting, the inner lumen comprises a first diameter, and in the second setting, the inner lumen comprises a second diameter; wherein the outer sleeve comprises a window and the inner sleeve comprises first and second indicia; wherein the first indicia can be revealed in the window; and wherein changing the diameter within the inner lumen causes the second indicia to be revealed through the window.
2. The mechanism of claim 1, wherein the base comprises a proximal profile coupleable with a distal profile of the outer sleeve.
3. The mechanism of claim 2, wherein one of the proximal profile and the distal profile comprises a groove, and the other of the proximal profile and the distal profile comprises a tip that is coupleable to the groove in the first or second setting.
4. The mechanism of claim 2, wherein one of the proximal profile and the distal profile comprises two grooves separated by about 180 degrees, and the other of the proximal profile and the distal profile comprises two tips separated by about 180 degrees, the two tips coupleable to the grooves in the first or second setting.
5. The mechanism of claim 1, wherein the first setting corresponds to a first position of the outer sleeve and the second setting corresponds to a second position of the outer sleeve that is rotated at least 180 degrees relative to the first position.
6. The mechanism of claim 1, wherein the outer sleeve is translatable proximally relative to the base.
7. The mechanism of claim 1, wherein the inner sleeve comprises one or more channels in which

one or more precision elements are configured to translate at least partly there through.
8. The mechanism of claim 7, wherein the one or more precision elements comprises one or more precision balls.
9. The mechanism of claim 7, wherein the one or more channels start from an outer surface of the inner sleeve, and narrow to an inner surface of the inner sleeve.
10. The mechanism of claim 8, wherein the one or more precision balls are distributed evenly along a circumference of the inner sleeve.
11. The mechanism of claim 8, wherein the one or more precision balls comprises 3 precision balls separated by about 120 degrees.
12. The mechanism of claim 8, wherein the outer sleeve comprises one or more pockets in an inner surface thereof.
13. The mechanism of claim 12, wherein, in the first setting, the one or more pockets are configured to hold at least a portion of the precision balls so that the one or more precision balls do not extend into the inner lumen.
14. The mechanism of claim 12, wherein, in the second setting, the one or more pockets are not aligned with the one or more precision balls so that the one or more precision balls extend into the inner lumen.
15. A method comprising: providing a drill guide; providing a mechanism; coupling the mechanism to the drill guide; modifying a lumen diameter of an inner lumen of the mechanism from a first diameter to a second diameter; providing a drill having an outer drill diameter smaller than the first diameter and larger than the second diameter; inserting the drill into the inner lumen; revealing a first indicia through a window of an outer sleeve, wherein changing the diameter within the inner lumen causes second indicia to be revealed through the window; and drilling bone with the drill.
16. A method comprising: providing a mechanism coupled to a drill guide, the mechanism having an elongate body with a base, an outer sleeve, an inner lumen within the elongate body, and an inner sleeve; changing a diameter within the inner lumen, wherein changing the diameter includes rotating the outer sleeve with respect to the base to transition the elongate body from a first setting corresponding to a first diameter to a second setting corresponding to a second diameter; and inserting a drill through the mechanism; revealing a first indicia through a window of the outer sleeve, wherein changing the diameter within the inner lumen causes second indicia to be revealed through the window.
17. The method of claim 16, wherein rotating the outer sleeve with respect to the base includes: causing a proximal profile to leave alignment with a first groove and enter alignment with a second groove.
18. The method of claim 16, wherein changing the diameter of the inner lumen further includes: proximally translating the outer sleeve relative to the base.
19. The method of claim 16, wherein the rotating of the outer sleeve modifies an area in which one or more balls can travel; and wherein the one or more balls at least in part define the diameter within the inner lumen.