**Open Advanced Skills Curriculum (aka “Open 3”)**

**Task 1: Knot-tying, no tension, 2-handed**

**Description:** Tie a 46 cm 4-0 silk ligature around 5 mm colored segment on thick single rubber tubing using only a 2-handed technique, 3 square knots, time starts with tie in place, not crossed, 1 end in each hand . Surgical gloves are worn at all times.

**Errors:**

Accuracy = distance in mm tied outside of colored segment on tubing piece

Gap (Air Knot) = distance in mm between ligature and rubber tubing (1 point for gap)

Slippage = 0 points for secure knot, 1 point for slippage > 3mm, 1 point for disruption *(measure by cutting tails to 1 cm and "bursting" the knot using pointed scissors)*

Breakage = 1 points if ligature is broken during any portion of exercise

**Proficiency Score: 11 seconds**

**Proficiency Training Protocol:** Achieve proficiency score on 2 consecutive repetitions (max 80 repetitions)

**Proficiency Testing (Pre-test and Post-test) Protocol:** 1 repetition

**Trainee Scores:**

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| **Mark: Pre-test,****Training, or Posttest** | **Date** | **Repetition #** | **Time** | **Accuracy error**  | **Gap error**  | **Slippage error** | **Breakage error**  |
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**Task 2: Knot-tying, no tension, 1-handed**

**Description:** Description Tie a 46 cm 4-0 silk ligature around 5 mm colored segment on thick single rubber tubing using only a 1-handed technique, 3 square knots .Time starts with tie in place, not crossed, 1 end in each hand. Surgical gloves worn at all times.

**Errors:**

Accuracy = distance in mm tied outside of colored segments on the tubing piece

Gap (Air Knot) = distance in mm between ligature and rubber tubing (1 point for gap)

Slippage = 0 points for secure knot, 1 point for slippage > 3mm, 1 point for disruption *(measure by cutting tails to 1 cm and "bursting" the knot using pointed scissors)*

Breakage = 1 points if ligature is broken during any portion of exercise

**Proficiency Score: 7 seconds**

**Proficiency Training Protocol:** Achieve proficiency score on 2 consecutive repetitions (max 80 repetitions)

**Proficiency Testing (Pre-test and Post-test) Protocol:** 1 repetition

**Trainee Scores:**

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| **Mark: Pre-test,****Training, or Posttest** | **Date** | **Repetition #** | **Time** | **Accuracy error** | **Gap error**  | **Slippage error**  | **Breakage error** |
| **Pretest** |  |  |  |  |  |  |  |
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**Task 3: Knot –tying, no tension, 1- handed, non-dominant hand**

**Description:**  Tie a 46 cm 4-0 silk ligature around 5 mm colored segment on thick single rubber tubing using only a 1-handed technique and the non-dominant hand , 3 square knots .Time starts with tie in place, not crossed, 1 end in each hand. Surgical gloves worn at all times.

**Errors:**

Accuracy = distance in mm tied outside of colored segment on tubing piece

Gap (Air Knot) = distance in mm between rubber tubing segments (1 point for gap)

Slippage = 0 points for secure knot, 1 point for slippage > 3mm, 1 point for disruption *(measure by cutting tails to 1 cm and "bursting" the knot using pointed scissors)*

Breakage = 1 point if ligature is broken during any portion of exercise

**Proficiency Score: 13 seconds**

**Proficiency Training Protocol:** Achieve proficiency score on 2 consecutive repetitions (max 80 repetitions)

**Proficiency Testing (Pre-test and Post-test) Protocol:** 1 repetition

**Trainee Scores:**

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| **Mark: Pre-test,****Training, or Posttest** | **Date** | **Repetition #** | **Time** | **Accuracy error** | **Gap error** | **Slippage error**  | **Breakage error**  |
| **Pretest** |  |  |  |  |  |  |  |
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| **Posttest** |  |  |  |  |  |  |  |

**Task 4: Knot-tying, under tension, 1-handed, slip knot**

**Description** Tie a 46 cm 4-0 silk ligature around the 5 mm colored segments to approximate the thick double rubber tubing set using only a 1-handed technique, slip knot on first 2 throws then 2 square throws (4 knots total). Time starts with tie in place, not crossed, 1 end in each hand. Time stops when last knot is tied. Surgical gloves are worn at all times.

**Errors:**

Accuracy = distance in mm tied outside of colored segments on each tubing piece

Gap (Air Knot) = distance in mm between rubber tubing segments (1 point for gap)

Slippage = 0 points for secure knot, 1 point for slippage > 3mm, 1 point for disruption *(measure by cutting tails to 1 cm and "bursting" the knot using pointed scissors)*

Breakage = 20 points if ligature is broken during any portion of exercise

**Proficiency Score: 10 seconds**

**Proficiency Training Protocol:** Achieve proficiency score on 2 consecutive repetitions (max 80 repetitions)

**Proficiency Testing (Pre-test and Post-test) Protocol:** 1 repetition

**Trainee Scores:**

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| **Mark: Pre-test,****Training, or Posttest** | **Date** | **Repetition #** | **Time** | **Accuracy error** | **Gap error**  | **Slippage error** | **Breakage error**  |
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| **Posttest** |  |  |  |  |  |  |  |

**Task 5: Knot-tying, under tension, 1-handed, slip knot, non-dominant hand**

**Description:** Tie a 46 cm 4-0 silk ligature around 5 mm colored segments to approximate thick double rubber tubing set using only a 1-handed technique and the non-dominant hand. Tie a slip knot on first 2 throws then 2 square throws (4 knots total).Time starts with tie in place, not crossed, 1 end in each hand. Time stops when last knot is tied. Surgical gloves worn at all times.

**Errors:**

Accuracy = distance in mm tied outside of colored segments on each tubing piece

Gap (Air Knot) = distance in mm between rubber tubing segments (1 point for gap)

Slippage = 0 points for secure knot, 1 point for slippage > 3mm, 1 point for disruption *(measure by cutting tails to 1 cm and "bursting" the knot using pointed scissors)*

Breakage = 1 point if ligature is broken during any portion of exercise

**Proficiency Score: 23 seconds**

**Proficiency Training Protocol:** Achieve proficiency score on 2 consecutive repetitions (max 80 repetitions)

**Proficiency Testing (Pre-test and Post-test) Protocol:** 1 repetition

**Trainee Scores:**

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| **Mark: Pre-test,****Training, or Posttest** | **Date** | **Repetition #** | **Time** | **Accuracy error** | **Gap error**  | **Slippage error**  | **Breakage error**  |
| **Pretest** |  |  |  |  |  |  |  |
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| **Posttest** |  |  |  |  |  |  |  |

**Task 6: Knot-tying, under tension, 2-handed, surgeon’s knot**

**Description:** Tie a 46 cm 4-0 silk ligature around the 5 mm colored segments to approximate the thick double rubber tubing set using only a 2-handed technique, surgeon’s knot then 2 squares (3 knots total). Time starts with tie in place, not crossed, 1 end in each hand.

**Errors:**

Accuracy = distance in mm tied outside of colored segments on each tubing piece

Gap (Air Knot) = distance in mm between rubber tubing segments (1 point for gap)

Slippage = 0 points for secure knot, 1 point for slippage > 3mm, 1 point for disruption *(measure by cutting tails to 1 cm and "bursting" the knot using pointed scissors)*

Breakage = 1 point if ligature is broken during any portion of exercise

**Proficiency Score: 16 seconds**

**Proficiency Training Protocol:** Achieve proficiency score on 2 consecutive repetitions (max 80 repetitions)

**Proficiency Testing (Pre-test and Post-test) Protocol:** 1 repetition

**Trainee Scores:**

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| **Mark: Pre-test,****Training, or Posttest** | **Date** | **Repetition #** | **Time** | **Accuracy error**  | **Gap error** | **Slippage error**  | **Breakage error**  |
| **Pretest** |  |  |  |  |  |  |  |
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| **Posttest** |  |  |  |  |  |  |  |

**Task 7: Knot-tying, under tension, 2-handed, slip knot**

**Description:** Tie a 46 cm 4-0 silk ligature around the 5 mm colored segments to approximate the thick double rubber tubing set using only a 2-handed technique, slip knot on first 2 throws then 2 square throws (4 knots total). Time starts with tie in place, not crossed, 1 end in each hand. Time stops when last knot is tied. Surgical gloves worn throughout activity.

**Errors:**

Accuracy = distance in mm tied outside of colored segments on each tubing piece

Gap (Air Knot) = distance in mm between rubber tubing segments (1 point for gap)

Slippage = 0 points for secure knot, 1 point for slippage > 3mm, 1 point for disruption *(measure by cutting tails to 1 cm and "bursting" the knot using pointed scissors)*

Breakage = 1 point if ligature is broken during any portion of exercise

**Proficiency Score: 14 seconds**

**Proficiency Training Protocol:** Achieve proficiency score on 2 consecutive repetitions (max 80 repetitions)

**Proficiency Testing (Pre-test and Post-test) Protocol:** 1 repetition

**Trainee Scores:**

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| **Mark: Pre-test,****Training, or Posttest** | **Date** | **Repetition #** | **Time** | **Accuracy error**  | **Gap error**  | **Slippage error**  | **Breakage error**  |
| **Pretest** |  |  |  |  |  |  |  |
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| **Posttest** |  |  |  |  |  |  |  |

**Task 8: Tie at depth**

**Description:** Place 4-0 silk ligature around a post (enclosed in a plastic cup) between the ball and the black line (1mm) on the Ethicon knot-tying model and tie 3 square knots (either 1- or 2-handed). Time starts with 1 end of the tie in each hand, outside the cup; time stops with completion of the final knot. Surgical gloves worn at all times.

**Errors:**

Accuracy = distance in mm if tied outside of target zone

Gap (air knot) =distance in mm between ligature and rubber tubing /if ligature can be slid/moved along post (1 point for gap)

Slippage = 0 points for secure knot , 1 point for slippage > 3mm, 1 point for disruption (measure by cutting tails to 1 cm and trying to burst the knot using pointed scissors) .

Breakage= 1 point if ligature is broken during any portion of exercise

**Proficiency Score: 15 seconds**

**Proficiency Training Protocol:** Achieve proficiency score on 2 consecutive repetitions (max 80 repetitions)

**Proficiency Testing (Pre-test and Post-test) Protocol:** 1 repetition

**Trainee Scores:**

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| **Mark: Pre-test,****Training, or Posttest** | **Date** | **Repetition #** | **Time** | **Accuracy error** | **Gap error**  | **Slippage error**  | **Breakage error**  |
| **Pretest** |  |  |  |  |  |  |  |
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| **Posttest** |  |  |  |  |  |  |  |

**Task 9: Tie at depth using non-dominant hand (1-handed)**

**Description** Place 4-0 silk ligature around a post (enclosed in a plastic cup) between the ball and the black line (1mm) on the Ethicon knot-tying model and tie 3 square knots (1- handed) using non-dominant hand. Time starts with 1 end of the tie in each hand, outside the cup; time stops with completion of the final knot. Surgical gloves worn at all times.

**Errors:**

Accuracy = distance in mm if tied outside of target zone (1 point for lack of accuracy)

Gap (air knot) =distance in mm between ligature and rubber tubing /if ligature can be slid/moved along post (1 point for gap)

Slippage = 0 points for secure knot , 1 point for slippage > 3mm, 1 point for disruption (measure by cutting tails to 1 cm and trying to burst the knot using pointed scissors) .

Breakage = 1 point if ligature is broken during any portion of exercise

**Proficiency Score: 23 seconds**

**Proficiency Training Protocol:** Achieve proficiency score on 2 consecutive repetitions (max 80 repetitions)

**Proficiency Testing (Pre-test and Post-test) Protocol:** 1 repetition

**Trainee Scores:**

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| **Mark: Pre-test,****Training, or Posttest** | **Date** | **Repetition #** | **Time** | **Accuracy error**  | **Gap error** | **Slippage error**  | **Breakage error** |
| **Pretest** |  |  |  |  |  |  |  |
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