**Hypothesis**

- Information on suturing methods strictly includes the connection of derma.
- There is a lack of records and public material regarding different techniques and terminology of suturing in catheters to patients, particularly in interventional radiology (IR).
- If we created documentation of medical specialists suturing a variety of catheters to patients, then there would be numerous benefits, including:
  - An established record of various techniques novices could reference.
  - An archive for academic researchers to access for the fabrication of further analysis.

**Methodology**

- Our initial research concluded the most commonly practiced techniques of suturing skin-to-skin included the continuous stitch, simple interrupted stitch, mattress stitch (both vertical and horizontal), and purse string stitch.
- Photographs were taken of patients with protruding catheters sutured into their chests by IR specialists.
- Both the patient’s and physician’s consent were required in order to document the photographs.
- The photographs were compared for commonalities between specialist’s techniques, as well as to general sutures well-known to the medical field.

**Data**

- Eight different patients consented to participate in this study.
  - A total of 21 pictures were taken.
  - Ten IR specialists took part in this study, granting consent for their patients to be photographed, and/or suturing in the catheters.
  - Three types of catheters were documented. They include:
    - **Tunneled catheter** – A catheter placed below the collarbone on the chest for long-term central venous access.
      - Commonly placed in the right subclavian vein or right jugular vein.
      - Also known as a central venous catheter (CVC).
    - **Dialysis catheter** – A catheter used for exchanging blood by a hemodialysis machine for patients with poor kidney function.
      - Commonly placed in the right jugular vein and thread through the superior vena cava (SVC).
    - **Pheresis catheter** – A catheter used for pheresis of stem cells; treatment of blood disorders; and infusions of hydration, transfusions, or medications.
      - Commonly placed in the right jugular vein.

**Results**

1. **Tunneled Hickman catheter**
   - Horizontal mattress suture
   - 4 surgical knots
2. **Tunneled Hickman catheter**
   - Horizontal mattress suture
   - 3 surgical knots
3. **Tunneled Hickman catheter**
   - Subclavian suture
   - 3 surgical knots
4. **Dialysis catheter**
   - Subclavian suture
   - No surgical knots on catheter; 1 surgical knot on hub/wings
5. **Tunneled CV catheter**
   - Horizontal mattress suture
   - 2 surgical knots on catheter; 1 surgical knot on hub/wings
6. **Dialysis catheter**
   - Vertical mattress suture
   - 2 surgical knots on catheter; 1 surgical knot on hub/wings
7. **Tunneled catheter**
   - Purse-string suture
   - 3 surgical knots on catheter; 1 surgical knot on hub/wings
8. **Tunneled catheter**
   - Purse-string suture
   - 3 surgical knots on catheter; 1 surgical knot on hub/wings

**Conclusions**

- Unlike our original prediction, there were multiple commonalities between IR specialists’ techniques for suturing in catheters.
  - Common methods of suturing derma were used at the base of the catheter.
  - Mattress suture (vertical)
  - Subcuticular suture
  - Purse-string suture
  - All catheters were wrapped and secured in place with multiple surgeon’s knots.
  - Possible nomenclature created.

**Recommendations**

- A larger inventory of catheters in patients would help to create a wider variety of resources and references.
- Refine the inventory by creating two separate categories of catheters due to their shape.
- Tunneled and non-tunneled catheters.
- Dialysis and pheresis catheters.
- Record multiple departments of IR specialists’ techniques, rather than one.
- Bias of IR specialists teaching other specialists in the department the skills they use.