

# Microbes Stay Out in VP Shunts!

## Using ChatGPT to Complement Nursing Expertise

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### BACKGROUND

- Ventriculoperitoneal (VP) shunt insertion and revision are **high infection risk surgeries**.
- VP shunt infections increase healthcare costs, produce negative patient outcomes, and increase patient's length of hospital stay.
- A surgeon-led VP shunt protocol was created to prevent infection
- **Objective: To reduce the rate of VP Shunt infections through standardization of protocol.**
- **PICO:** Can ChatGPT improve the current VP Shunt Infection Prevention Protocol created by surgeons?

### METHODS

- A continuous Quality Improvement Project using a PLAN-DO-STUDY-ACT (PDSA) cycle.
- Multi-phase project:
  - Phase 1 – Surgeon-led (creation of protocol)
  - Phase 2 – Nurse-led** (comparing current protocol with ChatGPT recommendations)
  - Phase 3 – Integration & standardization
- Usage of "Do Not Enter" signs to prevent extraneous personnel from entering room



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### VP Shunt Protocol

1. Equipment and materials required for the procedure identified and selected prior to the start of the case.
2. Traffic through the Operating Room will be restricted.
  - o No students, visitors, or vendors will be permitted during the procedure.
  - o No shift changes or reliefs for nurses or anesthesiology, apart from emergent circumstances or if the duration of procedure exceeds 90 minutes.
  - o If general surgery is present, their involvement is limited to the primary surgeon only, without accompaniment.
3. Participants in the sterile field must wash hands with a brush (prior to EVERY case) followed by Avaguard or formal sterile scrub.
4. ALL participants will double glove.
5. Prophylactic antibiotics: patient must be given Ancef 30mg/kg within 60 minutes of incision.
  - o If Ancef cannot be used due to allergy, the following are recommended alternatives:
    - Vancomycin 15mg/kg within 120 minutes of incision.
    - Clindamycin 10mg/kg within 60 minutes of incision.
6. Hair should be clipped, not shaved.
7. Skin prep with Chloraprep scrub from the neck down and must be the last step prior to draping.
8. Use loban for draping.
9. Gloves changed after draping and prior to handling the shunt.
10. The shunt must be completely submerged in antibiotic solution (Ancef 1G/1L saline) prior to implantation.
11. Use if antibiotic-impregnated shunts.
12. Wound must be irrigation with antibiotic solution (Vancomycin 1G/1L saline) prior to closure.



**VERSUS**



### ChatGPT-recommended VP Shunt Protocol

#### Preoperative Guidelines:

- **Screen for Active Infections:**
  - Ensure no signs of systemic or localized infection (e.g., skin, respiratory, or urinary infections).
  - Delay surgery if an infection is identified.
- **Antibiotic Prophylaxis:**
  - **First-generation cephalosporin** (e.g., cefazolin) within 30-60 minutes of incision.
  - If allergic to beta-lactams, use **vancomycin**.
  - For high-risk cases (e.g., MRSA colonization), use vancomycin in combination with cefazolin.
- **Hair Removal:**
  - **Clip hair** immediately before surgery, if required. Avoid razors.

#### Intraoperative Guidelines:

- **Antiseptic Preparation:**
  - Use **chlorhexidine-alcohol** solution for skin prep.
  - Use sterile drapes and cover the surgical site completely.
- **Sterile Technique:**
  - Use **double gloving** and maintain a **no-touch technique** for handling the shunt system.
  - **Change outer gloves** before touching the shunt components.
- **Minimize Operating Room Traffic:**
  - Limit OR personnel entering and exiting.
  - Aim to keep surgical time as short as possible.
- **Antibiotic-impregnated Shunt Systems:**
  - Consider **antibiotic-impregnated shunts** (e.g., rifampin, clindamycin) for high-risk patients or previous shunt infections.

#### Postoperative Guidelines:

- **Postoperative Antibiotics:**
  - Typically, antibiotics are **discontinued after 24 hours** unless there are complications.
- **Wound Care:**
  - Keep the surgical site clean and dry.
  - **Monitor for signs of infection** (e.g., redness, swelling, fever, discharge).
  - **Educate caregivers** on proper wound care and signs of infection.
- **Postoperative Monitoring:**
  - **Close surveillance** for shunt malfunction or infection.
  - **CSF cultures** may be considered in high-risk patients (e.g., neonates, previous infections).

### RESULTS

Table 1: 2024 Surgeons' record of compliance

	Used	Not Used
VP Protocol	63%	33%

- ChatGPT includes a post-op aspect of wound care and education.

### DISCUSSION

- There is an opportunity to eliminate infection rates with inclusion of post-op care and education.
- Despite the VP protocol, results depend on overall compliance to protocol requirements.
- Barriers identified to implementation and non-compliance of protocol: **new nursing staff, multi-service education, and surgeon preferences.**
- ChatGPT is not a replacement for nursing expertise in searching for evidence-based practices; but could be an excellent tool to ensure "microbes stay out!" in VP Shunt surgeries.
- As patient advocates, nurses need to ensure strict protocol compliance. Until then, data regarding whether the protocol is effective in preventing infection will be difficult to obtain.
- **Goal: PDSA Phase 2 & 3**
- **Conduct research: correlate VP shunt protocol and VP Shunt infection rate.**

### REFERENCES

