Hemostasis Methods Used In Cardiac Patients Post Percutanous Coronary Intervention

Brittany Curry, RN, BSN, PCCN

NURO 540 Department of Nursing, Georgetown University School of Nursing & Health Studies, Washington, D.C.

GEORGETOWN UNIVERSITY
School of Nursing & Health Studies
Department of Nursing

Purpose

- To identify which hemostasis method is preferred for use during percutaneous coronary intervention to reduce risks for vascular complications
- To identify if arterial closure devices are superior to manual compression in reducing complications

PICOT Question

In cardiac patients post femoral sheath removal, how does manual compression compared to an assisted closure device affect the risk for vascular complications over a 24-hour period?

Summary of Problem

- Complications such as hematoma, bleeding, infection, hypotension, pseudoaneurysm, lead to patient injury
- Manual compression requires intense physical exertion for 15-20 minutes
- Increased hospital length of stay and costs, morbidity and mortality (Merriweather & Sulzbach-Hoke, 2012)
- 25% of total costs were associated with PCI complications (Jacobson, Long, McMurtry, Naessens, & Rihal, 2007)

Search Strategy

Databases: CINAHL and PubMed
Search Terms: vascular closure devices, manual compression, femoral artery, sheath removal and arterial closure device
Inclusion Criteria: Published in English, within the last 10 years, human subjects, clinical trials, systematic reviews, full text
Exclusion Criteria: Not published in English, younger than 18 years old, animals
Results: 10 results yielding 6 RCTs, 1 Meta-Analysis, 1 Comparative (Cohort) Study, 1 Descriptive Correlational Study, 1 Retrospective (Case Control) Review

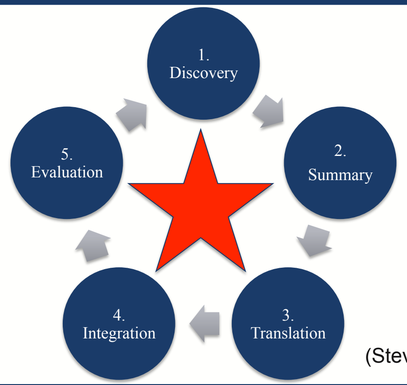
Table of Evidence

Citation	Summary	Melnyk & Fineout-Overholt's Hierarchy of Evidence
Allen et al. (2011)	Comparison (Cohort) Study. ACDs after PCI had lower incidence of major bleeding compared to MC	Level III
Behan et al. (2007)	RCT. AS has shorter time to mobilization, less bruising, and no increased risk for vascular complications	Level II
Dueling et all. (2008)	RCT. ACDs are superior to MC in terms of patient comfort, ambulation, and risk for vascular complication	Level II
Goswami et al. (2015)	RCT. BW in adjunct with MC has lower rates of complications and can significantly reduce TTH and TTA	Level II
Hamner et al. (2006)	Descriptive Correlational Study. Previous use of ACD is strongest predictor of vascular complications	Level V
Holm et al. (2014)	RCT. FS ACD is associated with significantly fewer hematomas compared to MC	Level II
Martin et al. (2008)	RCT. AS is associated with shorter TTA and TTH compared to MC. Major vascular complications were NS among the methods.	Level II
Schulz-Schupke et al. (2014)	RCT. ACDs are non-inferior to MC in terms of vascular access-site complications	Level II
Smilowitz et al. (2012)	Retrospective Review (Case Control Study). No consensus that ACDs safety is superior to MC	Level V
Jiang et al. (2015)	Meta-Analysis. Newer ACDs show improvement in device design, safety and show significantly decreased rates of vascular adverse events	Level I

Legend: ACD-Arterial Closure Device, AS-Angioseal, BW-Boomerang Wire, FS-Femoseal, MC-Manual Compression, NS-NonSignificant, PCI-Percutaneous Coronary Intervention, RCT-Randomized Control Trial, TTA-Time to Ambulation, TTH-Time to Hemostasis

Melnyk & Fineout-Overholt's Hierarchy of Evidence
Level I: Systematic Reviews & Meta-Analysis
Level II: RCTs
Level III: Controlled Cohort Studies
Level IV: Uncontrolled Cohort Studies
Level V: Case Studies and Case Series, Qualitative & Descriptive Studies, EBP Implementation & QI Projects
Level VI: Expert Opinion

EBP Model - ACE Star



(Stevens, 2012)

Lewin's Change Theory

Unfreeze
- **Ready for change**
  - Meet with stakeholders and facilitators to establish means for change by reviewing current percutaneous coronary intervention protocols
  - Identify percentage of complications associated with manual compression

Change
- **Execute change**
  - Luncheon with vascular device representatives
  - Physicians choose device
  - Hospital provides continuing education, certifications and training
  - Screen patients and provide information
  - 6 month pilot study

Refreeze
- **Making change permanent**
  - Evaluate and follow-up based on "green" checklist completed by nursing staff
  - Continue certifications by surgeons who perform femoral access procedures

(Morrison, 2015)

Recommendation for Practice Change

- Consistent findings from quality evidence were associated with reduced risks and vascular complications with the use of arterial closure devices versus manual compression
- Evidence supports "strong" recommendation for change (Guyatt et al., 2008)
- Utilize vascular devices during all diagnostic and elective percutaneous coronary intervention (PCI)

Components of Change

Stakeholders
- Cardiac patients undergoing PCI, RNs, NPs, Cardiovascular Surgeons, Interventional Cardiologists, Vascular Surgeons

Facilitators
- Physician Champion (educated and experienced in the devices)
- Nurse Champion (who works along with physician to implement the change)
- Cardiac Units Nurse Managers and Charge RNs
- Nurse Educator
- Cardiology Nurse Practitioners

Barriers
- Physicians preference and experience using devices
- Nursing staff perspectives
- Contraindications to using the vascular device
- Hospital cost

EBP Evaluation

Formative
- Track each patient's recovery and/or complications using a designated "green" checklist weekly

Summative
- # of days in hospital
- # of complications over a 6 month period determined at follow up appointment with Cardiologist
- # of patients with vascular device satisfied with their recovery based on Care Card scores
  - Rated 1-5 (1 unsatisfied, 5 satisfied)

Practice Implications

- Decrease post PCI complications
- Decrease hospital length of stay
- Decrease hospital cost
- Decrease staffing for nurses
- Decrease time to ambulation

References

Refer to handout

Poster produced by Faculty & Curriculum Support (FACS), Georgetown University School of Medicine

Post Percutaneous Coronary Intervention Checklist

January 2016 - June 2016

Hemostasis Method:	Anticoagulation:
Time to Hemostasis:	Time to Ambulation:

	6 hours	12 hours	24 hours	30 hours	36 hours	If yes, please make comment.
Bleeding, oozing at site						
Retroperitoneal Hematoma						
Pseudoaneurysm						
Infection						
Time of Discharge						