

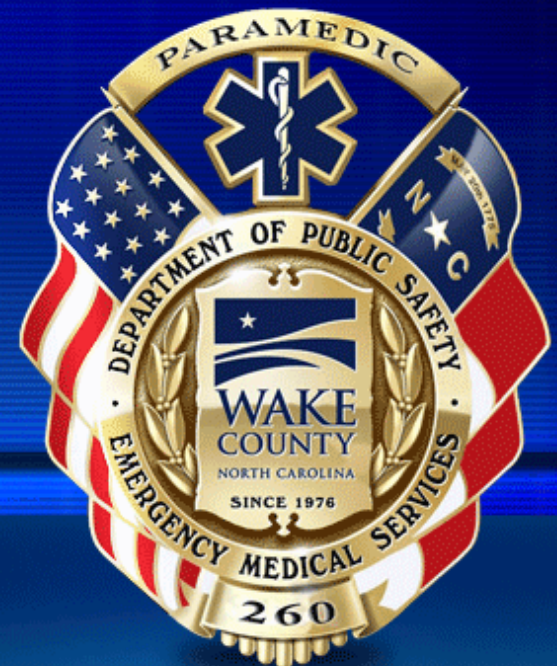
Tourniquets and Goody Powders

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**Life is really simple
But we insist
On making it
Complicated.**

-Confucius









Causes of Renal Failure in North Carolina

✚ Untreated hypertension

✚ Uncontrolled diabetes

✚ Goody Powders

✚ SOURCE: My favorite nephrologist



Wake County Experience

- ✚ Placed tourniquets on all units in February 2005
- ✚ Have been used on 31 patients
 - ✚ One train amputation of a lower leg
 - ✚ Gunshots and stabbings
 - ✚ 10 patients with indwelling catheters/fistulae/shunts for dialysis (one patient had 2 applications in a week)



The Evidence

- ✚ Review of experience from the military experience in Iraq (165 patients)
- ✚ Evaluated the impact of tourniquets upon clinical status on arrival, blood products, and ultimate outcome
 - ✚ Beekley AC J of Trauma 2008;68:S28-37



Table 2 Bleeding Control, Tourniquet vs. No Tourniquet

	Tourniquet (%)	No Tourniquet (%)	<i>p</i> *
No bleeding on arrival	83.3	60.7	0.033
No bleeding on arrival (injuries requiring primary or debridement amputations)	92	50	0.058 (NS)
No bleeding on arrival (reconstructable vascular injuries)	69	60	0.456 (NS)
No bleeding on arrival (upper extremity injuries)	85	40	0.037
No bleeding on arrival (lower extremity injuries)	83	72	0.308 (NS)
No bleeding on arrival (ISS >15)	85	17	<0.0001

Outcomes

- ✚ No significant difference between groups regarding need for blood transfusion
- ✚ There was no difference in mortality between the two groups
- ✚ Limited due to observational nature



Recent Review

- ✚ The prehospital utilization of tourniquets is reviewed and encouraged
- ✚ Good reading for EMS providers, EM, and Trauma Surgery
 - ✚ Doyle G. PEC 2008;12:241-56



Myths?

- ✚ Ischemia will be a problem
- ✚ Reperfusion will be a problem
- ✚ Neurologic damage will be a problem



Routine EMS Tourniquet Use Algorithm

Significant Extremity Bleeding
with need for other interventions?

Yes:

No:

Apply tourniquet to
bleeding limb(s) on
proximal segment

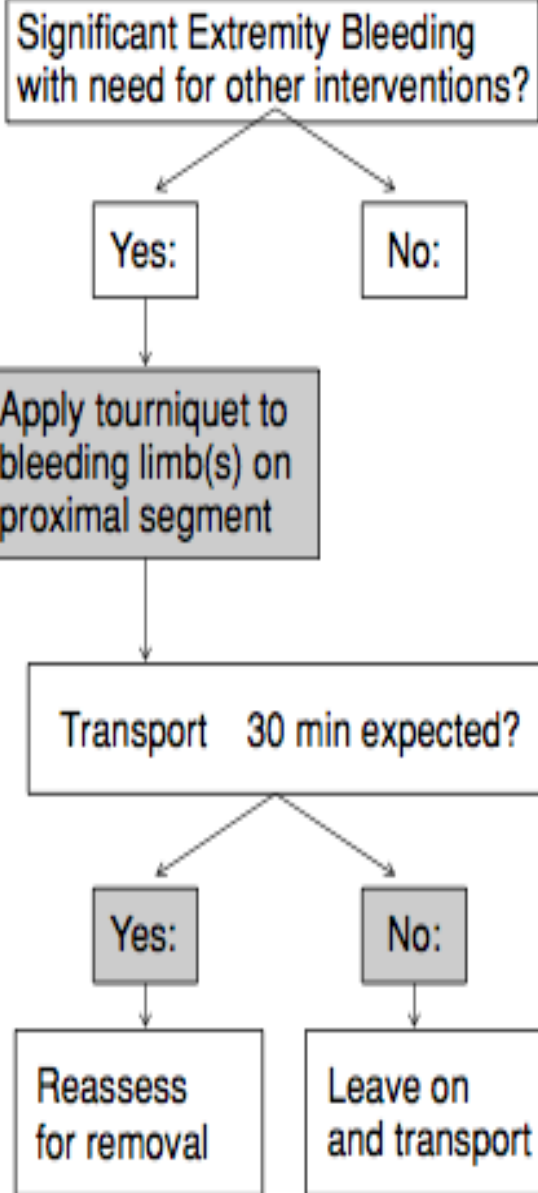
Transport 30 min expected?

Yes:

No:

Reassess
for removal

Leave on
and transport



The Ten Bleeding Shunts

- ✚ Mean lowest SBP = 117
- ✚ Mean highest pulse = 86
- ✚ Mean estimated blood loss = 970
- ✚ Mean number of “soaked” towels = 2.5
- ✚ Mean number of hyperbolic terms in the narrative = 2.5



Quotes from Charts

- ✦ “Gently placed the tourniquet”
- ✦ “Did not completely cut off blood flow but tightened only to control bleeding”
- ✦ “Tried to release the shunt and the bleeding started again”



Patient # 9 – Case Report

- ✚ 58 year old female with PMH significant for ESRD with HD
- ✚ Femoral AV fistula was in place
- ✚ ~30 minutes prior to calling EMS, bleed from fistula began
- ✚ Blood was “on the gown, on the kitchen floor, in the bed room”



Patient #9 Case Report

- ✚ Blood was “squirting 2 feet in the air” from the right upper thigh
- ✚ Initial assessment:
 - ✚ Respirations – agonal at 4 breaths/min
 - ✚ Pulse = 48 and weak at carotid
- ✚ Two minutes and 15 seconds after arrival, the tourniquet was in place



Patient #9 Case Report

- ✚ Scene time <10 minutes
- ✚ After tourniquet placement:
 - ✚ Pulse increased from 48 to 84
 - ✚ Blood pressure increased to 78/58
 - ✚ Respirations increased from 4 to 18
 - ✚ SaO2 = 88%
- ✚ Patient alert and interactive after 8 minute transport to ED



Summary

- ✚ Tourniquet use is inexpensive
- ✚ It can be lifesaving, and when it is not, it will help calm the EMS providers and the patient
- ✚ No demonstrable harm in the first 30 minutes



