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## Easy and accurate transition between common beta blockers: a QI project

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**Easy and accurate  
transition between  
common beta  
blockers: a QI project**

Sam Short

Mentor: Amalia Kane MD

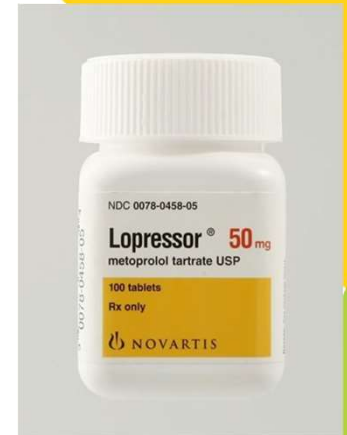
March 2022



The University of Vermont

# Hypertension Management is Difficult

- Beta blockers 1<sup>st</sup> line in angina, post MI, HF
  - 1<sup>st</sup> line HTN until 2003
  - Metoprolol is common prescription, both appropriately and less appropriately
- HTN common, often worsens with age/dz progression
- Many prescribed metoprolol have worsening HTN despite 1<sup>st</sup> line anti-HTN treatment
  - Pt preference for fewer # prescriptions is strong
  - Further control possible by swapping BB therapy
- BP: carvedilol > metoprolol
- Conversion NOT 1:1
  - Incorrect conversion → bradycardia, hypotension
  - Must be done safely!
- No readily accessible evidence-based tool at UVM
  - Clinic time constraints is a large barrier



# Cost

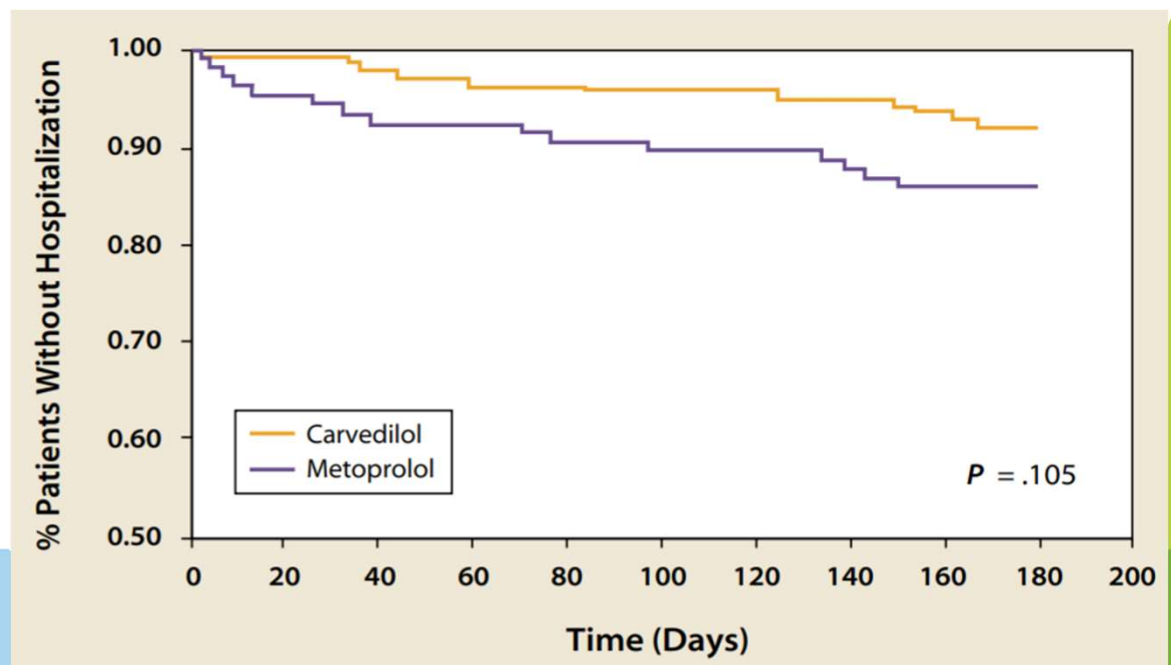
- HTN costs US \$200b annually (~\$3b in VT; 1)
- BB's reduce healthcare utilization in HF (~\$10k/pt/yr; 2, 3)

1: CDC POLARIS

2: Stewart *et al*, Int J Cardio, 2005

3: Gilbert, Heart Failure Care, 2002

MORE health costs and hospitalizations with metoprolol than carvedilol.  
Substantial trend in this trial is limited by power alone  
(i.e. protective effect would have significant P value in larger study)



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## Community Perspective

Dr. Tony Williams, UVM Colchester Family Medicine

*“This is an incredibly helpful project as I often perform these conversions. They are difficult as I do not have a good resource for this. I have many patients on either of these medications and often must go back and forth depending on degree of beta blockade as carvedilol is more potent. Having a quick, focused, and accurate tool such as this would be greatly beneficial to my practice from safety and time management perspectives.”*

Dr. Gary Gilmond, UVM Essex Adult Primary Care

*“In primary care hypertension is a highly prevalent problem often requiring multiple medications to adequate management. Beta blockers can be a useful tool in managing blood pressure, but it can be difficult to switch beta blocker medications given their widely ranging potency. Dose equivalent tables such as the one found in this dot phrase are incredibly useful for a primary care physician trying to transition a patient from one beta blocker formulation to another under typical office time constraints. These tables allow PCPs to be more thorough and efficient in the management of hypertension.”*

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## Intervention and Methods

- Lit review of equivalent dosages
  - Trials
  - Basic data
  - Expert opinion
- Creation of equivalency tool as EPIC dot-phrase
- Now: tool available for any provider wishing to safely switch to carvedilol
  - Several reasons to do this: shared decision making, multi-drug resistant HTN, insulin resistance, and others
- Future: assess efficacy and use patterns

## Results: .metop2carv dot phrase

Medication	Release	Dose			
Metoprolol (Lopressor)	Tartrate (immediate)	12.5 mg BID	25 mg BID	50 mg BID	100 mg BID
	Succinate (extended)	25 mg daily	50 mg daily	100 mg daily	200 mg daily
Carvedilol (Coreg)	Immediate (IR)	3.125 mg BID	6.25 mg BID	12.5 mg BID	25 mg BID
	Continuous (CR)	10 mg daily	20 mg daily	40 mg daily	80 mg daily

### [Source](#)

#### Special Considerations

- Conversion to carvedilol may lower BP by 5-10 mmHg (1)
- Carvedilol has weaker effects on HR than metoprolol (2)
- Of these four medications, all but metoprolol *tartrate* exhibit cardioprotective effects
- There is no known mortality benefit for carvedilol compared to metoprolol succinate (3)
- Compared to metoprolol, carvedilol may have lower risk for BB-induced insulin resistance (4)

1: DOIs: 10.1007/bf00207612; 10.1016/S1388-9842(01)00126-X

2: DOI: 10.1016/s1388-9842(01)00126-x

3: DOI: 10.1161/CIRCHEARTFAILURE.114.001701

4: DOI: 10.1136%2Fhrt.2006.092379

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## Effectiveness

- Focused intervention to solve common issue
- Readily accessible at point of care
- Ease of interpretation (ie not cluttered with many medications)
- Use has high potential to **align with patient preference for fewer medications**

## Limitations

- Tool is not comprehensive, there are many beta blockers
  - Direction for further research
- Other non-BB meds are often desirable to treat HTN
  - Tools meant to augment this, not replace 1<sup>st</sup> line therapies
- We need to increase provider awareness of this tool



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## Future Directions

- Create other dose-equivalency tables for common medications
- Build a “beta blocker conversion calculator”
  - Choose med input and dose, choose med output and receive dose
- EPIC based tools for HTN management
  - Calculator, as above
  - Automatic notifications for patients on selective BB therapy who might benefit from non-selective therapy

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# Interview Consent

Thank you for agreeing to be interviewed. This project is a requirement for the Family Medicine clerkship. It will be stored on the Dana Library ScholarWorks website. Your name will be attached to your interview and you may be cited directly or indirectly in subsequent unpublished or published work. The interviewer affirms that he/she has explained the nature and purpose of this project. The interviewee affirms that he/she has consented to this interview.

Consented   X  

Name: \_\_\_\_\_ Tony Williams

Name: \_\_\_\_\_ Gary Gilmond

Did NOT Consent \_\_\_\_\_

Name: \_\_\_\_\_

Name: \_\_\_\_\_