JLARC
JOINT LEGISLATIVE AUDIT
AND REVIEW COMMISSION

December 6, 2021

# Health Insurance Mandate Review: Prosthetics HB2669 (2019 session)

Health Insurance Reform
Commission Briefing

# Questions for JLARC Stage 2 Review

- Is there evidence that the proposed treatment is effective?
- How commonly used and available is the proposed treatment?
- What is the cost of the treatment for individuals without insurance coverage?

# In Brief

HB 2669 would change the existing *mandate to offer* coverage of prosthetics to a *mandated benefit*.

HB 2669 may also expand coverage of electric prosthetics to more amputees in Virginia.

Electric prosthetics can provide greater control and balance for amputees, but a relatively small number of amputees in Virginia use electric devices.

Electric prosthetics typically cost substantially more than body-powered devices.

# In this presentation

Background

Medical efficacy and use of prosthetic limbs

Financial impact on individuals without coverage

Coverage provided by HB2669

# Nearly 2 million people nationwide have lost a limb

- Estimates suggest approximately 1.9 million people in the U.S. live with limb loss
  - Number of people with limb loss is projected to reach 3.6 million by 2050
- Estimated 43,000 people in Virginia live with limb loss

Source: Ziegler-Graham, K., et al. Estimating the Prevalence of Limb Loss in the United States: 2005 to 2050. Archive of Physical Medicine and Rehabilitation, 2008.

# Most amputations are to lower limbs and caused by vascular disease

- Research suggests the vast majority of amputations are to the lower extremities
- Approximately 70% of amputations are caused by vascular disease (e.g., diabetes, peripheral arterial disease)
  - Most common cause of lower limb amputations
- Nearly 30% of amputations result from trauma
  - Most common cause of upper limb amputations

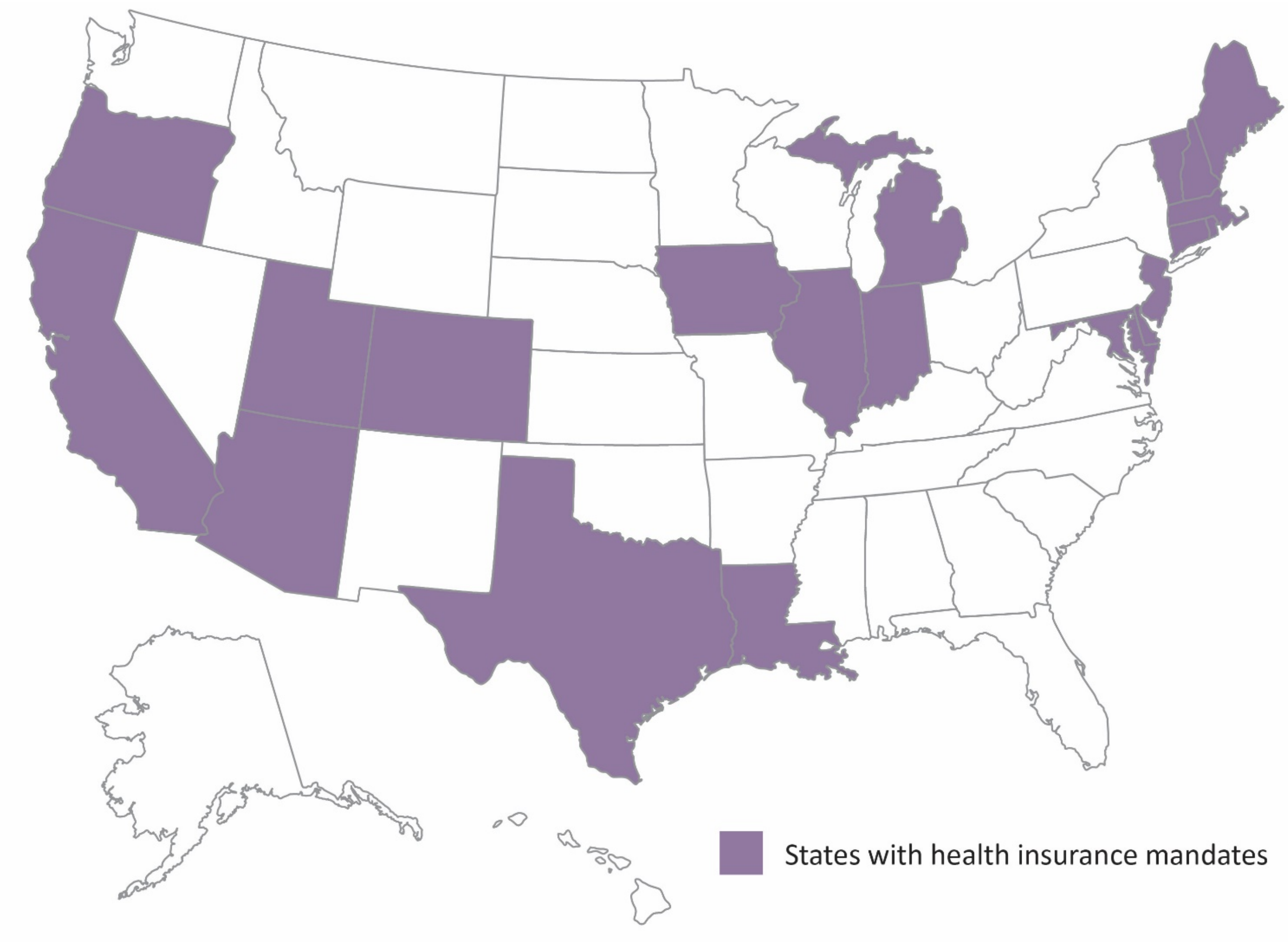
# Prosthetic limbs may be body-powered or electric

- Body-powered prosthetics controlled by the amputee, often through a system of cables and pulleys
- Electric prosthetics are controlled partly by electric sensors in the device
  - Myoelectric: upper limb prosthetic controlled by sensors that receive electrical signals from amputee's muscles
  - Microprocessor: lower limb prosthetic with sensors that control the knee based on the terrain and the amputee's foot movement and gait speed
- Broad range of body-powered and electric prosthetics are available for amputees

# HB2669 requires coverage of prosthetic limbs, including electric devices

- Requires insurance plans to cover medically necessary prosthetic devices
  - Includes coverage of device repair, fitting, replacement, and components
- Requires coverage of any myoelectric or microprocessor prosthetics covered by Medicare

# At least 20 other states require some coverage of prosthetics



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# Prosthetics are critical to amputees regaining functionality and independence

- Limb loss can result in significant functional limitations
  - Secondary conditions resulting from limb loss include mental health concerns, sedentary lifestyle, and dependence on caretakers
- Many amputees with prosthetics are able to regain some functionality and return to work
  - Many also show a reduction in secondary conditions caused by limb loss
- Not all amputees will need a prosthetic
  - For example, amputees with low functional level (e.g., little ability to move before amputation) may not benefit from prosthetic legs

# Electric prosthetics can provide greater balance and control for amputees

- Strong evidence shows microprocessor knees reduce falls
  - Greater satisfaction, improved balance with microprocessor knees
- Smaller number of studies find improved control and satisfaction for amputees with myoelectric upper limbs
  - More research needed to confirm efficacy of myoelectric devices
- Medical experts said electric prosthetics are an effective treatment for certain amputees
- Most helpful when amputation is above joint (knee or elbow)

# Type of prosthetic needed depends on the amputees' circumstances

- Need for a prosthetic is determined by physician
- Amputees with higher functionality generally need more complex prosthetics
  - For example, amputee that uses fine motor skills for work may need a myoelectric arm and hand
- Amputees with cognitive limitations or outdoor jobs may be better suited for body-powered prosthetics
  - Electric devices generally require more training, which may be more difficult for amputees with cognitive limitations (e.g., brain injuries)
  - Body-powered devices are more durable and less likely to be affected by moisture and dirt outside

# Small number of amputees in Virginia receive electric prosthetics

- Less than 2% of prosthetic-related charges through UVA health system or state employee insurance plan were for electric prosthetics (FY21)
- Medical experts also indicate only a small percentage of amputees receive electric prosthetics
- Small number of electric prosthetics partly reflects the most common types of amputations
  - Above-knee amputations are less common than below-knee
  - Relatively few upper limb amputations (which can use electric prosthetics) are above the elbow

# Electric prosthetics are more commonly provided through the Veterans Administration

- Microprocessor and myoelectric prosthetics are more commonly prescribed through the VA, according to medical experts
- VA clinical guidelines recommend microprocessor knees reduce falls and maximize patient satisfaction

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# Electric prosthetics cost substantially more than body-powered prosthetics

| Type of device | Body-powered cost* | Electric cost* |
|---|---|---|
| Upper limb prosthetic | $3,000 – $20,000 | $10,000 – $45,000 |
| Lower limb prosthetic | $1,000 – $4,000 | $15,000 – $50,000 |

- For example, microprocessor legs through the state employee insurance plan cost up to $24,500
- Broad range of devices accounts for cost differential
- Additional costs include components and fittings
  - Cost of sockets and inserts can vary widely

* Cost figures based on estimates from medical experts

# Electric prosthetics need more frequent repair and replacement than body-powered devices

- Microprocessor legs may need replacement every 3–5 years
  - Electric prosthetics more complex and prone to wear-and-tear
- Body-powered prosthetics are more durable and generally have longer lifespan
- Sockets (where prosthetics attach to limbs) need replacement for body-powered and electric prosthetics
  - Sockets may need replacement when amputees change size and shape

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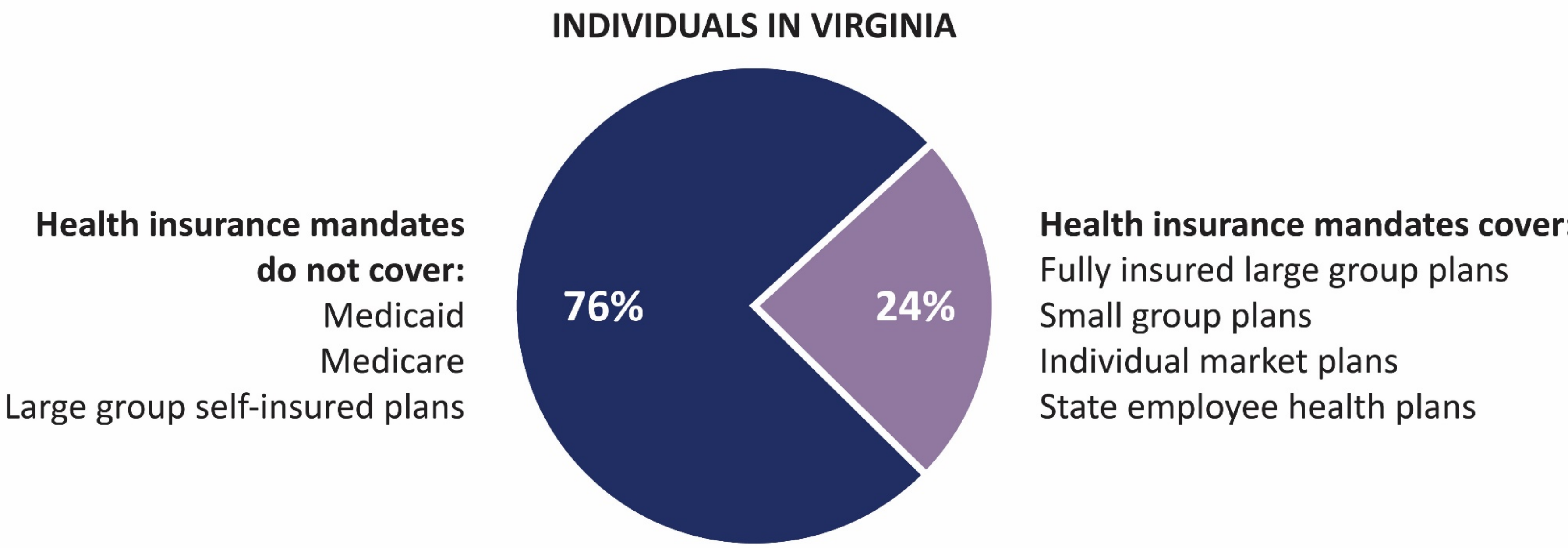
# Insurance plans are already required to provide some coverage of prosthetics

- Plans are required by the Code of Virginia to *offer* a policy covering prosthetics
- Individual and small-group plans cover prosthetics as part of the essential health benefit
- Plans provide varying levels of coverage for prosthetics and their repair and replacement
  - Prosthetic devices are considered on a case-by-case basis
  - Some electric devices are covered, but others are considered experimental

Code of Virginia §38.2-3418.15

# HB2669 would apply to insurance plans covering approximately one-quarter of Virginians




Note: §38.2-6506 A 1 prohibits qualified health plans (including those sold on the exchange) from providing state mandated benefits that are in addition to the essential health benefit (EHB). Any state mandate enacted after 2011 is considered in addition to the EHB.

# HB2669 would expand coverage of prosthetic devices

- HB2669 would change the existing provision that insurance plans offer coverage of prosthetics to a mandated benefit requiring coverage
- HB2669 would expand the types of prosthetics required to be covered to include electric devices
  - Microprocessor prosthetic legs
  - Myoelectric prosthetic arms

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# Appendix: Literature reviewed


Carey, S.L., et al. Differences in myoelectric and body-powered upper-limb prostheses: Systematic literature review. Journal of Rehabilitation Research and Development, 2015; 52(3): 247-262.

Chen, C., et al. Economic benefits of microprocessor controlled prosthetic knees: a modeling study. Journal of NeuroEngineering and Rehabilitation, 2018; 15(Suppl 1): 62.

Highsmith, M.J., et al. The effect of the c-leg knee prosthesis on sensory dependency and falls during sensory organization testing. Technology Innovation, 2014; 2013(4): 343-347.

Kannenberg, A., et al. Benefits of microprocessor-controlled prosthetic knees to limited community ambulators: Systematic review. Journal of Rehabilitation Research and Development, 2014; 51(10): 1469–96.

Lansade, C., et al. Mobility and satisfaction with a microprocessor-controlled knee in moderately active amputees: A multi-centric randomized crossover trial. Annals of Physical and Rehabilitation Medicine, 2018; 61: 278–285.

Lansade, C., et al. Impact of C-LEG on mobility, satisfaction and quality of life in a multicenter cohort of femoral amputees. Annals of Physical and Rehabilitation Medicine, 2021; 64: 101386.

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Moller, S., et al. Perceived self-efficacy and specific self-reported outcomes in persons with lower-limb amputation using a non-microprocessor-controlled versus a microprocessor-controlled prosthetic knee. Disability and Rehabilitation: Assistive Technology, 2018; 13(3): 220-225.

# Appendix: Literature reviewed, cont'd.

Ramstrand, N., et al. Transitioning to a microprocessor-controlled prosthetic knee: Executive functioning during single and dual-task gait. Prosthetics and Orthotics International, 2020; 44(1): 27-35.

Resnik, L., et al. Evaluation of EMG pattern recognition for upper limb prosthesis control: a case study in comparison with direct myoelectric control. Journal of NeuroEngineering and Rehabilitation, 2018; 15(23): 15-23.

Sawers, A.B. and Hafner, B.J. Outcomes associated with the use of microprocessor-controlled prosthetic knees among individuals with unilateral transfemoral limb loss: A systematic review. Journal of Rehabilitation Research and Development, 2013; 50(3): 273-314.

Sen, I.S., et al. Effects of microprocessor-controlled prosthetic knees on self-reported mobility, quality of life, and psychological states in patients with transfemoral amputations. Acta Orthopaedica et Traumatologica Turcica, 2020; 54(5): 502-506.

Squella, S.A.F., et al. Enhancement of a prosthetic knee with a microprocessor-controlled gait phase switch reduces falls and improves balance confidence and gait speed in community ambulators with unilateral transfemoral amputation. Prosthetics and Orthotics International, 2018; 42(2): 228-235.

Van Der Riet, D., et al. An Overview and Comparison of Upper Limb Prosthetics. 2013 Africon, 2013; 1-8.

Webster, J.B., et al. Clinical Practice Guidelines for the Rehabilitation of Lower Limb Amputation: An Update from the Department of Veterans Affairs and Department of Defense. American Journal Physical Medicine and Rehabilitation, 2019; 98(9): 820–829.

Ziegler-Graham, K., et al. Estimating the Prevalence of Limb Loss in the United States: 2005 to 2050. Archive of Physical Medicine and Rehabilitation, 2008; 89: 422-429.

# Appendix: Medical experts interviewed

- VCU Health
- UVA Medical Center
- U.S. Department of Veterans Affairs