VERSION 3.0 | EVIDENCE-BASED CLINICAL PLAYBOOK

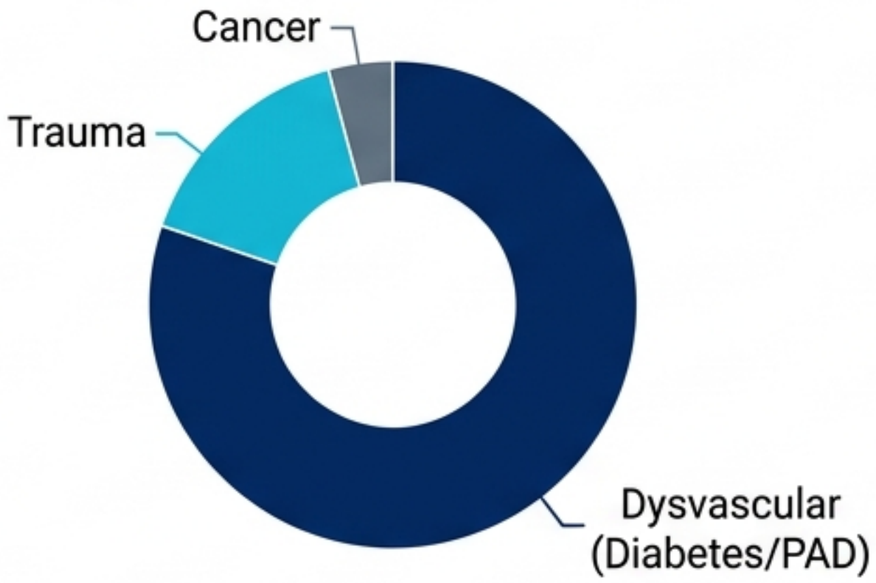
# Translating the 2024 VA/DOD Lower Limb Amputation Clinical Practice Guideline

An interactive, visual blueprint for the interdisciplinary rehabilitation and lifelong management of individuals with lower limb loss.

# The National Landscape

## 2.2 Million

Estimated individuals living with limb loss in the U.S. (2016-2021).




# The VA/DOD Context

## The Dysvascular Veteran (VA)

- **75,000+** Veterans with LLA in FY23
- **88.6%** driven by diabetes
- High incidence of co-morbidities
- Systemic cardiovascular & renal risk

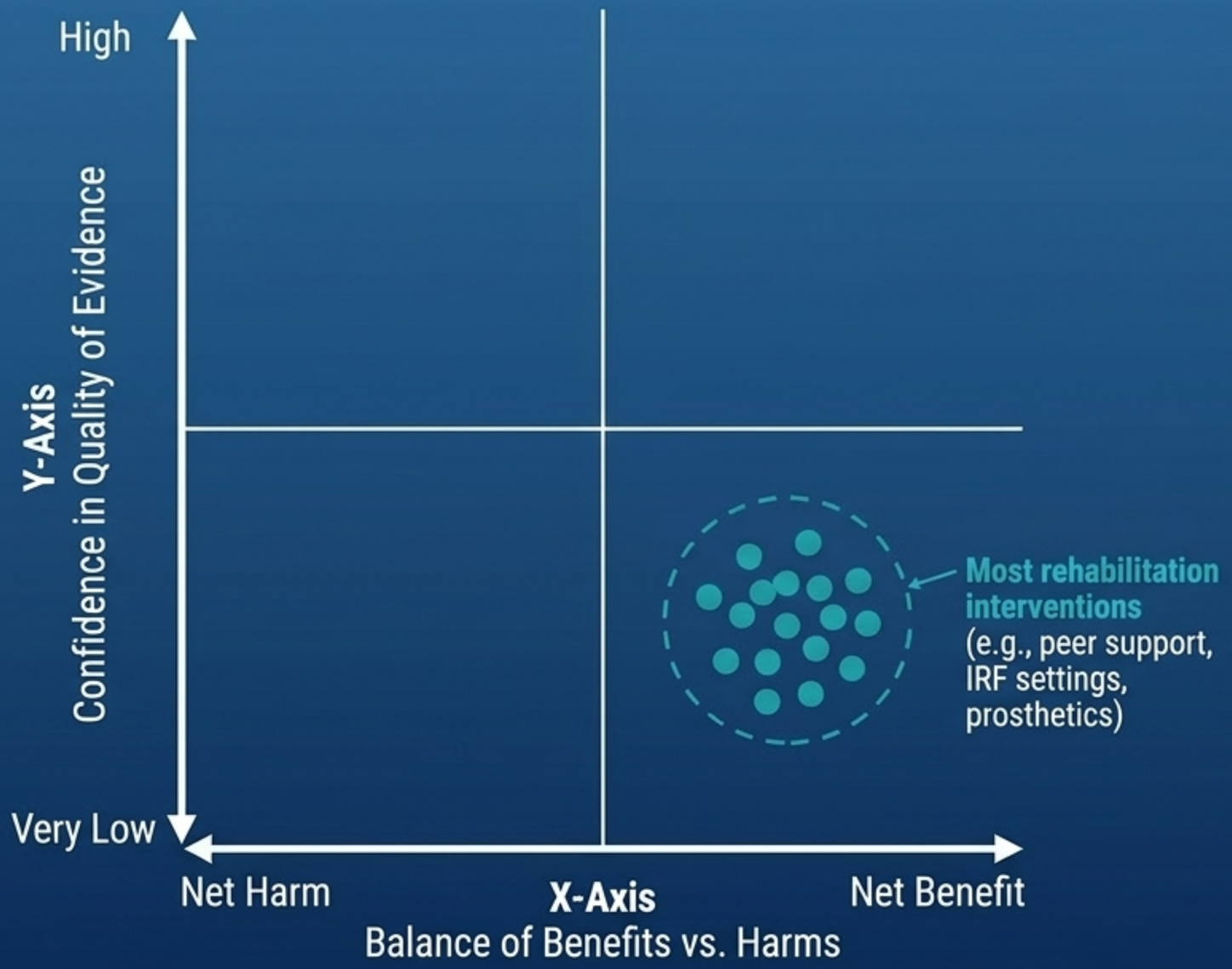
## The Traumatic Service Member (DOD)

- **1,446** patients with lower limb loss
- Driven by blast/crush injuries
- Younger demographic profile
- High incidence of PTSD & HO

# The Amputation Care Team (ACT)


**Key Insight: A multidisciplinary team reduces barriers to interdisciplinary communication, improving diagnostic efficiency and enabling a whole-person approach to lifelong management**

# The GRADE Evidence Methodology




# The Playbook Badges

## WEAK FOR

We suggest the intervention. The clinical benefit outweighs the harm, despite low confidence in double-blind RCT evidence.

## INSUFFICIENT

Neither for nor against. Current evidence is too scarce or conflicting to make a definitive clinical recommendation.

**Note:** In rehabilitation research, double-blind RCTs are often impossible, resulting in "low quality" ratings for highly beneficial, low-risk interventions.

# The Care Pathway Blueprint

The 26 clinical recommendations mapped along the patient continuum.
Follow the pathway to specific clinical playbook scorecards.

PHASE 1:
PRE-AMPUTATION

# Establishing the Baseline

## Recommendation 9

Weak For

**Suggest cognitive assessment to inform rehab goals and prosthetic candidacy.**

**The Why:**

Impaired executive function and memory memory directly predict lower rates of successful prosthetic fitting, decreased mobility, and increased falls.

Psychologist

## Recommendation 14

Weak For

**Suggest screening for factors associated with rehabilitation outcomes (smoking, comorbidities, physical function).**

**The Why:**

ESRD, COPD, and poor pre-morbid physical fitness are the strongest predictors of negative post-op mobility and mortality.

Primary Care

PHASE 1:
PRE-AMPUTATION

# The Surgical Event

## Recommendation 1

**Insufficient evidence to recommend one specific surgical procedure over another.**

Procedure is driven by surgeon experience, patient anatomy, and etiology.

## Recommendation 2

**Suggest osseointegration for eligible transfemoral patients to improve prosthesis use.**

Potential risks (infection, fracture) must be carefully weighed against high functional benefits.

## Recommendation 3

**Insufficient evidence for or against Targeted Muscle Reinnervation (TMR) specifically for phantom limb pain.**

Emerging promise exists, but evidence lacks sufficient comparative strength.

# The Pain Management Protocol Matrix

| | Pharmacological | Non-Pharmacological | Surgical / Device |
|---|---|---|---|
| **Perioperative Pain** | **Rec 4**: Intraoperative Perineural Catheter (PNC) for local anesthetic to reduce post-op pain. | | |
| **Phantom Limb Pain (PLP)** | **Rec 23:** Systemic pharmacologics (ketamine, gabapentin, opioids) lack sufficient evidence. | **Rec 11:** Mirror Therapy improves pain, function, and quality of life. | **Rec 22:** PNC delivered anesthetic for chronic severe PLP with functional impairment. |
| **Residual Limb Pain (RLP)** | | | **Rec 21:** Neurostimulation/ablation interventions lack sufficient evidence. |

PHASE 2:
POST-AMPUTATION

# Acute Setting & Limb Protection

## (The Setting)

### Recommendation 6

**Suggest providing post-operative care in an Inpatient Rehabilitation Facility (IRF) over a SNF or home care.**


IRF patients achieve higher mobility success due to interdisciplinary therapy intensity.

## (The Dressing)

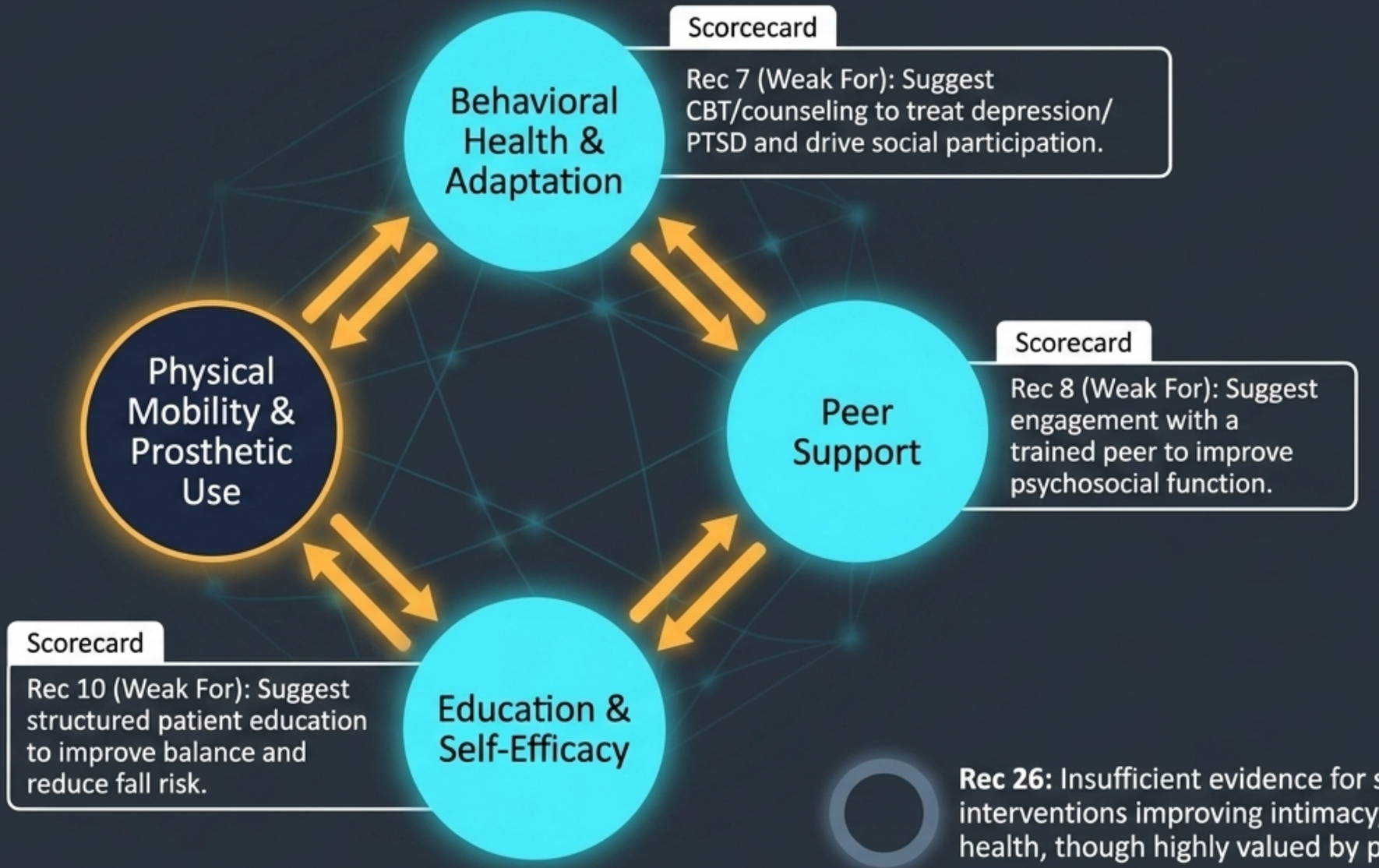
### Recommendation 5

**Suggest application of rigid or semi-rigid residual limb dressing for post-transtibial amputations.**

- Maximizes volume reduction
- Protects incision during falls
- Prevents knee flexion contractures

# The Cognitive & Psychosocial Web

## How behavioral health directly drives physical mobility.




**Rec 26:** Insufficient evidence for specific interventions improving intimacy/sexual health, though highly valued by patients.

PHASE 3:
POST-AMPUTATION
REHABILITATION

# Foundational Rules of Restoring Movement

Recommendation 12

## The Individualized Protocol

Suggest an individualized, skilled rehab program with targeted exercise and gait training.

Intensity and dosage matter. Must be strictly tied to patient-specific goals.

Recommendation 13

## Identity & Sex

Suggest using patient-identified sex to inform individualized rehabilitation plans.

Sex directly impacts community reintegration, body image, and the suitability of componentry size/weight.

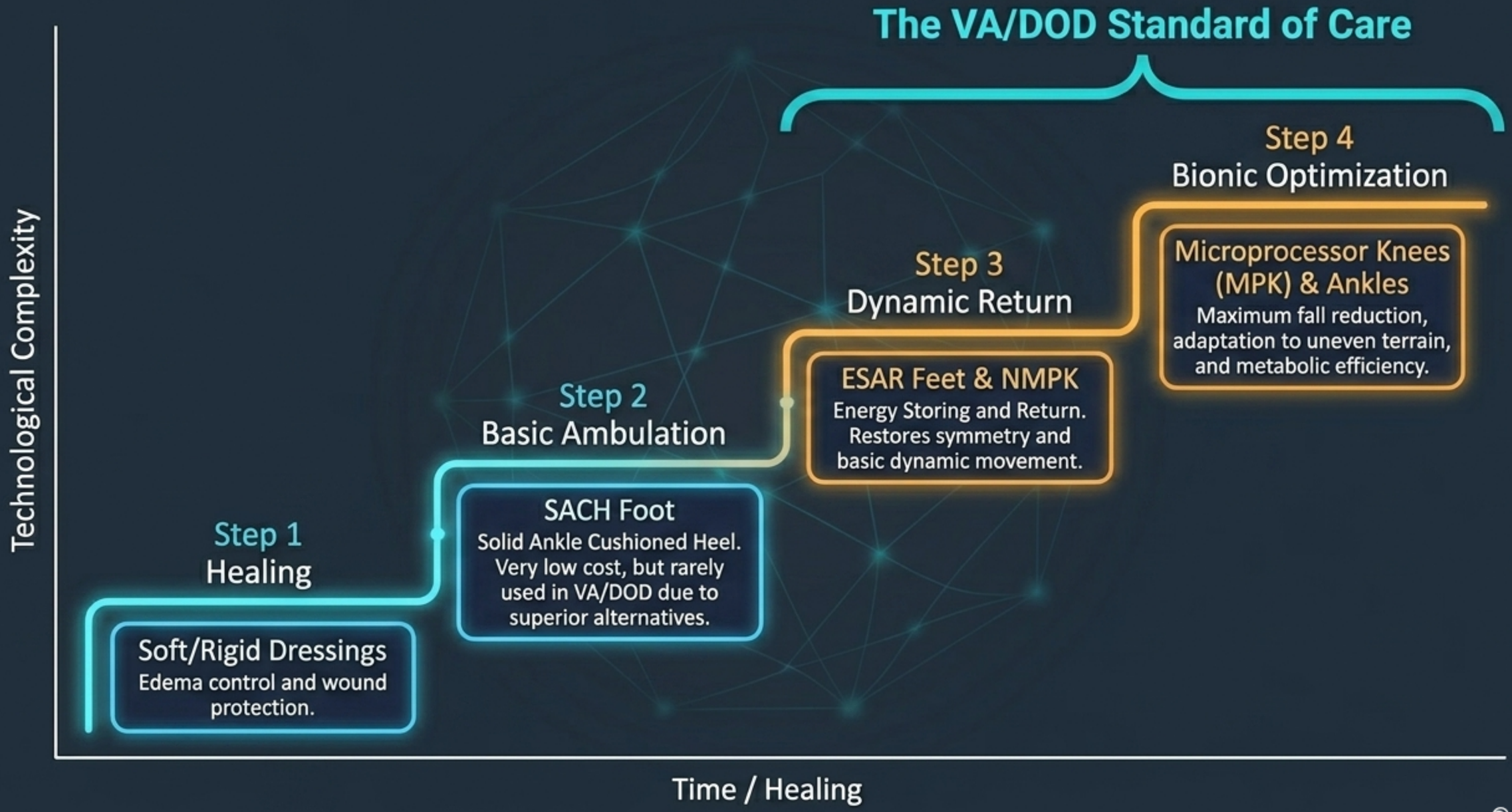
Recommendation 20

## Dual Measurement

Suggest using validated patient-reported AND performance-based measures.

Dual tracking is required to justify advanced components and objectively validate Quality of Life.

# The Prosthetic Ambulation Spectrum



# The Prosthetic Technology Matrix

Synthesizing evidence for component prescription.

## KNEE

**Recommendation 17**

Prescribe Microprocessor Knees (MPK) over Non-Microprocessor Knees (NMPK).

Drastically reduces falls and optimizes intermediate/high functional mobility. Highest impact on patient safety.

## FOOT & ANKLE

**Recommendation 19**

Prescribe ESAR or Microprocessor feet over SACH feet.

Provides superior ambulation, symmetry, and user satisfaction.

**Recommendation 18**

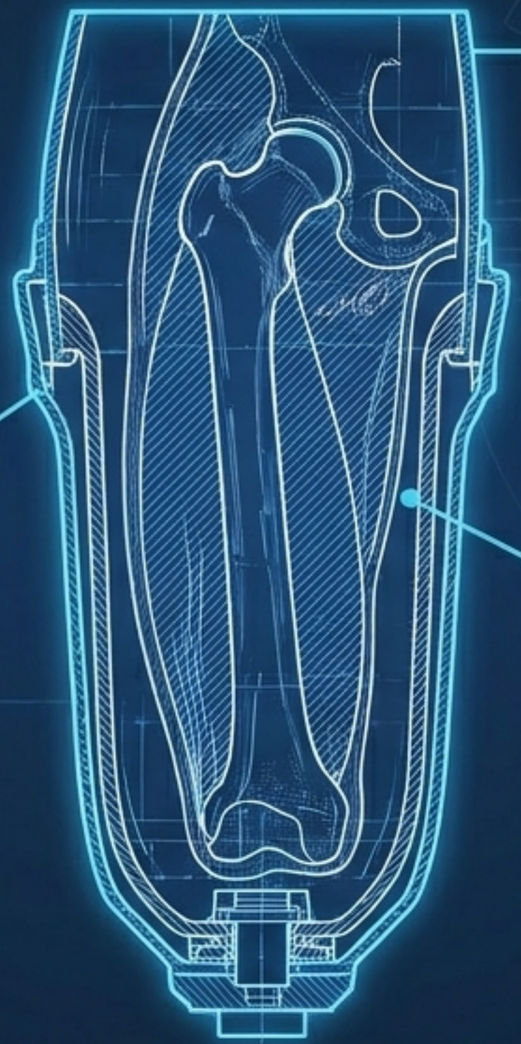
Insufficient evidence to prescribe one specific ESAR or Microprocessor foot over another.

Clinicians should trial a variety of modern feet to optimize patient-centered outcomes.

PHASE 3:
POST-AMPUTATION
REHABILITATION

# The Socket Interface

The critical point of connection between human and machine.



## Recommendation 15

Insufficient evidence to recommend any specific transfemoral socket design for community ambulators.

Success relies heavily on prosthetist skill and individual patient fit.

## Recommendation 16

Insufficient evidence to recommend Ischial Containment over Sub-ischial designs.

Clinicians should trial different designs based on clinical judgment and patient preference.

## Recommendation 24

Insufficient evidence for Botulinum toxin (Botox) to reduce sweat.

Despite encouraging small-scale RCTs, more evidence is needed to recommend for hyperhidrosis management.

PHASE 4: **PRIMARY CARE**

# Lifelong Management & Preservation

## Monitoring the Continuum

- Monitor for socket fit and limb volume changes.
- Assess ongoing psychosocial adjustment.
- Maintain an open referral loop back to the Amputation Care Team (ACT).

**Recommendation 25**

Insufficient evidence for specific surgical strategies to prevent re-amputation or contralateral amputation.

Due to the systemic nature of dysvascular disease, patients are at extreme risk for contralateral limb loss. Aggressive primary care foot screening, glycemic control, and smoking cessation are paramount.

# The Whole-Health Amputation Paradigm


Insight: Technological optimization (prosthetics) is fundamentally bottlenecked by psychological adaptation and systemic continuity. Evidence-based care mandates simultaneous intervention in all three spheres.

# Research Priorities & The Horizon

Where clinical practice outpaces published evidence.

**Evidence guides us; clinical expertise and patient values take us the rest of the way.**

## The Dysvascular Gap

Targeting peripheral nerve surgeries (TMR) and osseointegration specifically in dysvascular populations, not just trauma.

## Dosing of Rehab

Determining the exact timing, intensity, and duration of PT/OT to optimize outcomes while managing healthcare resources.

## Pharmacology

Executing large, longitudinal trials for PLP management that go beyond opioids to evaluate true functional interference.

## Household Ambulators

Expanding prosthetic component research to include limited ambulators, historically excluded from clinical trials.