

Alignment of BIOMESSM Tool Risk Stratification With Specialist Referral Patterns: Phase 1 Validation Results



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Don't Delay, Refer Today!

BIOMESSM

The BIOMESSM Tool helps to identify barriers to wound healing, wounds at risk for complications, and when to refer to a wound specialist.

Barriers to Wound Healing

- B Blood Flow
- I Infection/Bioburden
- O Offloading/Overloading
- M Metabolic/Morbidities
- E Exudate/Edema
- S Social/Economic

How to use the BIOMESSM Tool

- Assess each component of BIOMES.
- Check each component present.
- Add up the number of barriers present.
- Follow recommendations based on BIOMES Risk score.

Total BIOMESSM Score:

Risk Assessment Guidance

- 0 BIOMES** (Low Risk): Continue to assess
- 1 BIOMES** (Moderate Risk): Consider referral to wound specialist
- ≥2 BIOMES** (High Risk): Do not delay, refer to wound specialist now

2 weeks without improvement: refer to wound specialist

Follow Wound Balance recommendations for early intervention

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Scan here for the latest version of the BIOMESSM Tool

PILOT STUDY

Sample Size

124 responses (n=124); wound duration was included in 89 responses (n=89), among 7 wound care providers in wound clinics

Demographics

Sex
 Male: 58.1% (n = 72)
 Female: 41.9% (n = 52)

Age
 Mean: 65.9 years
 Range: 20–102

Race
 White: 80.6% (n = 100)
 Black or African American: 11.3% (n = 14)
 Two or More Races: 6.5% (n = 8)
 American Indian or Alaska Native: 0.8% (n = 1)
 Asian or Asian-American: 0.8% (n = 1)

Ethnicity

Not Hispanic or Latino: 83.9% (n = 104)
 Hispanic or Latino: 16.1% (n = 20)

Wound Type

Diabetic Foot Ulcer: 32.3% (n = 40)
 Atypical/Other: 23.4% (n = 29)
 Pressure Injury: 21.0% (n = 26)
 Venous Leg Ulcer: 17.7% (n = 22)
 Arterial Ulcer (PAD): 5.6% (n = 7)

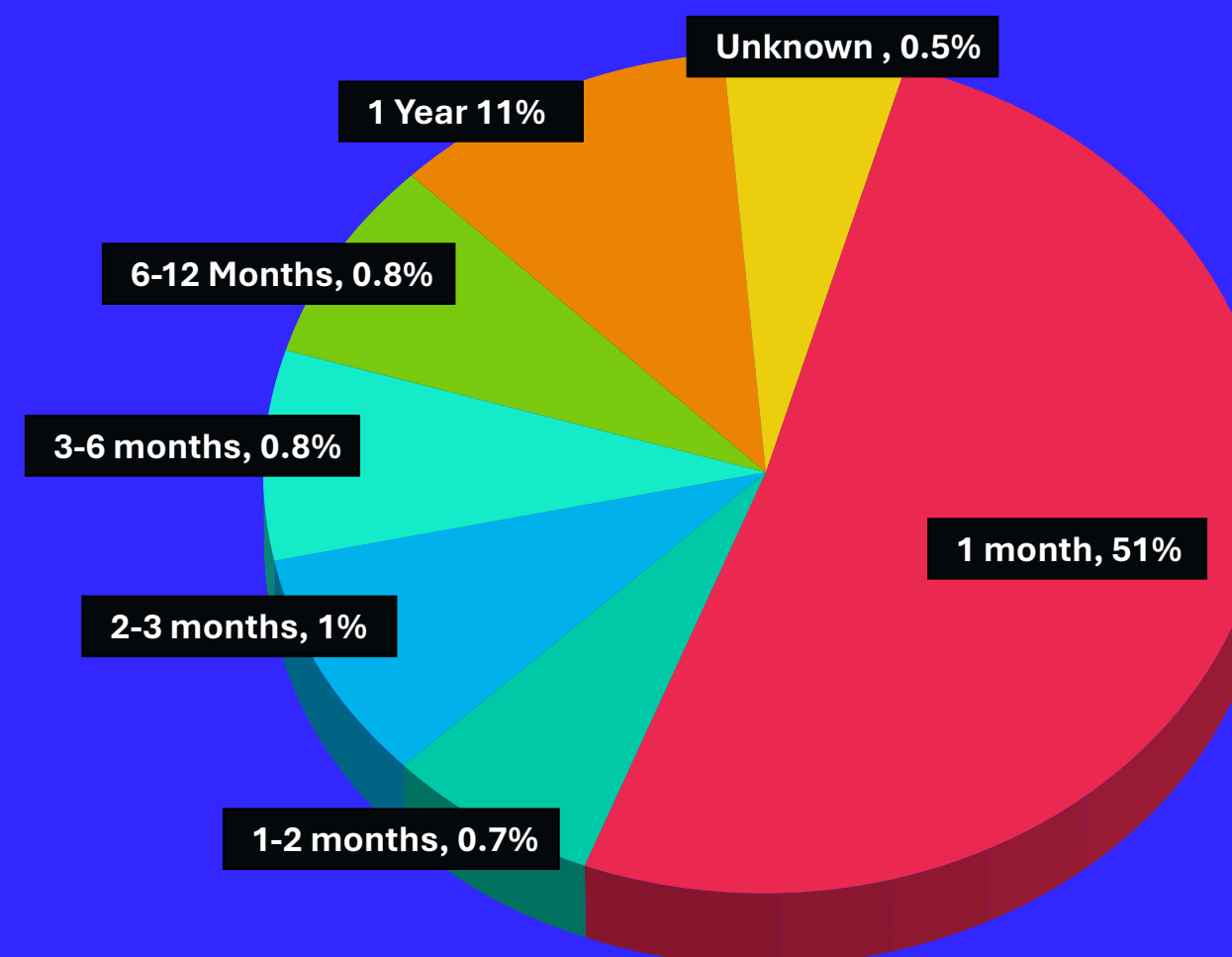
Number of Comorbid Conditions Impacting Wound

Count (n)	Percent (%)
0 Conditions:	1 0.8%
1 Conditions:	17 13.7%
2 Conditions:	33 26.6%
3 Conditions:	19 15.3%
4 Conditions:	7 5.6%
5 Conditions:	9 7.3%
6 Conditions:	37 29.8%

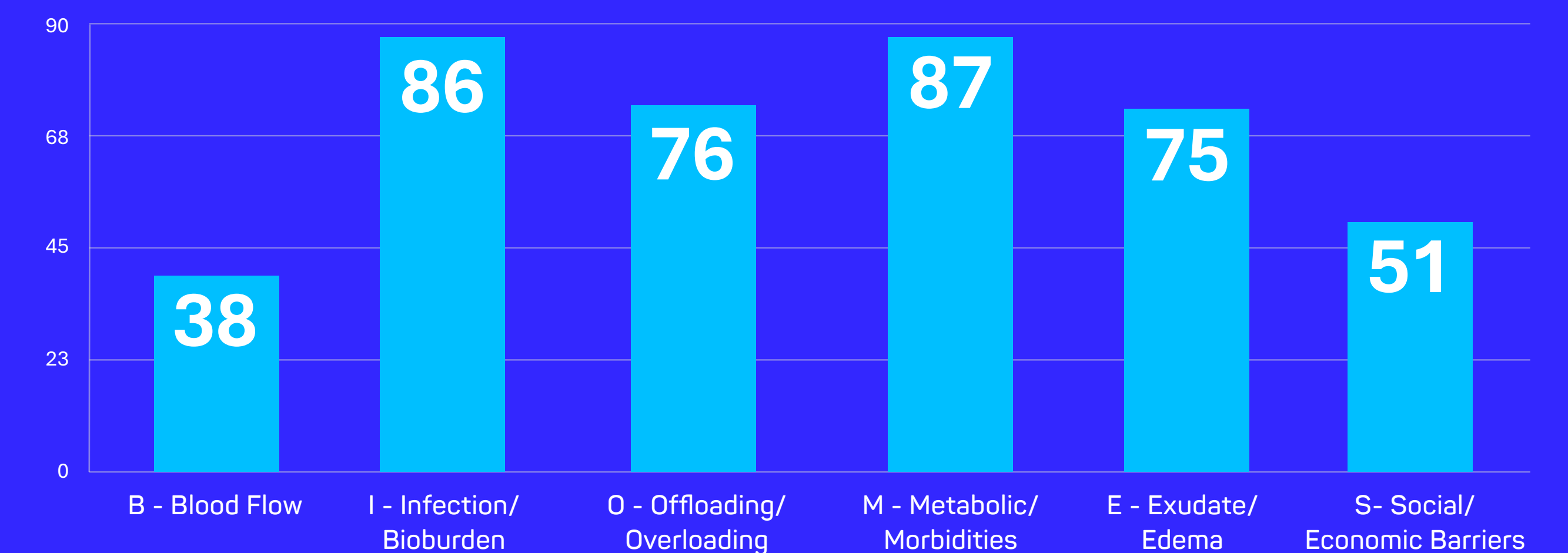
Total BIOMESSM SCORE

BIOMES SM	Count	Percentage
0	2	1.6%
1	9	7.3%
2	25	20.2%
3	33	26.6%
4	24	19.4%
5	26	21.0%
6	5	4.0%

Wound Duration (prior to first visit n=89)

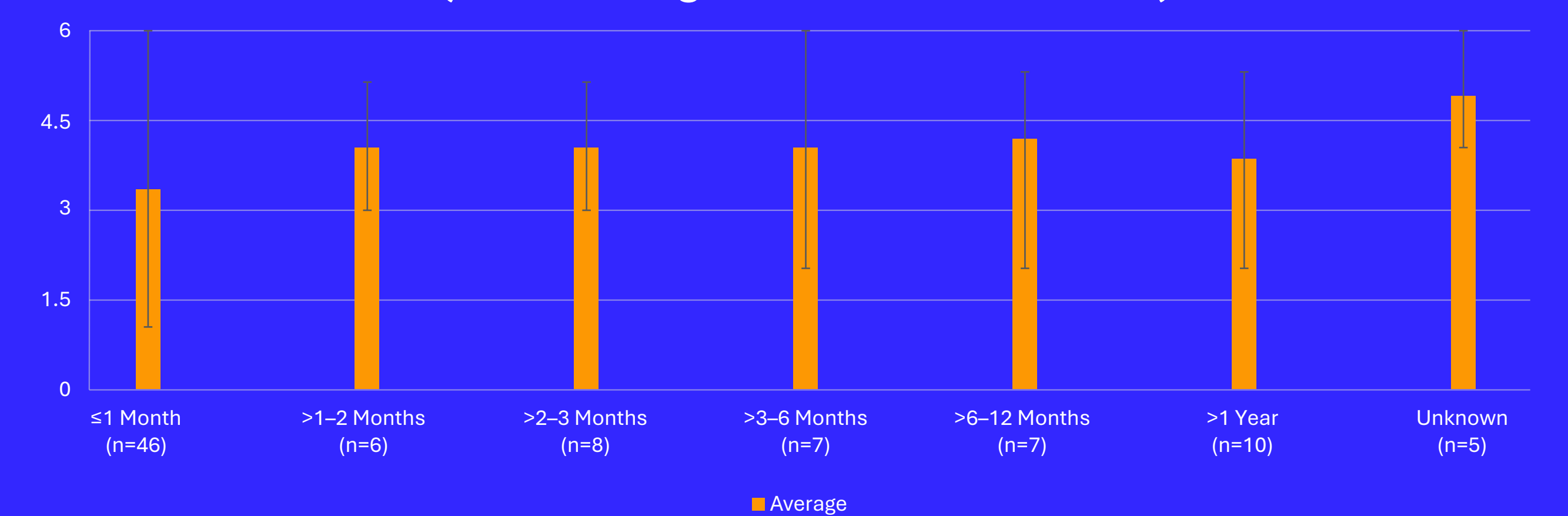


BIOMESSM Components Total Present by Barrier (n=124)



*Two individuals who had a BIOMESSM score of zero. Both are white, non-Hispanic males in their early 60s with one comorbid condition each and wounds categorized as atypical/other.

Average BIOMESSM Score by Wound Duration (with Range and Count n=89)



Introduction

The BIOMESSM tool was developed to support non-wound specialist clinicians in identifying wounds that warrant early referral to specialty care based on the presence of key barriers to healing. Prior to deployment in non-specialist settings, it is essential to confirm that the tool's risk thresholds align with the clinical complexity of patients who are already being referred to wound care specialists. Phase 1 of this validation study evaluated where referred patients fall on the BIOMESSM risk scale when assessed by wound care specialists.

References

- World Union of Wound Healing Societies (WUWHS). (2025). Implementing wound balance: Outcomes and future recommendations. Wounds International. <https://www.woundsinternational.com>
- Wounds International. (2023). Wound balance: Achieving wound healing with confidence. Wounds International. <https://www.woundsinternational.com>

Methods

A multicenter observational validation was conducted in wound specialty settings. Wound care specialists completed structured assessments for consecutive patients based on the time of specialty evaluation, documenting wound etiology, duration, comorbidities, and the presence of BIOMESSM component: Blood flow, Infection/Bioburden, Offloading/Overloading, Metabolic/Morbidities, Exudate/Edema, and Social/Economic factors. BIOMESSM scores ranged from 0–6 based on the number of barriers identified. Descriptive analyses characterized score distribution and domain prevalence among referred patients.

Results

Patient assessments (n=124) were completed across a range of wound types, including diabetic foot ulcers, venous leg ulcers, pressure injuries, arterial ulcers, and atypical wounds. The majority of referred patients exhibited one or more BIOMESSM barriers, with most clustering in the moderate- to high-risk categories (≥1 BIOMESSM component). Higher BIOMESSM scores were observed in wounds of longer duration and in patients with multiple comorbid conditions. Infection/bioburden, metabolic/morbidity, offloading/overloading, and exudate/edema were the most frequently identified barriers. Very few patients presented with a BIOMESSM score of zero, indicating minimal healing barriers at the time of referral.

Discussion

Phase 1 findings demonstrate strong alignment between BIOMESSM risk stratification and real-world specialist referral patterns. Patients presenting to wound care specialists predominantly fall within the BIOMESSM moderate- and high-risk categories the tool is designed to trigger for referral. These results support the clinical face validity of BIOMESSM as a referral screening framework and provide a foundation for subsequent validation in non-specialist settings to assess impact on referral timing and outcomes.

Trademarked Items: **BIOMESSM Tool**