



Optimizing Outcomes in the Management of Stage III and IV Pressure Ulcers

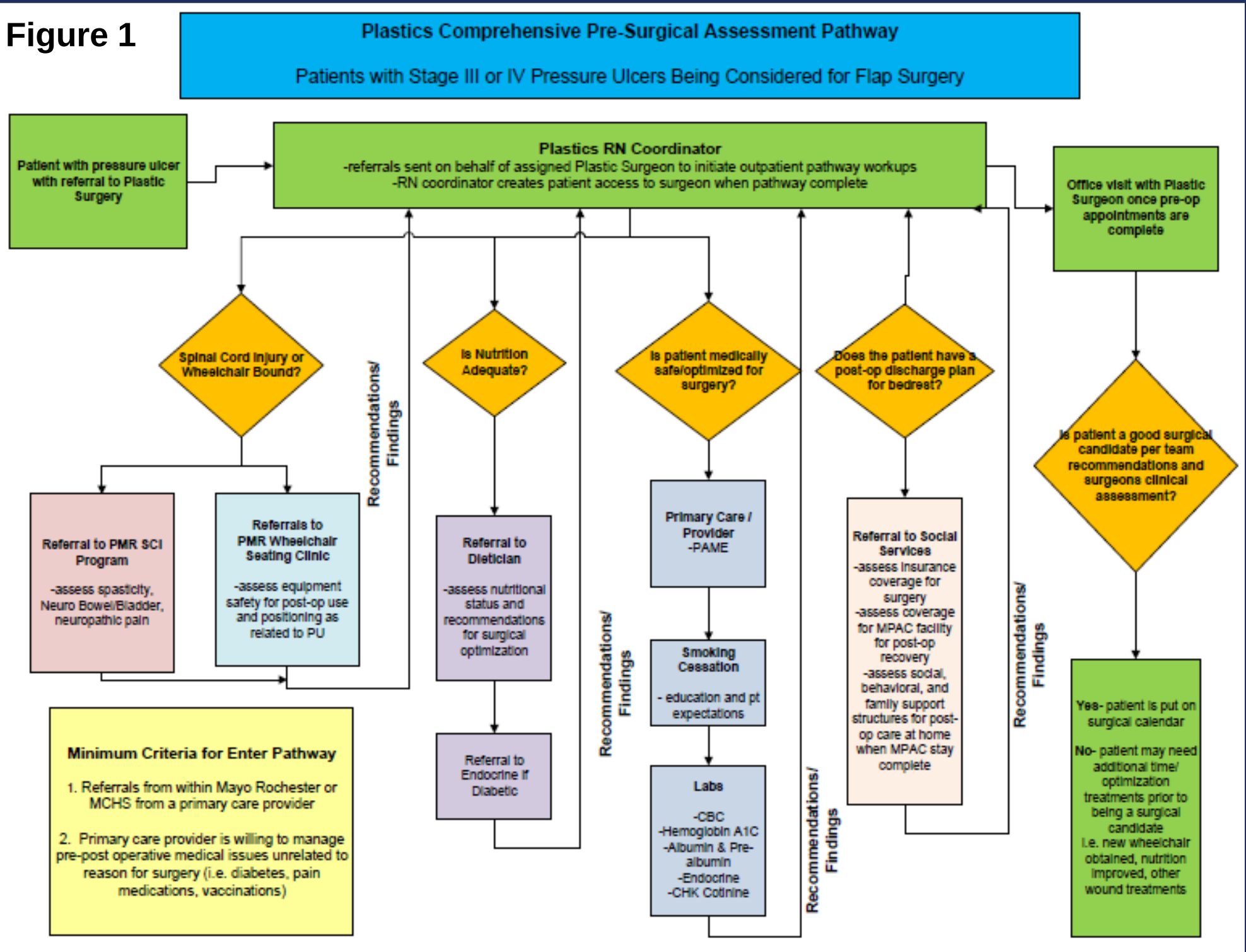
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Background

Management of stage III and IV pressure ulcers remains a difficult problem with reported recurrence rates of 12 to 82%. Screening spinal cord injury patients prior to pressure ulcer flap surgery provides the opportunity to determine and to address individual risk factors that may impact healing and pressure ulcer recurrence. We designed and operationalized a standardized screening pathway to measured the impact on 30-day hospital readmission and length of hospital stay (**Figure 1**). Our goal was to develop and to implement a multidisciplinary pressure ulcer pathway to improve outcomes.



Methods

We retrospectively reviewed spinal cord injury patients assessed for a stage III & IV pressure ulcer of the ischial tuberosity, trochanter or sacrum. Data was collected on 160 patients post-pathway (2014 to 2018) and 168 pre-pathway for internal control (2010 to 2014).

Patients completed 5 consultations:

- Medicine
 - comorbidities/medications
- Physical Medicine and Rehabilitation
 - bowel/bladder/spasticity/pain
- Seating
 - equipment/transfers/rehabilitation
- Dietetics
 - nutritional optimization
- Social Work
 - insurance/discharge planning

Outcomes included readmission rates, length of stay (LOS) and flap failure rates.

Results

208 candidates were deferred from surgery due to ongoing medical risks such as smoking or uncontrolled diabetes (**Table 1**). 38 patients underwent flap reconstruction. Implementation of the pathway decreased inpatient stay from 26 days to 8 days ($p<0.001$), transitional facility stay from 31 to 19 days ($p<0.04$), 30-day readmission rate from 21% to 3% ($p<0.001$), and 2-year flap failure rate from 17% to 5% (<0.04) (**Table 2**).

Table 1. Reasons for surgical deferral

	Pre-pathway (n=58)	Post-pathway (n=122)
Stage I or II wound with recommendation of local wound care	18	46
Patient not local or willing to stay close to facility post-op	16	32
Patient refused consults	9	4
Active smoking and refusal to quit	3	10
End of Life/Hospice	3	3
Morbid obesity, uncontrolled diabetes (A1C>8%) or poor nutrition	7	10
No insurance coverage for post-op facility	0	8
Inability to comply due to cognitive impairments: severe dementia or traumatic brain injury or ventilator-dependent	2	5
End stage liver, lung or kidney disease	0	4

Table 2. Surgical outcomes pre- and post-implementation of the pressure sore pathway

	Pre-pathway n=110 (%)	Post-pathway n=38 (%)	p
PMR consult	32 (29)	29 (76)	<0.001
Seating clinic consult	20 (18)	23 (61)	<0.001
Social service consult	5 (5)	30 (79)	<0.001
Nutrition consult	2 (2)	27 (71)	<0.001
Number of consult	0 (0-1)	3 (2-4)	<0.001
- 0	69 (63)	3 (8)	
- 1	24 (22)	4 (11)	
- 2	16 (15)	6 (16)	
- 3	1 (1)	7 (18)	
- 4	0 (0)	18 (47)	
30-day hospital readmission	21 (19)	3 (8)	<0.001
Hospital length of stay	26 (9-44)	8 (7-11)	<0.001
Hospital and MPAC length of stay	31 (16-50)	19 (8-44)	0.04
1-year complication	36 (33)	13 (34)	0.87
1-year flap failure	20 (18)	6 (16)	0.74
2-year flap failure	19 (17)	2 (5)	0.04
Recurrence requiring surgery	27 (25)	4 (11)	0.05

Legends: MPAC (Mayo Post-Acute Care)

Conclusions

Patients who completed the recommended pathway consultations with emphasis on optimization of risk factors achieved better outcomes on all metrics. Surgery should be reserved for those who are medically optimized to avoid complications.