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Identifying Gaps in Care: Assessment of Ancillary Support Service Utilization for Lower Extremity Amputees at a Large Tertiary Care Center

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Background

- 150,000-185,000 Lower Extremity Amputations (LEA) annually in US^{1,2}
- Most commonly for peripheral vascular disease and diabetes
- 3.6 million amputees predicted by 2050¹
- Morbidity and mortality post-LEA are significant^{3,4}
 - 55% second amputation in 2-3 years
 - 50% Five year mortality
- Quality of Life (QoL) also an issue post amputation⁵
 - Issues with independency, mobility, and isolation
- Support groups and other ancillary services may improve QoL at no-to-low cost^{6,7}
 - Meet evolving needs of amputees
 - Understanding recovery process
 - Social support and networking

Problem Statement

Are there services that could benefit a majority of patients undergoing an amputation that are available at Lehigh Valley Hospital-Cedar Crest, but are not used consistently at present?

Methods

- Retrospective chart review of LEA patients at LVH-CC
- 100 charts Identified using CPT Codes
 - LEAs between 12/5/2016 and 2/4/2019
- Inclusion Criteria:
 - LEA at LVH-CC within date range
- Exclusion Criteria:
 - Age <18
 - Amputation revision
 - Amputation at outside facility
- Excel and SAS used for statistical analysis

CPT Codes for Lower Extremity Amputation	
27295	Disarticulation of hip
27590	Amputation, thigh, through femur, any level;
27591	Amputation, thigh, through femur, any level; immediate fitting technique
27592	Amputation, thigh, through femur, any level; open, circular (guillotine)
27594	Amputation, thigh, through femur, any level; secondary closure or scar revision
27596	Amputation, thigh, through femur, any level; re-amputation
27598	Disarticulation at knee
27880	Amputation, leg, through tibia and fibula;
27881	Amputation, leg, through tibia and fibula; immediate fitting technique
27882	Amputation, leg, through tibia and fibula; open, circular (guillotine)
27884	Amputation, leg, through tibia and fibula; secondary closure or scar revision
27886	Amputation, leg, through tibia and fibula; re-amputation
27888	Amputation, ankle, through malleoli of tibia and fibula (eg, Syme, Pirrogoff type procedures), with plastic closure and resection of nerves
27889	Ankle disarticulation
28800	Amputation, foot; midtarsal (eg, Chopart type procedure)
28805	Amputation, foot; transmetatarsal
28810	Amputation, foot; metatarsal, with toe, single
27295	Amputation, toe; metatarsophalangeal joint
27590	Amputation, toe; interphalangeal joint

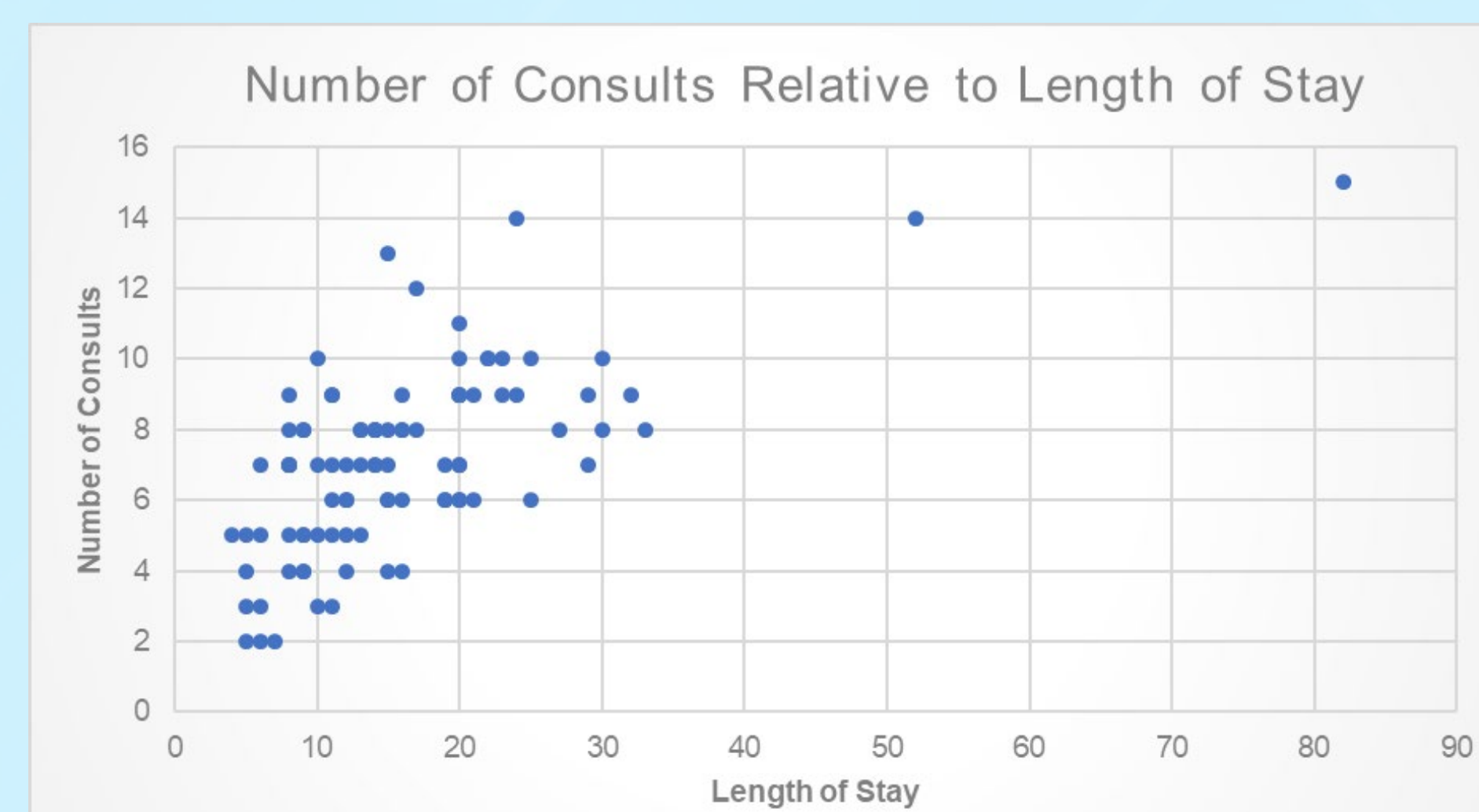
Results

- 92 LEA cases included
 - 87% of surgeries unplanned
 - 76% above-the-knee
- Mostly old, sick population
 - Average of 27 diagnoses on admission

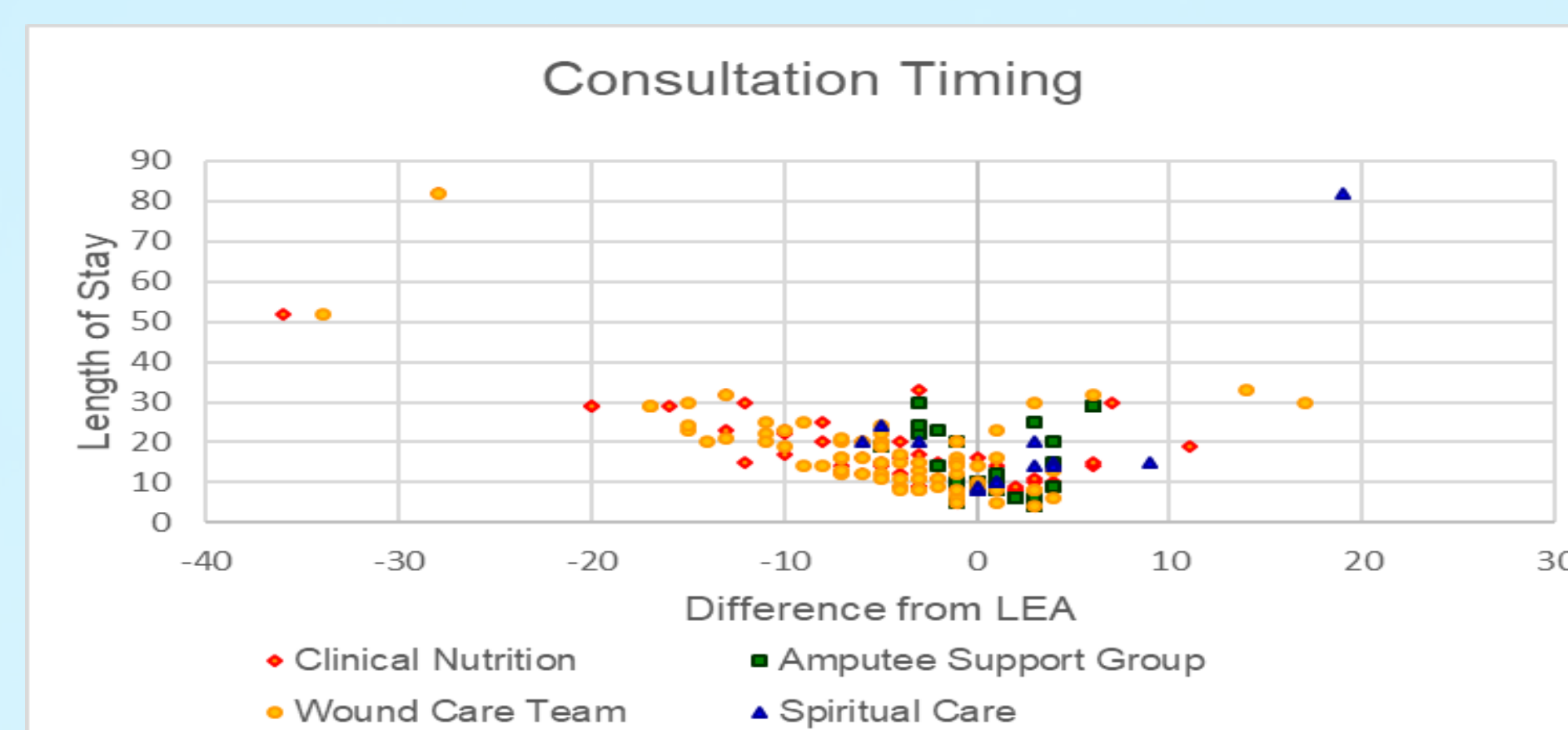
Patient Characteristics	
Gender	
Male	57 (62%)
Female	35 (38%)
Age	
40-49	7 (8%)
50-59	17 (18%)
60-69	20 (22%)
70-79	31 (34%)
80-89	15 (16%)
90-99	2 (2%)
Comorbidities	
Hypertension	73 (79%)
Diabetes Mellitus	67 (73%)
Chronic Kidney Disease	43 (47%)
Peripheral Vascular Disease	71 (77%)

- Length of Stay (LoS)
 - Ranged 4 to 82 with mean of 16
- 657 consults placed to 41 unique services
- Patients received 2 to 15 consults, mean 7

Consult Utilization						
Service	Number of times consulted	Consult on Mean Day of Stay	Mean LoS	Consult Before LEA	Day of LEA	After LEA
Amputee Support Group	29 (32%)	7	14	9	4	16
Clinical Nutrition	61 (66%)	4	18	44	2	15
Diabetes Education	1 (1%)	7	14	0	0	1
Dietician	10 (11%)	3	18	9	0	1
Endocrinology	5 (5%)	15	28	2	0	3
Gastroenterology	11 (12%)	10	21	7	0	4
General Surgery	22 (24%)	4	21	19	1	2
Hospital Medicine	14 (15%)	2	13	9	0	5
Infectious Disease	51 (55%)	2	18	47	1	3
Neurology	11 (12%)	9	25	6	0	5
Occupational Therapy	11 (12%)	8	16	4	0	7
Orthopedic surgery	21 (23%)	2	17	21	0	0
Pain Management	5 (5%)	13	25	2	0	3
Palliative Medicine	22 (24%)	7	21	14	2	6
Physiatry	44 (48%)	7	16	14	2	28
Physical Therapy	12 (13%)	5	16	5	0	7
Podiatric Surgery	9 (10%)	2	17	9	0	0
Psychiatry	19 (21%)	8	21	12	0	7
Smoking Cessation	3 (3%)	4	13	2	0	1
Spiritual Care	14 (15%)	10	19	3	3	8
Urology	16 (17%)	9	20	7	0	9
Vascular Surgery	57 (62%)	2	18	56	0	1
Wound Care Team	76 (83%)	4	18	59	4	13



	Consulted Mean LoS	Not Consulted Mean LoS
Amputee Support Group	14	17
Spiritual Care	19	15
Clinical Nutrition	17	14
Wound Care	17	12



Discussion

- Sick population requiring multidisciplinary care
- Needs varied among LEA patients
 - Rarely to same combination of teams
 - Longer LoS correlated with more consults
 - Some services used only once
 - Others in up to 83% of patients
- Timing of consultation varied widely
 - Some primarily before LEA, some after
- Services with potential benefit with little cost
 - Minority of patients, primarily after amputation
 - Amputee Support Group and Spiritual Care
- Commonly used services
 - Majority of patients, primarily before LEA
 - Wound Care and Clinical Nutrition
- Areas Health System can be improved
 - Improving service utilization to address patient values may improve QoL post amputation
- Leadership needed for multidisciplinary-team approach
- Limited by inability to assess QoL directly

Conclusions

- Sick population with multiple comorbidities
- Services such as Amputee Support Group and Spiritual Care appear underutilized
- Surgery order set may improve utilization
- Clinical Nutrition and Wound Care used for a majority but not all patients prior to LEA
- Care pathways for those with limb threat might improve utilization
- Takes coordination of many professionals from different specialties
- Next Steps
 - Assess QoL in those with and without
 - Implement Order Set/Care Pathways

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