

Purpose

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- Implement a quality improvement project to assist an acute care facility in eliminating hospital acquired pressure ulcer (HAPU) development and/or progression in patients with a Developmental Disability (DD).
- Improve organizational structure and process, clinical outcomes, quality, and cost within this vulnerable population.

Background

- DD's are chronic conditions related to mental and/or physical deficits that can occur anytime during development up to age 22.²
- 5 million Americans have a DD.⁵
- In 2008, the prevalence of DD's increased by 17.1%.²
- Complicated conditions put DD patients at a higher risk for developing a pressure ulcer.²
- The cost of a single pressure ulcer ranges from \$20,900 to \$151,700.¹
- This patient population requires specific equipment and specialized care to prevent pressure ulcers.⁴
- The literature suggests there is a lack of education and standardized protocols.⁴

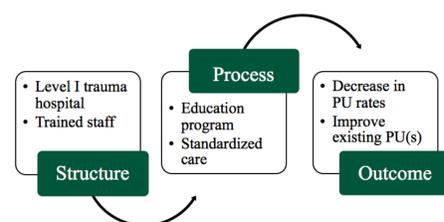
Solution

- Development of a comprehensive education program, infrastructure support, and workflow changes for healthcare providers.
- Phase I: quantify pressure ulcer (PU) problem, identify educational needs, and development of an education workshop (fig.2), protocol, patient passport, FYI flag (fig.3), system list (fig.4) and order set.
- Phase II: implement above infrastructure changes and workflow, including interdisciplinary team huddle and ongoing education through health technologies.
- Phase III: continuous HAPU monitoring for compliance & outcomes, including process improvement initiatives.

Framework

- Donabedian's Quality Framework was used to guide this project (fig. 1).³
- Encompasses clinical expertise, services, resources, and programs in the delivery of health care.³
- Implementation of intervention is based on structure, process, and outcome.³
- Structure: acute care facility, resources and qualified staff.
- Process: delivery of education program and execution of protocol and tools for support.
- Outcome: change in clinical practice and professional behavior to improve HAPU's and organizational performance indicators.

Figure 1: Donabedian's Quality Framework



Methods

Setting:

- Non-profit, magnet designated, level I trauma center, 1,011 beds.

Design:

- Observational retrospective chart review, pre and post intervention.

Sample:

- 30 patient charts pre-intervention and 22 patient charts post-intervention were reviewed that were diagnosed with a DD prior to age 22 and were ≥ 18 years of age.

Intervention:

- Implementation of phase I (fig. 2).

Interval Data Collection:

- Pre-intervention: October 1, 2015 to April 26, 2016.
- Post-intervention: April 27, 2016 to October 25, 2016.

Analysis:

- Student's independent t-test and Mann Whitney U test were used to compare means and Pearson's chi-square for categorical values. P-value set at 0.1 for statistical significance.
- A test of proportions using the z-test was calculated to compare pressure ulcer progression and improvement between the pre-education group and the post-education group.

Intervention

- Designated admitting units include: medical ICU, medical surgical ICU, a step down unit, and the neuroscience unit.
- The staff on these units participated in a three-hour education workshop on patients with DD's in April, 2015.
- Trained staff included: registered nurses, physical, occupational, and speech therapists, lift team, certified wound ostomy nurses, respiratory therapy, dietitian, and case management.

Figure 2: Phase I

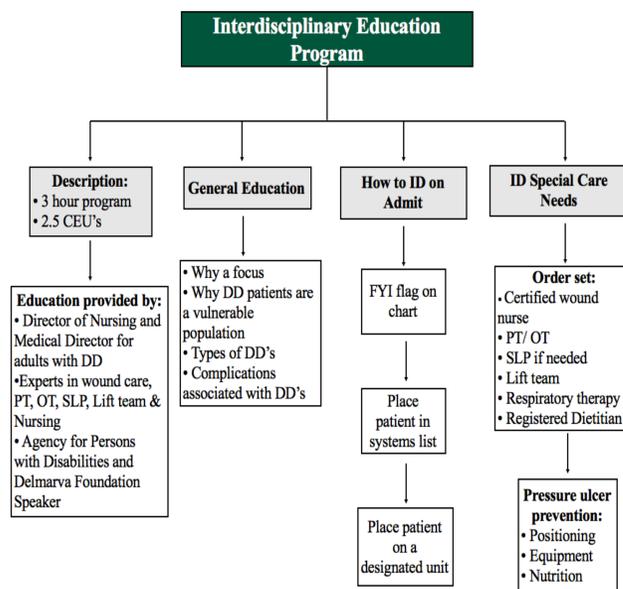


Figure 3: FYI Flag on Chart

CAUTION: Significant Developmental and Physical Disabilities

Figure 4: Systems List

- ▼ Sign Dev/ Phy Disabilities
- ⚠ Sign Dev/ Phy Disabilities
- ▶ Social Work
- ▶ Speech Language Pathology

Results

Table 1: Demographic and Clinical Information of the Pre and Post Intervention Samples

Descriptive	Pre-Education (N=30)	Post-Education (N=22)	P Value
Age	Mean= 40.47 years	Mean= 38.32 years	P= 0.623
Gender	Males- 33.3% Females- 66.7%	Males- 68.2% Females- 31.8%	P= 0.014
Race	Caucasian- 73.3% African American- 10.0% Puerto Rican- 16.7%	Caucasian- 63.6% African American- 31.8% Puerto Rican- 4.5%	P= 0.715
DD Dx	Cerebral Palsy- 30.0% Spina Bifida- 30.0% Developmental Delay- 16.7% Autism- 6.7% Down Syndrome- 6.7%	Cerebral Palsy- 45.5% Spina Bifida- 27.3% Developmental Delay- 9.1% Autism- 5.5% Down Syndrome- 9.1%	P= 0.882
Admit Dx	UTI- 23.3% AMS- 13.3% Seizures- 13.3% ARF- 6.7%	UTI- 13.6% AMS- 9.1% Seizures- 9.1% ARF- 9.1%	P= 0.682
Mobility	Ambulatory- 26.7% Minimal Assist- 26.7% Dependent- 46.7%	Ambulatory- 0.0% Minimal Assist- 22.7% Dependent- 77.3%	P= 0.011
PU on admit	Yes- 16.7% No- 83.3%	Yes- 27.3% No- 72.7%	P= 0.360
Clinical course	Improve- 0% Same- 16.7% Extend- 3.3%	Improve- 22.7% Same- 4.5% Extend- 0%	
HAPU	Yes- 23.3% No- 76.7%	Yes- 4.5% No- 95.5%	
Contractures	Yes- 16.7% No- 83.3%	Yes- 36.4% No- 63.6%	P= 0.109
LOS	Mean= 15.6 days	Mean- 10.31 days	
Skin RN consult	Yes- 63.3% No- 36.7%	Yes- 100% No- 0%	P= 0.002

Figure 4: Test of Proportions

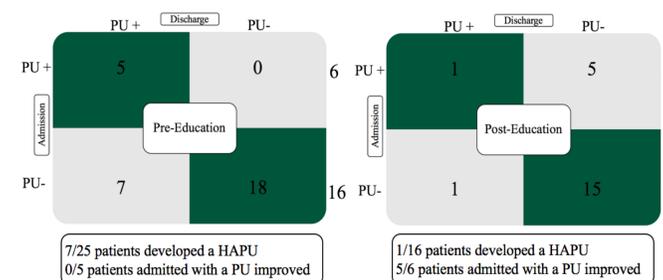


Table 2: Patients Pressure Ulcer Outcomes

	Pre-education	Post-education	Z-test	P-value
Progressed	28%	6.3%	2.011*	<0.044*
Improved	0%	83.3%	5.481*	<0.001*

* Z > 1.96 falls within the rejection region and p is significant at a 0.05

Discussion

- Descriptive statistics were not significantly different in age, race, DD diagnosis, admit diagnosis, or PU on admit.
- Post-education sample had more PU's, contractures and were less mobile on admit.
- Post-education group appeared to have more extensive diseases, yet outcomes were significantly improved.
- The incidence of PU improvement was significantly greater in DD patients post-education ($p < 0.001$).
- The incidence of pressure ulcer progression was significantly greater in DD patients pre-education ($p < 0.044$).
- This intervention appears to be statistically and clinically significant in the reduction and/or progression of HAPU's.
- This project suggests that ongoing patient morbidity and costs associated with HAPU's may decrease with this initiative.

Future Steps

- Implementation of phase II and III.
- Go live for the FYI flag, passport, system list, interdisciplinary team huddle and DD nursing care / specialty consult order set.
- Implement nutrition and contracture protocols.
- Further evaluation of initial patient outcomes at 3 and 6 months post full implementation.
- Implement a nurse specialist liaison for monitoring of outcomes and continual process improvement initiatives: pressure ulcers, contractures, weight loss, restraint use and length of stay.
- With addition of phase II and III, this study suggests outcomes may further improve and ensure appropriate care.

References

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5. U.S. Department of Health and Human Services. (2015). Data and Evaluations. Retrieved from <http://www.acl.gov/DataOutcomes/Index>

Acknowledgements

- I would like to thank Brian T. Graves PhD, ARNP, ACNP-BC, my faculty supervisor for his continual encouragement and dedication in ensuring my success with this project.
- I would also like to thank Janet Davis DNP, RN, NE-BC, CPHQ; Senior Vice President and Chief Nursing Officer along with the interdisciplinary team for allowing me to participate in this new quality improvement program.
- Furthermore, I want to thank Robin Atkins, LCSW and Rick Ash for guiding me through the complex organizational aspects of the hospital.
- Lastly, I want to thank Jason Beckstead, PhD for assisting me in my statistical analysis development.