

Lehigh Valley Health Network LVHN Scholarly Works

USF-LVHN SELECT

The impact of a multidisciplinary clinic on pregnancy management, care, and perinatal outcomes in women with cardiovascular disease

Lauren Walheim BS

USF MCOM-LVHN Campus, Lauren.Walheim@lvhn.org

Joanne Quiñones MD, MSCE

Lehigh Valley Health Network, Joanne_N.Quinones@lvhn.org

Amy M. Ahnert MD

Lehigh Valley Health Network, Amy_M.Ahnert@lvhn.org

Kailyn Mann DO

Lehigh Valley Health Network, kailyn.mann@lvhn.org

Follow this and additional works at: <https://scholarlyworks.lvhn.org/select-program>

Part of the [Medical Education Commons](#)

Published In/Presented At

Walheim, L. Quiñones, J. Ahnert, A. Mann, K. (2019, March). *The impact of a multidisciplinary clinic on pregnancy management, care, and perinatal outcomes in women with cardiovascular disease*. Poster Presented at: 2019 SELECT Capstone Posters and Presentations Day. Kasych Family Pavilion, Lehigh Valley Health Network, Allentown, PA.

This Poster is brought to you for free and open access by LVHN Scholarly Works. It has been accepted for inclusion in LVHN Scholarly Works by an authorized administrator. For more information, please contact LibraryServices@lvhn.org.

The impact of a multidisciplinary clinic on pregnancy management, care, and perinatal outcomes in women with cardiovascular disease

Lauren Walheim BS, Joanne Quiñones MD, Amy Ahnert MD, Kailyn Mann DO

Lehigh Valley Health Network, Allentown, Pennsylvania

Introduction

- Cardiovascular disease in pregnancy:
 - Complicates 1-4% of pregnancies^{1,2,3}
 - Leading cause of indirect death^{1,2,3}
- Physiological cardiovascular changes in pregnancy:
 - Optimize oxygen delivery to fetus
- Heart in Pregnancy Program:
 - Started in March 2010
 - Multidisciplinary visits with both cardiologist and maternal fetal medicine (MFM)

Problem Statement

To describe obstetric and cardiac management and outcomes of pregnant women with pre-existing cardiac disease seen in a multidisciplinary clinic.

Methodology

- Location:
 - Multidisciplinary clinic (HPP)
 - Hospital with Level I Trauma and Level IV NICU designation as well as Level III subspecialty care
- Retrospective record review
 - Women entered into database upon each visit to HPP
 - Inclusion criteria: seen between March 2010 and June 2017
 - Exclusion Criteria:
 - Never pregnant
 - No underlying cardiac disease
 - Cardiac symptoms limited to pregnancy
 - Delivered at outside hospital

REFERENCES

1. Foley M. (2017). Maternal cardiovascular and hemodynamic adaptations to pregnancy. In K. Eckler (Ed), *UpToDate*. Retrieved May 8, 2018, from <https://www.uptodate.com/contents/maternal-adaptations-to-pregnancy-cardiovascular-and-hemodynamic-changes-H1>
2. Cunningham et al. (2013). *Williams Obstetrics, Twenty-Fourth Edition*. Retrieved from: <http://accessmedicine.mhmedical.com.ezproxy.lib.usf.edu/context.aspx?bookid=1057§ionid=59789106>
3. Oakley, C. and Warnes, C. (2007). *Heart disease in pregnancy*. Malden, Mass.: Blackwell Pub./BMJ Books.
4. Siu S.C., Sermer M., Colman J.M., Alvarez A.N., Mercier L.A., Morton B.C., ... Sorensen S. (2001). Prospective Multicenter Study of Pregnancy Outcomes in Women With Heart Disease. *Circulation*, 104, 515-21. doi: 10.1161/hc3001.093437
5. Silversides C.K., Grewal J., Mason J., Sermer M., Kiess M., Rychel V., ... Siu S.C. (2018). Pregnancy Outcomes in Women With Heart Disease: The CAREPREG II Study. *Journal of the American College of Cardiology*, 71(21), 2419-2430. doi: 10.1016/j.jacc.2018.02.076

Results

Records available for review after exclusion criteria: n=189

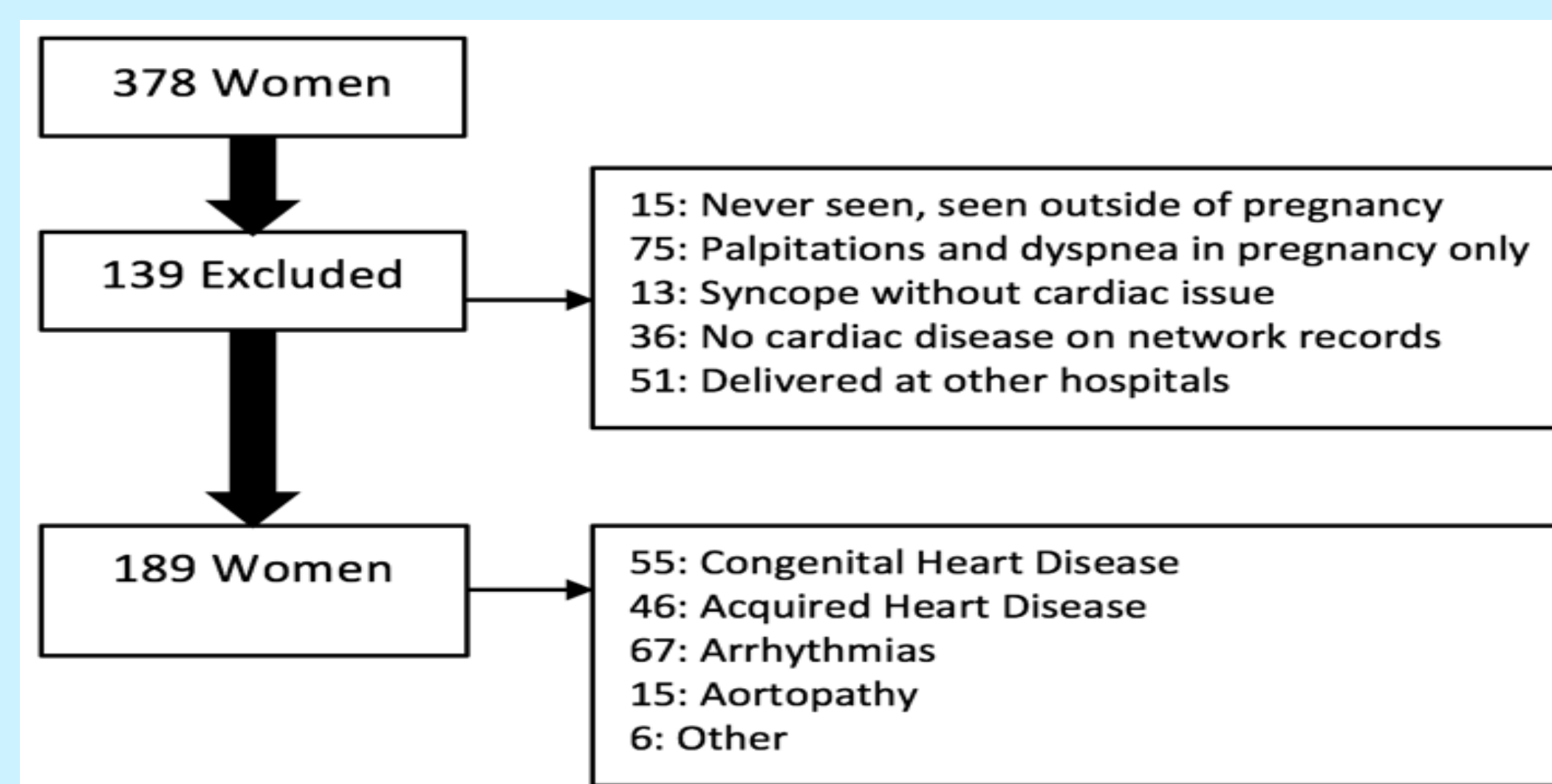


Figure 1. Flow Diagram for Included and Excluded Patients

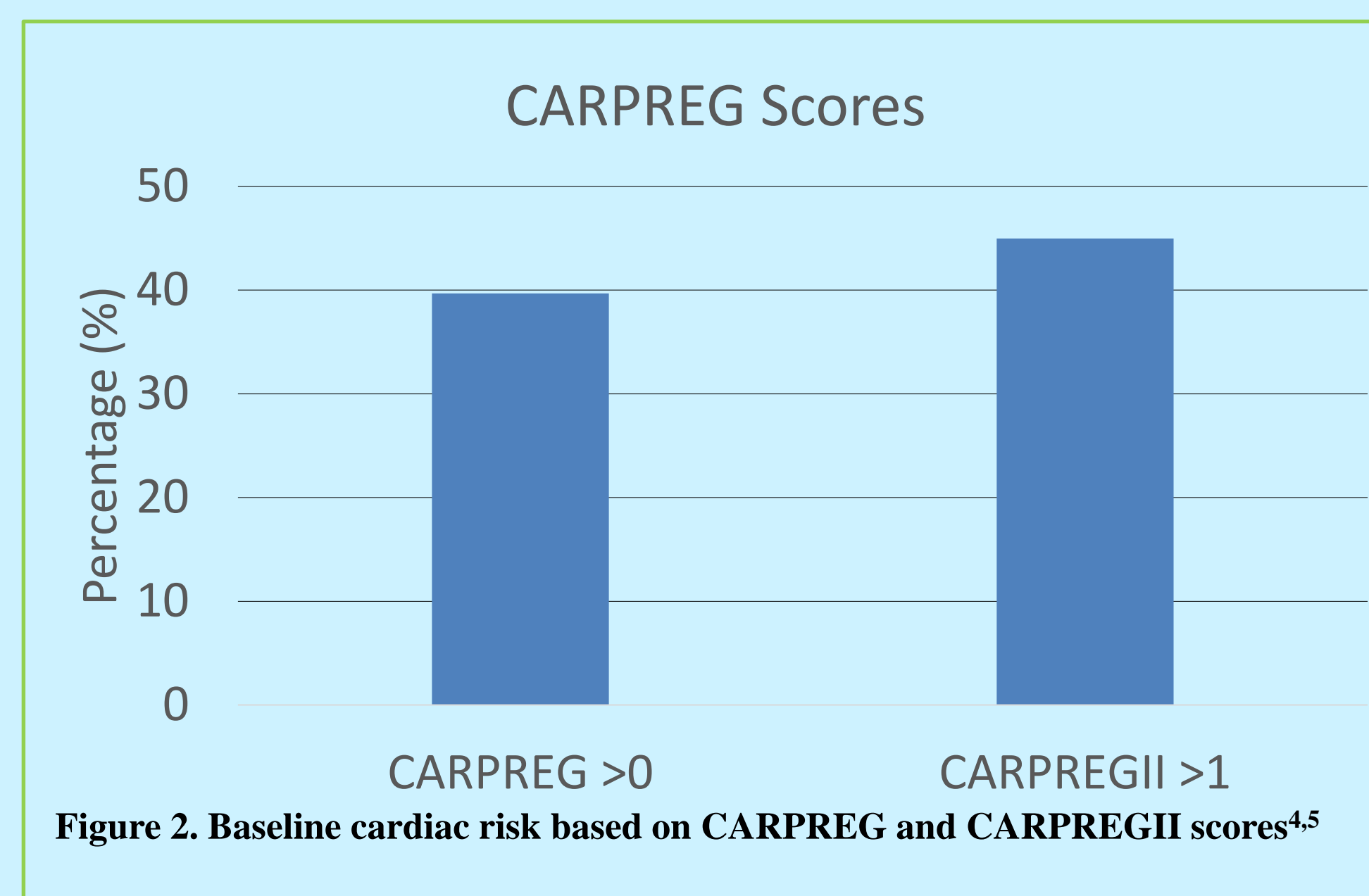


Figure 2. Baseline cardiac risk based on CARPREG and CARPREGII scores^{4,5}

Discussion

- Leading cause of indirect maternal death in developed world^{1,2,3}
- Maternal mortality rate (MMR) is used as quality marker of healthcare
- **Improving quality of care** through multidisciplinary approach
 - More standard work based on diagnosis
 - Risk stratification
 - Clearer communication amongst specialists

Conclusions

- This descriptive project suggests areas for more standardized workflow for patients
- Future studies could look into the difference between groups– more specifically the increased risk of women with acquired heart disease

Table 1. Cardiac Management by Diagnostic Groups

	Overall (n=189)	CHD (n=55)	Acquired (n=46)	Arrhythmias (n=67)	Aortopathy (n=15)	Other (n=6)	p value
Prenatal Management							
Prenatal Imaging							
-TTE, n (%)	139 (73.5)	41 (74.6)	39 (84.8)	50 (74.6)	5 (33.3)	4 (66.7)	<.001
-MRI + TTE, n(%)	15 (7.9)	5 (9.1)	1 (2.2)	0 (0.0)	8 (53.3)	1 (16.7)	
Fetal ECHO, n(%)	66 (34.9)	37 (67.3)	4 (8.7)	16 (23.9)	9 (60.0)	0 (0.0)	<.001
Inpatient Management							
Cardio consult n(%)							
- Antepartum	17 (9.0)	6 (10.9)	2 (4.4)	7 (10.5)	2 (13.3)	0 (0.0)	0.63
- Intrapartum	22 (11.6)	7 (12.7)	4 (8.7)	9 (13.4)	2 (13.3)	0 (0.0)	0.83
- Postpartum	35 (18.3)	9 (14.6)	10 (21.7)	13 (19.4)	4 (26.7)	0 (0.0)	0.57
Postpartum Management							
Telemetry postpartum, n(%)	26 (13.8)	3 (5.5)	5 (10.9)	16 (23.9)	2 (13.3)	0 (0.0)	0.04
Days between discharge and follow-up, n(%)	24.05±15.7	23.13±13.4	19.11 ± 13.4	27.87 ±17.4	24.71 ± 20.0	25.17±11.7	0.11
Follow up TTE, n(%)	31 (16.4)	11 (20.0)	8 (17.4)	6 (9.0)	5 (33.3)	1 (16.7)	0.17

Table 2. Complications and Outcomes by Diagnostic Groups

	Overall (n=189)	CHD (n=55)	Acquired (n=46)	Arrhythmias (n=67)	Aortopathy (n=15)	Other (n=6)	p value
Intrapartum complications	51 (27.5)	16 (29.1)	17 (37.0)	14 (20.9)	4 (26.7)	1 (16.7)	0.61
Postpartum complications	61 (32.4)	17 (31.5)	22 (47.8)	16 (23.9)	4 (26.7)	2 (33.3)	0.29
Escalation of cardiac meds	17 (9.0)	3 (5.6)	7 (15.2)	5 (7.46)	1 (6.7)	1 (16.7)	0.45
Use of diuretics	12 (6.4)	3 (5.5)	7 (15.2)	2 (3.0)	0 (0.0)	0 (0.0)	0.07
EF drop > 5%	9 (4.2)	1 (1.8)	5 (10.9)	1 (1.5)	1 (6.7)	0 (0.0)	0.11
Postpartum hemorrhage	18 (9.5)	9 (16.4)	4 (8.7)	3 (4.5)	2 (13.3)	0 (0.0)	0.21

Table 3. Neonatal Outcomes by Diagnostic Groups

	Overall (n=189)	CHD (n=55)	Acquired (n=46)	Arrhythmias (n=67)	Aortopathy (n=15)	Other (n=6)	p value
Infant resuscitation, n (%)	22 (11.8)	8 (14.8)	8 (17.8)	4 (6.0)	2 (14.3)	0 (0)	0.42
Infant admitted to NICU/transition unit, n (%)	33 (17.5)	8 (14.5)	13 (28.3)	7 (10.5)	4 (26.7)	1 (16.7)	0.44
SGA (<10 percentile), n (%)	9 (4.8)	1 (1.8)	4 (8.9)	4 (6.0)	0 (0)	0 (0)	0.70
Neonatal complications, n (%)	63 (34.2)	18 (32.7)	21 (48.8)	15 (22.7)	7 (50.0)	2 (33.33)	0.18
Neonatal length of stay (days) +/- SD	4.0 ±6.5	3.87 ±6.0	6.02 ±10.8	3.09 ±5.0	2.8 ±1.8	2.5 ±.5	<.001