Appendix A

Strength of Evidence Table

Article Title & Author	Study Purpose	Sample Characteristics	Methods	Study Results	Level of Evidence (Melnyk)	Study Limitations	Would Use as Evidence to Support Change (Yes or No)
Blackett, P., George, M., & Wilson, D. (2018). Integrating lipid screening with ideal cardiovascular health assessment in pediatric settings. *Journal of Clinical Lipidology, 12*(6), 1346-1357. doi: https://doi.org/10.1016/j.acl.2018.08.009	Reviews evidence of expert panels including the American Heart Association (AHA) support for clinical guidelines related to lipid screening and CV health	A review of literature and clinical guidelines from 7 national organizations regarding lipid and CV health screening	Non-experimental descriptive study	Findings indicate support of obesity screening and lifestyle-associated CV risk factors. Only United States preventative task force did not support universal lipid screening	Level 7: expert opinion	Lipid screening and glucose tolerance were recommended by the AHA at point of care but feasibility in the healthcare setting was not considered	Will consider AHA ideal cardiovascular health model for CV risk assessment
Busch, A., Hubka, A., & Lynch, B. (2018). Primary care provider	The purpose of this study is to measure the effects of a provider	Charts reviews of patients with BMI > 85% aged 5-18 years old	Quasi-experimental design with pre- and post-testing	After educational session, referrals and laboratory	Level 3: controlled trial without randomization	The educational session was only one hour and did not	Will refer to barriers of clinician non-adherence to

knowledge and practice patterns regarding childhood obesity. *Journal of Pediatric Health Care, 32*(6), 557-563. doi: https://doi.org/10.1016/j.pedhc.2018.04.020	education program on rates of obesity diagnosis, lifestyle education, and nutritionist referrals	corresponding to twelve primary care providers in rural healthcare center over 3 month period		testing increased by 12% but no increase in diagnosis and lifestyle education		measure clinician understanding or views of educational objective	clinical recommendations
Ehehalt, S., Wiegand, S., Korner, A., Schweizer, R., Liesenkotter, K., Partsch, C., …Reinehr, T. (2017). Diabetes screening in overweight and obese children and adolescents: choosing the right test. *European Journal of Pediatrics, 176*(1), 89-97. doi:10.1007/s00431-016-2807-6	To determine which tests are the most reliable screening methods for Type 2 diabetes in overweight or obese children	Study subjects totaled 4848 children and adolescents aged 7-17 years old without known diabetes presenting with body a body mass index (BMI) >90% at a German university hospital system	A non-experimental observational study	Hemoglobin A1C is a more reliable screening test than oral glucose tolerance in asymptomatic patients with BMIs greater than 90%.	Level 6: Single descriptive design	There were a disproportionally higher numbers of patients with obesity versus overweight in the study group	This will not be used to support project due to low strength of study and need to determine screening in children with BMIs greater than 85%.

Francescatto, C., Santos, N., Coutinho, V., & Costa, R. (2014). Mothers' perceptions about the nutritional status of their overweight children: A systematic review. *Journal of Pediatrics, 90*(4), 332-343. doi: http://dx.doi.org/10.1016/j.jped.2014.01.009	To describe maternal perception of childhood nutritional status through a review of literature	Studies included were patients age 2-19 years old in several countries throughout the world where outcome measured was difference between child BMI and mother's perception of nutritional status	Non-experimental descriptive design	Mothers' of overweight or obese children predominantly underestimate their nutritional status. Factors for misperception include maternal overweight or obesity, educational level, and ethnicity	Level 5: Systematic review of descriptive studies	Studies use different methods of measuring maternal perception	Yes, will consider maternal perception of nutritional status for project
Javed, A., Jumean, M., Murad, M. Okorodudu, D., Kumar, S., Somers, V., Sochor, O., & Lopez-Jimenez, F. (2014). Diagnostic performance of body mass index to identify obesity as defined by body adiposity in children and	To determine the specificity and sensitivity of body mass index (BMI) as an indicator of childhood adiposity	Studies which met inclusion criteria included children of various ethnicities aged 2-18 years of age with BMI >85% and who had a comparative assessment of body composition.	A non-experimental descriptive correlational design	BMI has a high sensitivity but low specificity in identifying adiposity. Children with BMI less than 85% may have high adiposity that is under-identified.	Level 5: Systematic review of descriptive studies	There is heterogeneity of body composition methods	Yes, data may be included in literature review.

adolescents: a systematic review and meta-analysis. *Pediatric Obesity, 10*(3), 234-244. doi:10.1111/ijpo.242							
Kelishadi, R., Haghdoost, A. Moosazadeh, M., Keikha, M., & Aliramezany, M. (2015). A systematic review and meta-analysis on screening lipid disorders in the pediatric age group. *Journal of Research in Medical Sciences, 20*(12), 1191-1199.	To determine whether lipid screening targeted only at pediatric patients with family history of dyslipidemia identifies pediatric patients with high cholesterol through analysis of literature	In a systematic review, 19 studies met inclusion criteria. These studies consisted of over 34,000 pediatric patients aged 2-20 years who had parents with dyslipidemia or early cardiovascular disease	A non-experimental systematic review of cross-sectional studies	Consideration of parental history of premature CV disease or dyslipidemia in isolation of other CV risk factors are poor predictors of childhood dyslipidemia	Level 5: a systematic review of cross-sectional descriptive studies	Ethnicity of patients were not considered in the results	Yes, this supports using other factors besides family history when obtaining lipid levels
Perak, A., & Benuck, I. (2018). Preserving optimal cardiovascular health in children. *Pediatric*	To provide a cardiovascular (CV) health assessment scoring framework based on clinical recommendatio	Scoring framework to be utilized on patients under 18 years of age compiled from National Heart, Lung, and Blood Institute,	Non-experimental study based based on cumulative clinical guidelines	Cardiovascular health metric quantifies diet, physical activity, sleep, smoke exposure, body mass index, cholesterol, and	Health metric has not been validated as a reliable tool to categorize CV health	Level 7: expert opinion regarding interpretation of clinical guidelines	Yes, will integrate clinical guidelines for project health history templates

Annals, 47(12), e479-e486. doi: 10.3928/19382359-20181115-01	ns for cardiovascular health at the point of care	American Heart Association, American Diabetes Association, and the American Academy of Pediatrics		fasting glucose to determine measures of health to direct care			
Piercy, K., Troiano, R., Ballard, R., Carlson, S., Fulton, J., Galuska, D.,…Olson, R. (2018). The physical activity guidelines for Americans. *JAMA, 320*(19), 2020-2028. doi:10.1001/jama.2018.14854	To review evidence to determine recommendations on frequency, intensity, and duration of physical activity by age group	A systematic review of over 1200 evidence-based studies examining the relationship of physical activity on health in all age groups was conducted by an advisory team of physical activity experts	A non-experimental study and meta-analysis of evidence	Children aged 3-5 years should be active throughout the day, aged 6-17 should do moderate physical activity 60 or more minutes daily, adults should do 150-300 minutes of moderate to vigorous activity	The report does not provide a summary of the graded level of evidence for each recommendation	Level 1: clinical guidelines base on systematic reviews	Yes, these guidelines will be integrated into teaching templates
Prioreschi, A., Munthali, R., Kagura, J., Said-Mohamed, R., DeLucia Rolfe, E., Micklesfield, L., & Norris, S. (2018). The associations between adult body composition and	To determine early life predictors of adult body composition and adiposity	A cohort study consisting of 1,594 children without congenital anomalies born to single mothers in South Africa followed up until 22 years of age	A non-experimental correlational design	Rapid weight gain in childhood indicated by deviations in linear growth were positively associated with increased adiposity in adulthood	Birth length not documented in cohort	Level 4: a single cohort study	Yes, will linear growth patterns will be included in patient education

abdominal adiposity outcomes, and relative weight gain and linear growth from birth to age 22 in the birth to twenty plus cohort, South Africa. *PLoS One, 13*(1), 1-11. doi: 10.1371/journal.pone.0190483							
Rajo, T., Almasri, J., Nofal, A., Farah, W. Alsawas, M., Ahmed. A.,…Murad, H. (2017). The association of weight loss and cardiometabolic outcomes in obese children: Systematic review and meta-regression. *Journal of Clinical Endocrinology and Metabolism, 102*(3), 758-762. doi:10.1210/jc.2016-2575	To determine the impact of weight loss from obesity interventions (life-style modifications, medication, community-based interventions, or surgery) on cardiometabolic factors	A systematic review of studies with patients age 2-18 years old with BMI's greater than 85% who completed obesity interventions and reported metabolic measurements after 6 months of follow up	A non-experimental study and systematic review of RCTs and observational studies	Weight reduction is associated with significant changes in high density lipoprotein, systolic blood pressure and triglycerides	Level 5: Systematic review of descriptive studies	Studies may have been excluded from the systematic review if metabolic changes including weight and BMI were not recorded	Yes, focus on cardiometabolic factors versus strictly weight may benefit project structure

Shaikh, U., Berrong, J., Nettiksimmons, J., & Byrd, R. (2015). Impact of electronic health record clinical decision support on the management of pediatric obesity. *American Journal of Medical Quality, 30*(1), 72-80. doi: 10.1177/1062860613517926	To determine impacts of an electronic health record clinical decision support tool on clinician adherence to obesity diagnosis, laboratory screening, nutrition counseling, follow up, and referrals.	Medical record review of 584 pediatric patients with body mass index greater than 85% presenting for wellness exams at a University of California ambulatory clinic	A quasi-experimental design without random assignment to the treatment group (clinical decision support use) or control group	In the intervention group, clinician diagnosis of obesity increased by 17%, laboratory screening increased 10%, obesity follow up increased 18%, counseling increased by 3%.	Level 3: controlled trial without randomization	Poor clinician documentation may have falsely lowered process outcome measurements. There is also a small sample size.	Yes, the design for the clinical decision support will be considered when customizing templates
Shook, R., Halpin, K., Carlson, J., Davis, A., Dean, K., Papa, A., …Hampl, S. (2018). Adherence with multiple national healthy lifestyle recommendations in a large pediatric center electronic health record and reduced risk of obesity. *Mayo Clinic Proceedings,*	To determine the number of pediatric patients who meet healthy lifestyle recommendations and the association between lifestyle and obesity prevalence	Data included electronic health records with documented lifestyle assessments of over 24,000 pediatric patients ages 2-18 years of age in a Midwestern pediatric primary care clinic from 2013-2016.	Non-experimental observational study	Children who did not meet any healthy lifestyle recommendations where 1.7 times more likely to be obese than those meeting all five recommendations	Level 6: single descriptive	Potential bias in parents completing lifestyle assessments	No but reinforces need for lifestyle assessments

93(9), 1247-1255. doi: 10.1016/j.mayocp.2018.04.020							
Sim, L., Lebow, J., Wang, Z., Koball, A., & Murad, H. (2016). Brief primary care obesity interventions: A meta-analysis. *Pediatrics, 138*(4), 1-11. doi: 10.1542/peds.2016-0149	To determine impact of BMI surveillance and counseling interventions in the pediatric primary care setting on BMI	A review of 12 randomized controlled trials and quasi-experimental studies of patients aged 2-18 who underwent obesity interventions (such as lifestyle modifications) within the primary care setting	Systematic review of experimental studies both randomized and non-randomized	Patient-centered communication, education, and follow up visits and phone calls in the primary care setting have only marginal impacts on body mass index	Level 2: one or more randomized controlled trials	This study did not measure adverse effects from interventions such as patient perceptions of the intervention	Yes, this study supports the need for referral to comprehensive weight management programs
Styne, D., Arslania, S., Connor, E., Farooqi, I., Murad, M., Silverstein, J., & Yanovski, J. (2017). Pediatric obesity-assessment, treatment, and prevention: An endocrine society clinical	The purpose is to gather evidence and formulate a summary of recommendations for the assessment, diagnosis, treatment, and management of pediatric obesity.	Studies reviewed large samples of infants, children, and adolescents under different socioeconomic circumstance with lifestyle habits and compared serum metabolic	Systematic review and meta-analysis with strength of recommendation of randomized and non-randomized controlled trials, longitudinal,	The primary goal is obesity prevention due to challenge of treating obesity. Screening utilized BMI is recommended as is promotion of healthy diet and physical activity. If elevated BMI, comorbidities	Level 1: Clinical guidelines based on systematic review and meta-analyses	Does not indicate feasibility of integrating guidelines into clinical practice setting	Will use for project to direct provider education and protocol integration

practice guideline. *Journal of Clinical Endocrinology and Metabolism, 102*(3), 709-757. Doi:10.1210/jc.2016-2573		factors, BMI, and waist circumference	and cross-sectional studies	should be assessed including cholesterol and HgBA1C. Referral to endocrine or genetics are as indicated by physical exam and other lab values			
Thompson, N., Mansflield, B., Stringer, M., Stewart, B., Potter, J., & Fernengel, K. (2016). An evidence-based resource for the management of comorbidities associated with childhood overweight and obesity. *Journal of the American Association of Nurse Practitioners, 28*(10), 559-570. doi:10.1002/2327-6924.12369	To develop a comprehensive algorithm for management of childhood obesity and common comorbid health conditions through an integrative review of the highest level of evidence	Assessment and management of pediatric hypertension, sleep apnea, vitamin D deficiency, metabolic syndrome, dyslipidemia, and diabetes mellitus extracted from clinical guidelines highest level of evidence	Non-experimental study/review of clinical guidelines and expert opinion	Comprehensive algorithm to be used at point of care addressing all obesity comorbidities	Level 1: summary of clinical guidelines based on meta-analyses and systematic reviews	Comprehensive but due to nature of guidelines, expert opinion and consensus statements included	Yes, this will be helpful in electronic health record system design
Umer, A., Kelley, G.,	To identify the relationship	Longitudinal studies of	Non-experimental	Childhood obesity is	Level 5: Systematic	This study was not adjusted	Yes, this study will be used in

Cottrell, L.,Giacobbi, P., Innes, K., & Lilly, C. (2017). Childhood obesity and adult cardiovascular disease risk factors: a systematic review with meta-analysis. *BMC Public Health, 17*(683), 1-24. doi:10.1186/s12889-017-4691-z	between childhood obesity and adult cardiovascular risk factors	children at base age of 2-18 years of age in countries throughout the world identified as overweight, obese, or having body compositions showing adiposity with one or more adult outcome measures of cardiovascular risk	descriptive correlational study	strongly associated with adult systolic and diastolic blood pressures and triglycerides and inversely associated with high density lipoproteins	review of descriptive studies	for childhood obesity which was reversed in adulthood	literature review but will not be used for protocol integration
U.S. Department of Health and Human Services & National Heart, Lung, and Blood Institute. (2012). *Expert panel on integrated guidelines for cardiovascular health and risk reduction in children and adolescents.*	To determine strength of evidence and recommendations for identify risk CV risk factors in children and the development of atherosclerosis in adolescence and adulthood	Studies from 1985-2007 included 55 systematic reviews, 33 meta-analyses, 293 randomized controlled trials, 194 observational studies and 78 sets of CV-related guidelines	Non-experimental study	Integrated guidelines on recommendations for CV risk factor screening including family history, nutrition, physical activity, blood pressure, tobacco exposure, and lipids	Level 1: Clinical guidelines	Comprehensive recommendations with challenges to implementation during primary care encounter	Will utilize for scholarly project intervention
U.S. Department of Health and Human Services & U.S.	To outline healthy eating patterns and physical	A systematic review of food patterns and physical	Non-experimental systematic review and	A detailed description of healthy eating patterns and	Level 1: Clinical guidelines bases on	Details of specific evidence grading not	Yes, will use dietary and physical activity

Department of Agriculture. (2015). *2015-2020 dietary guidelines for Americans. 8th edition.* Retrieved from https://health.gov/dietaryguidelines/2015/guidelines/	activity levels to reduce the risk of disease	activity level in Americans from infancy to over 65 years of age	meta-analyses	activity levels by age and physical state provided	systematic reviews and meta-analyses	provides for each recommendation	guidelines for protocol creation

Appendix B

CITI Certificate

Completion Date 05-Jul-2019
Expiration Date 04-Jul-2022
Record ID 32291467

This is to certify that:

Mary LoGalbo

Has completed the following CITI Program course:

Biomedical Research - Basic/Refresher (Curriculum Group)
Biomedical & Health Science Researchers (Course Learner Group)
1 - Basic Course (Stage)

Under requirements set by:

Liberty University

Collaborative Institutional Training Initiative

Verify at www.citiprogram.org/verify/?w24f4a043-e703-4900-85af-7dc27282669b-32291467

Appendix C

Permission to Use Iowa Model

[redacted] - University of Iowa Hospitals and Clinics <noreply@qualtrics-survey.com>
Tue 7/16/2019 5:13 AM

- Logalbo, Mary

You have permission, as requested today, to review and/or reproduce *The Iowa Model Revised: Evidence-Based Practice to Promote Excellence in Health Care.* Click the link below to open.

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[redacted] with questions.

Appendix D

Letter of Site Support

[redacted]

August 21, 2019

To whom it may concern,

This is to inform you that Mary LoGalbo has been given site support to complete the scholarly project.

Please contact me if you have any further questions. My office phone number is [redacted]

Sincerely,

[redacted]

Appendix E

Cardiovascular Health Template

Cardiovascular health
Diet
Components: 1-Fruit/Vegetables 2-Fiber 3-Fish 4-Limited sugary beverages 5-Limited sodium Diet metric dropdownIdeal:4-5 componentsIntermediate:2-3 componentsPoor:0-1 components , ScoreIDEAL=2INT=1POOR=0 addt'l notes
Physical activity
Combination of adequate activity level and screen time limits per age group Activity & LeisureIdeal 3-5y:>2 hrs active play and < 1 hr screen timeIdeal >5yrs:> 1 hr moderate activity daily and < 2 hours screen timeIntermediate:Activity > 0 minutes but below ideal OR screen time > ideal limitsPoor:No appropriate activity level per age , ScoreIDEAL=2INT=1POOR=0 addt'l notes
Sleep
Total over 24 hours by age group Sleep Ideal 3-5yrs: 10-13 hoursIdeal 6-12 yrs: 9-12 hrsIdeal 13-18 yrs: 8-10 hrsIntermediate: 1 hr or less out of ideal rangePoor: >1 hr out of ideal range or other sleep disturbances , ScoreIDEAL=2INT=1POOR=0 addt'l notes
Smoke exposures
Smoking SmokeIdeal: never smoked AND no secondhand smoke exposureIntermediate: secondhand smoke exposure OR tried smokingPoor: smoking w/in past 30 days , ScoreIDEAL=2INT=1POOR=0 addt'l notes
Body Mass Index
BMI percentile ClassificationIdeal: <85%Intermediate: 85%-94%Poor: 95% or greater , ScoreIDEAL=2INT=1POOR=0 addt'l notes
Cholesterol
Lipid profile classifications RangesIdeal: TC<170, Non-HDL <120, LDL<110, TG<90Intermediate:TC<170-199, Non-HDL 120-144, LDL 110-129, TG 90-129Poor: TX >200, Non-HDL >145, LDL >130, TG>130 , ScoreIDEAL=2INT=1POOR=0 addt'l notes
Total CVH Score Percentile

%=Sum of scores/Total possible score	CVH % RangeIdeal: 100%High CVH: 75-100%Moderate CVH: 50-75%Low CVH: <50%	addt'l notes

Appendix F

University IRB Approval

[redacted] UNIVERSITY.
INSTITUTIONAL REVIEW BOARD

October 22, 2019

Mary LoGalbo
IRB Application 4038: Integration of a Pediatric Cardiovascular Health Model Within the Primary Care Setting

Dear Mary LoGalbo,

The [redacted] Institutional Review Board has reviewed your application in accordance with the Office for Human Research Protections (OHRP) and Food and Drug Administration (FDA) regulations and finds your study does not classify as human subjects research. This means you may begin your research with the data safeguarding methods mentioned in your IRB application.

Your study does not classify as human subjects research because evidence-based practice projects are considered quality improvement activities, which are not considered "research" according to 45 CFR 46.102(d).

Please note that this decision only applies to your current research application, and any changes to your protocol must be reported to the [redacted] IRB for verification of continued non-human subjects research status. You may report these changes by submitting a new application to the IRB and referencing the above IRB Application number.

If you have any questions about this determination or need assistance in identifying whether possible changes to your protocol would change your application's status, please email us at [redacted]