Program Title: A Collaborative Care Model for Perinatal Depression Support Services (COMPASS)

A. Award Category: Innovative Programs in Care

B. Program Objectives & Overview of Innovation

Perinatal depression, affecting one in seven women, is one of the most common pregnancy-related complications. Perinatal depression develops either during pregnancy or after delivery and can persist for years if left untreated. It significantly impairs functioning of the new mother, and can lead to both short and long term problems in her child. Prompt recognition and intervention reduces these complications, however the majority of women with depression do not receive adequate treatment. Barriers to care are myriad: obstetricians often report inadequate training in directly delivering mental health care while patients perceive stigma as well as logistical barriers to separate psychiatric appointments. Ultimately, less than one out of every ten women with perinatal depression will receive adequate mental health treatment.

COMPASS is a perinatal collaborative care model that re-imagines prenatal care delivery. In COMPASS, mental health care is seamlessly integrated into the prenatal clinic setting, fostering an environment of collaboration and care delivery for the whole woman. COMPASS uses a three-pronged approach including (1) the development and implementation of a perinatal depression educational training program for Northwestern obstetric providers, (2) a clinical care program including a perinatal psychiatrist and therapist to enable collaborative mental health care within the Northwestern Obstetric practices, and (3) an evaluation of the health utilization implications of this collaborative care model described in more detail in Appendix A. COMPASS promises to optimize perinatal mental health care across Northwestern but also to serve as a model for successful and sustainable implementation of perinatal collaborative care across academic medical centers around the country.

C. Program Details, Key Personnel, Timeline

The following individuals are essential to the COMPASS program and their roles described below. The clinical care flow in COMPASS is described in Appendix B.

1. Program Director (Emily S Miller, MD MPH): As the PD of the COMPASS program, Dr. Miller is responsible for program development, administrative oversight, development of the obstetric educational program, and data collection/analysis.
2. Care Coordinator (Rebekah Jensen, LCSW): Ms. Jensen is the lynchpin of the COMPASS system, responsible for the clinical intake into the program as well as the ongoing symptom surveillance and patient tracking. She orchestrates the discussion of the COMPASS weekly case review and facilitates communication between mental health and obstetric providers regarding individualized care plans.
3. Clinical Liaison (Jaqueline Gollan, PhD): Dr. Gollan clinically supervises the psychiatric care in addition to coordinating with Dr. Miller on the administrative oversight of the program to ensure sustainability.
4. Perinatal Psychiatrist(s): COMPASS remains committed to not just immediate care delivery, but also to training mental health providers who will go on to positively impact the lives of women across the country with their developing expertise in perinatal psychiatry. To that end, the Women's Mental Health Fellow(s) at Northwestern, supervised by faculty, perform the clinical consultations and management of women referred for COMPASS psychiatric care.
5. Therapist (Rachel Ostrov, LCSW): Ms. Ostrov, under the supervision of Dr. Gollan, provides evidenced-based psychotherapy to patients referred to COMPASS.

COMPASS opened its doors January 2017 and has grown steadily since with over 1100 referrals to date (Figure 1). Educational materials have been developed to support obstetric providers with screening and management of mild to moderate perinatal depression. Women referred to the program are evaluated by the care coordinator within 72 hours of referral by the obstetrician and a plan of care is initiated. The collaborative care model allows timely access to specialist assessment for those at highest risk; consultations with a perinatal psychiatrist are made within one week if they are needed. Evidence-based stepped care plans are discussed during our weekly multidisciplinary meeting (including obstetrics, perinatal psychiatry, perinatal psychology, and social work) that inform adjustments in care with the goal of all women referred achieving remission of their depressive symptoms. Women are followed in a registry to enable close follow-up of all women referred. Thus COMPASS provides exemplary mental health care across the entire Northwestern Medicine faculty practices.

D. Source of Initial and Sustained Funding/Support

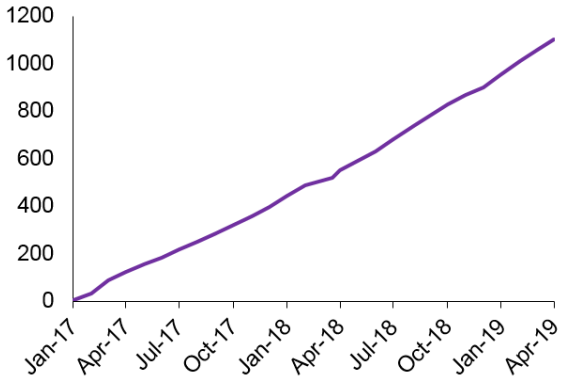
Start-up award from the Friends of Prentice Special Projects Program has funded the initial obstetrician education, implementation of clinical care programs, and development of a database to enable programmatic evaluation. The awarded budget was intended to fund initial three years of the program, but through modest revenue collection and good financial stewardship by the COMPASS team, these start-up funds have stretched for a projected 5-6 years of operation. In the meantime, we are actively working to become budget neutral through applying for additional innovation grants, the profit margin of billable psychotherapy, and exploration of new collaborative care billing codes (begun this calendar year in some of our state's commercial insurance plans). COMPASS thus not only aims to improve perinatal depression clinical outcomes but also to provide a roadmap to implementation of perinatal collaborative care systems across the United States.

E. Length of Time in Operation and Sustainability Plans

A central goal of COMPASS is sustainability. We are developing the administrative capacity to facilitate sustained access to clinical mental health services for obstetric patients receiving prenatal care at Northwestern Medicine. Future plans include the revenue streams described above as well as continually establishing ourselves as an invaluable service to both the psychiatry and obstetric departments.

F. Summary of Results and Evidence of Impact

Figure 1: COMPASS Referrals



There are approximately 4500 women per year that receive prenatal care in obstetric offices served by COMPASS. Since our clinical launch January 23 2017, we have had 1140 women referred to the COMPASS program (Figure 1), 818 (72%) of whom have enrolled in the COMPASS program to initiate mental health treatment. Initial diagnoses included 453 (55%) depression, 445 (54%) generalized anxiety, 47 (6%) bipolar, and 250 (30%) other. For initial treatment, 76% received psychotherapy (including 400 distinct patients seeing our therapists), 53% received pharmacotherapy, 39% received both psychotherapy and medication, and 9% declined any formal psychiatric treatment but were enrolled in an electronic symptom monitoring program. (Outcomes being tracked are outlined in Appendix A.) Importantly, while approximately 10% of the OBGYN population served by COMPASS receives Medicaid supported prenatal care, over 20% of women enrolled in COMPASS have Medicaid insurance. Thus, we anticipate that COMPASS not only improves clinical outcomes for all women, but also reduces disparities in mental health care experienced by this most vulnerable population.

G. Discussion of the Likelihood Others Could Replicate Your Program

A key goal of COMPASS is to develop and implement a program that can be replicated. To date, we have mentored 8 other medical centers since our inception over 2 years ago. These centers are actively initiating similar programs, using our advice and/or clinical algorithms. We also have a forthcoming publication ("Implementation of Perinatal Collaborative Care") written specifically to assist others in development and implementation of similar programs. We believe the screening and management algorithms created for COMPASS, the experience obtained to generate a collaborative care culture, and the administrative efforts developed to ensure the program can be financially sustainable are the essential components to enable replication of the COMPASS program across the United States.

H. Supporting Documents (optional)

a. Appendix A: Program Details
b. Appendix B: COMPASS Clinical Workflow
c. Appendix C: Obstetrician Educational Packet & Protocols

I. Contact Information

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Appendix A

Program Details

COMPASS programming began in September 2016 with a clinical launch in January 2017. Details regarding each of the aims of COMPASS are described below:

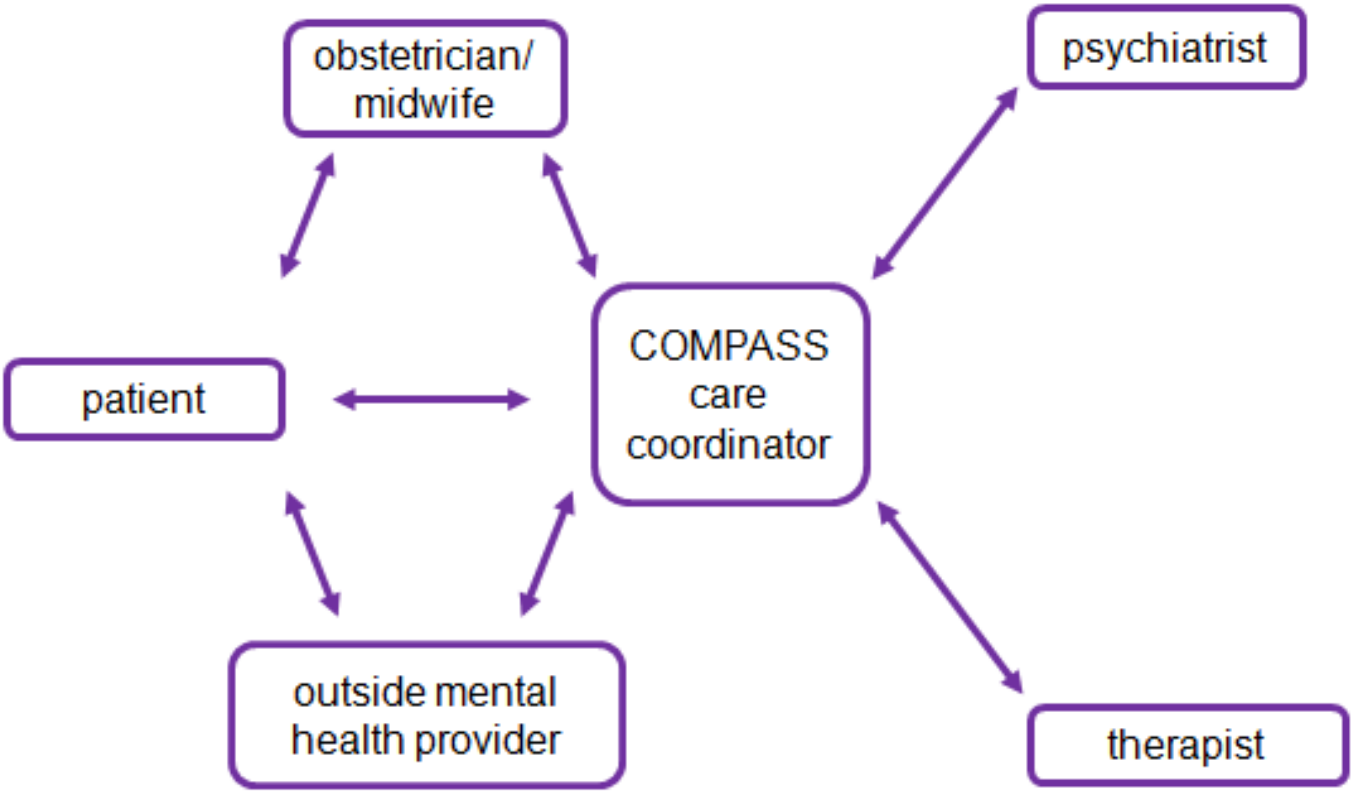
1. Obstetrician education: Prior to embedding a perinatal psychiatrist and therapist within the Northwestern prenatal clinics, we rolled out focused obstetrician training on perinatal mental health disorders. These trainings included recommended screening protocols, initial clinical evaluations, differential diagnoses, and general treatment algorithms. In addition, with experts in obstetric pharmacology, a medication in pregnancy resource guide (including dosing, common side effects, and drug-drug interactions specific to obstetric practice) was developed (Appendix C). Trainings have occurred as a part of the Department of Obstetrics and Gynecology Grand Rounds, Resident and Fellow Didactics, and Clinical Division Meetings for the various obstetrics groups. Patient and provider centered educational handouts were developed and disseminated. Repeated provider educational programs will be performed quarterly throughout the year and comprehensively at the beginning of each academic year to ensure sustained awareness.

2. Clinical care program: A critical aspect of COMPASS is the development of a collaborative care model. A central tenet of collaborative care is population-cased care with measurement-based target to treatment. To that end, we have implemented a patient registry with protocolized depression symptom surveillance by our care manager. Women who are not clinically improving are discussed at our weekly multi-disciplinary (including representation from obstetrics, psychiatry, psychology, and social work) team meeting. Systematic case reviews dictate the next steps in care escalation. In addition to adherence to core collaborative care principles, we have integrated a perinatal psychiatrist and therapist (LCSW) within the prenatal clinics in order to facilitate on-site access to mental health consultation for both patients and obstetric providers. Patients are able to schedule appointments at the time of their prenatal visit, minimizing the perceived stigma and logistical barriers to separate psychiatric appointments that obstruct treatment participation in traditional care models. Appendix B illustrates the clinical work flow of the COMPASS program.

3. Evaluation of health services implications and sustainability: The third-prong of the COMPASS program includes a critical assessment of its patient care and health system impact. The former will be evaluated by comparing adherence to state and national perinatal depression screening guidelines (at the first prenatal visit, in the third trimester, and postpartum) before and after implementation of COMPASS. In addition, mental health care treatment initiation and retention in mental health care for women diagnosed with a psychiatric illness will be compared before and after the COMPASS model.

In addition to patient-centered outcomes, health services utilization outcomes will be tracked. These will include obstetric health service utilization (inclusive of add-on obstetric visits outside of the standard prenatal visits, emergency room or triage evaluations, and missed prenatal care visits) as well as neonatal service utilization (inclusive of preterm births, small for gestational age births, NICU admissions and length of stay, neonatal treatment for maternal substance abuse, and initiation/continuation of breast feeding).

Appendix B: COMPASS Clinical Workflow



Appendix C: Obstetrician Educational Packet & Protocols

COMPASS

Antidepressant Medications

	Drug	Dosing Notes	Side Effects	Specific Drug Information
SSRI	Sertraline (Zoloft)	Prescribe 50 mg tabs Start: ½ tab for 2 days, if no side effects, increase to 50 mg/day Increase by 25-50 mg/day Q 2 weeks until remission unless side effects occur Range: 50-200mg/day	Common: nausea, diarrhea, headaches; sexual side effects common- anorgasmia, low desire –may improve over months Rare: Although SSRIs have been reported to increase bleeding risk, this has not been confirmed and is a rare event if the association exists. When using other drugs that affect bleeding risk, educate patient to monitor for bleeding as you usually would and adjust dose as needed	**First line in pregnancy and lactation** due to minimal risk for interaction with other drugs, tolerability and low risk of neonatal discontinuation signs in infants born to treated pregnant women
	Citalopram (Celexa)	Prescribe 20 mg tabs Start ½ tab for 2 days, if no side effects, increase to 20 mg QAM Range: 10-40 mg/day (20mg/day if hepatic impairment) Range: 20-40 mg/day		Citalopram and Escitalopram are not recommended for patients with congenital long QT syndrome, bradycardia, hypokalemia, or hypomagnesemia, recent acute myocardial infarction, or uncompensated heart failure. Citalopram should be used with monitoring of the EKG in patients who are taking other drugs that prolong the QT interval (erythromycin, hydroxychloroquine, quetiapine, olanzapine, methadone).
	Escitalopram (Lexapro)	Prescribe 10 mg tabs Start: ½ tab for 2 days, if no side effects increase to 10mg am Range: 10-20mg/day		
	Fluoxetine (Prozac)	Prescribe 20 mg capsules Start one cap Q AM and skip one day Take 20 mg QAM if no side effects; increase by 20 mg every 4 weeks until remission or until side effects occur Range: 20-60 mg /day		More activating than other SSRIs; long half-life reduces withdrawal risk Potent CYP 2D6 inhibitor; will increase the concentrations of other 2D6 substrates – *e.g*: metoprolol, metoclopramide, ondansetron, oxycodone; nortriptyline and amitriptyline. Decrease the initial dose of these drugs and assess effects or prescribe a different antidepressant.
	Paroxetine (Paxil)	Start: Prescribe 20 mg tabs Start: ½ tab for 2 days, if no side effects o 20mg/day; may be sedating and can be taken at HS Range: 20-60mg/day		**Second line drug**. Anticholinergic; weight gain; significant withdrawal syndrome and neonatal discontinuation signs for infants of treated pregnant women Potent CYP 2D6 inhibitor (see note under fluoxetine)
SNRI	Venlafaxine (Effexor)	Start: IR-37.5mg BID x 4 days then increase to 75 mg BID; ER-75mg QAM x 4 days then increase to 150 mg QAM Range 150-375mg/day	Same as SSRIs May increase BP and heart rate	**Second line drug**. More activation and GI side effects than SSRIs; significant withdrawal syndrome even with missed doses and neonatal discontinuation signs for infants of treated pregnant women
	Duloxetine (Cymbalta)	Start: 30mg qday x 4 days then increase to 60mg qday Range: 60-120mg/day		**Second line drug**, used more commonly in depression with chronic pain
Other	Mirtazapine (Remeron)	Start: 15mg qhs x 3-5 days then increase to 30mg qhs Range: 30-60mg/day	Sedating; increases appetite Long term weight gain	**Second line drug**. Sedating and appetite promoting; rarely associated with neutropenia An alternative drug for Hyperemesis gravidarum
	Bupropion (Wellbutrin)	Start: IR-100mg bid x 5 days then increase to 100mg tid; SR-150mg qam x 3-5 days then increase to 150mg bid; XL-150mg qam x 3-5 days then increase to 300mg qam Range: 300-450mg/day	Stimulating; may increase insomnia, anxiety initially May increase BP	**Second line drug**. Contraindicated in seizure disorder, eating disorders, alcohol use disorders, and history of traumatic brain injury because it decreases seizure threshold; stimulating; less effective for anxiety disorders Potent CYP 2D6 inhibitor; will increase in concentration for a few drugs commonly used by ob/gyns; see note under fluoxetine
Tricyclic	Nortriptyline (Pamelor)	Start 25 mg at HS for 4 days, then increase to 50 mg for 4 days, then to 75 mg Check plasma level after 7 days at 12 hours post-dose and adjust dose.		Therapeutic plasma level is 50-150; preferably 80-120 ng/ml. Dose to plasma level is linear; for example, if 100 mg dose yields level of 60 ng/ml, 150 mg will yield 1.5 (60) or 90 ng/ml. Cardiac toxicity with overdose.

Antidepressant Treatment Algorithm

Use **half** the recommended dose for **2 days**, then increase in specified increments **every 2 weeks** until patient achieves remission or has side effects*

sertraline (Zoloft)	fluoxetine (Prozac)	citalopram (Celexa)	escitalopram (Lexapro)
50-200 mg	20-60 mg	10-40 mg	5-20 mg
•Increase in 50 mg increments	•Increase in 10 mg increments	•Increase in 10 mg increments	•Increase in 5 mg increments

Reevaluate depression treatment every **2 weeks** via PHQ-9 and clinical assessment

If PHQ-9 remains ≥ 5…

- If no/minimal side effects → increase dose and/or add psychotherapy
- If side effects* → consider switching to different medication
- Consider contacting COMPASS Care Coordinator to facilitate psychiatry consultation

If PHQ-9 is < 5 and no/minimal side effects…

- Reevaluate every month and at postpartum visit

Educate Patient: Within first few doses, if she has marked increase in anxiety, becomes agitated, or feels energized, stop the medication and contact COMPASS.

*Common side effects of SSRI include: nausea, dry mouth, insomnia, diarrhea, headache, dizziness, agitation, sexual problems, and drowsiness

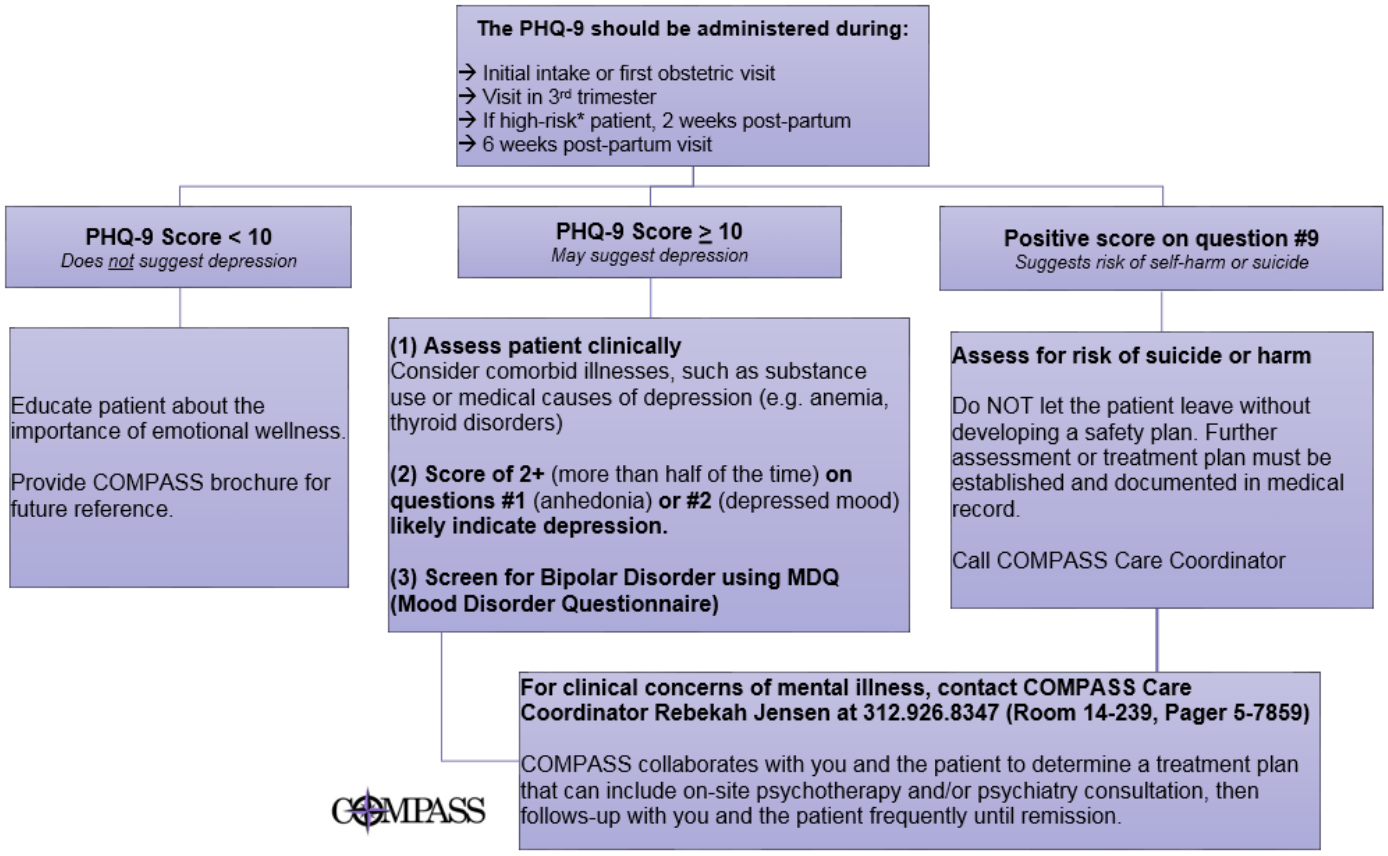
Version 5/30/2019

Discussion Points About Beginning Antidepressant Medication During Pregnancy

- **General Overview:**
  - No decision during pregnancy is risk free
  - SSRI (Selective Serotonin Reuptake Inhibitors) are among the best studied class of medications during pregnancy
  - Both medication and non-medication options should be considered
  - Encourage non-medication treatments (e.g., psychotherapy) in addition to medication treatment and/or as an alternative when clinically appropriate

Antidepressant use during pregnancy may increase risk of…	Risks of under-treatment or no treatment of depression during pregnancy…
Transient neonatal signs	Postpartum depression
Long-term developmental effects, but data are consistent that cognitive development is within normal limits	Pre-eclampsia
Recent well-controlled, large studies show that antidepressants do not increase the risk of birth defects	Pre-term labor
	Substance abuse
	Suicide
	Poor self-care
	Impaired bonding with baby
	Risk of mental health disorders in offspring
	Perinatal depression is associated with negative outcomes for mother, baby, and family

Depression Screening Algorithm for Obstetric Providers



(*) High-risk = history of depression or PHQ-9 score ≥ 10, those taking or who have taken psychiatric medications, or other risk factors for depression

Version 5/30/2019