

Data Supplement: The Need for Better and Broader Training in Cardio-Obstetrics—
A National Survey of Cardiologists, Cardiovascular Team Members, and Cardiology Fellows in
Training

Supplemental Data.

1. Survey questions for physicians and CV team members
2. Survey questions for Fellows in Training.

Supplemental Figure 1. Comfort level of cardiologists, FITs, and CV team members in the management of cardiovascular disorders in non-pregnant patients.

Supplemental Figure 2. Comfort level of cardiologists, FITs, and CV team members in the management of cardiovascular disorders in pregnant patients.

Supplemental Table 1. Demographic comparison between survey respondents and the American College of Cardiology membership at the time of survey distribution.

Supplemental Data.

1. Survey questions for cardiologists and CV team members

Welcome to the Cardio-Obstetrics Survey!

On behalf of the American College of Cardiology, thank you again for your participation in this important research. This study is a comprehensive effort to characterize those individuals involved in the care of women with and at risk for heart disease before, during, and after pregnancy. Goals are to characterize the backgrounds, practice patterns, training backgrounds and challenges of clinicians, and to define current institutional resources and processes. All answers will only be reported in aggregate with no individual or institutional information. This survey should take approximately 5-7 minutes to complete.

When you complete all of the questions be sure to select the "Submit" button. If you need to exit the survey before you are finished, please select the "Save" button. Your responses will be saved and you can resume taking the survey from the point at which you stopped.

Thank you very much for your time and insights.

1. To begin, do you currently practice medicine:

- Full-time (40 or more hours per week of clinical/administrative/research work)
- Part-time (39 or fewer hours per week of clinical/administrative/research work)
- Employed, but do not practice medicine (THANK AND TERMINATE)
- Retired (THANK AND TERMINATE)
- Other, please explain _____

2. How many years have you been in practice?

- In training
- 1-7 years
- 8-14 years
- 15-21 years
- More than 21 years

3. Who takes care of pregnant and postpartum women with heart disease at your institution?

- Whoever is called for the consult
- 1 or 2 cardiologists routinely take care of all of these women
- We have more than 2 cardiologists who routinely take care of these women

4. Does your facility have a dedicated cardio-obstetrics team and, if so, are you a part of that team?

- Yes – I am part of the team
- Yes – I am not part of the team
- No
- Not sure

4a. IF YES to 4, What individuals are on the cardio-obstetrics team at your facility? Please select all that apply.

- Ob/Gyn
- Maternal fetal medicine specialist
- Anesthesiologist
- Internal medicine/Family medicine/Med peds
- Cardiologist
- Social worker
- Care coordinator
- Advanced practice professional (NP, PA)
- Other, please specify: _____
- Not sure

4b. IF ANY CHOICE OTHER THAN “not sure” to 4a, At what point are the cardio-obstetrics team members involved in patient care? Select all that apply.

	INSERT INDIVIDUAL FROM Q4A	INSERT INDIVIDUAL FROM Q4A
Pre-pregnancy/Preconception	<input type="checkbox"/>	<input type="checkbox"/>
During pregnancy	<input type="checkbox"/>	<input type="checkbox"/>
Delivery planning	<input type="checkbox"/>	<input type="checkbox"/>
Delivery hospitalization	<input type="checkbox"/>	<input type="checkbox"/>
Post-discharge care	<input type="checkbox"/>	<input type="checkbox"/>
Not sure	<input type="checkbox"/>	<input type="checkbox"/>

5. How often do you take a reproductive history from a new female patient?

- Always
- Sometimes
- Never
- Depends, please describe: _____
- Not applicable
- Decline to answer

5a. IF ALWAYS/SOMETIMES, Which of the following conditions do you investigate? Please select all that apply.

- Gestational hypertension
- Preeclampsia/Eclampsia
- Gestational diabetes
- Preterm birth
- Small for gestational age
- Polycystic ovary syndrome
- History of assisted reproductive technology/in vitro fertilization
- Age of first menses
- Contraceptive methods used
- Age of menopause
- History or current use of hormone replacement therapy
- Other, please describe:
- None

6. How often do you evaluate a pregnant or lactating patient with a need for cardiovascular assessment or treatment?

- Daily
- Weekly
- Monthly
- Every 3-6 months
- Annually
- Never

6a. IF DAILY/WEEKLY/MONTHLY/EVERY 3-6 MONTHS, what are the 3 most common reasons you are asked to evaluate these women? CHOOSE 3 and rank order

- Hypertension
- Preeclampsia
- Valvular heart disease
- Heart failure
- Pulmonary hypertension
- Arrhythmia history or management
- Complex congenital heart disease

- Simple congenital heart disease (ASD/PFO, etc.)
- ACS/CAD
- Connective tissue disorder (Marfans, Ehlers-Danlos, etc.)

7. How confident do you feel in the following:

	Not at all confident 1	2	3	4	Extremely confident 5	NA
Managing cardiovascular disease in a pregnant patient						
Prescribing a cardiology-related medication to a pregnant patient						
Prescribing a cardiology-related medication to a lactating patient						

8. How comfortable do you feel managing the following areas:

	Not at all comfortable 1	2	3	4	Extremely comfortable 5	NA
Physical examination and physiologic changes of the cardiovascular system during pregnancy						
Hypertension management during pregnancy						
Valvular disease in pregnancy						
Management of arrhythmias during pregnancy						
Simple congenital heart disease						
Complex congenital heart disease						
Acute coronary syndromes during pregnancy						
Chronic coronary artery diseases during pregnancy						
Management of aortopathies during pregnancy and delivery						
Management of prosthetic valves and anticoagulation in pregnancy						
Recommending contraception to women with CVD						
Medication safety in lactation and pregnancy						
Multimodality imaging in pregnancy						
Peripartum cardiomyopathy						
Cardiovascular considerations for mode of delivery						
Pre-pregnancy risk assessment and preconceptual counseling						

9. During your training, did you have formal didactic sessions on topics within cardio-obstetrics?

- Yes
- No
- Not sure

10. Which of the following best describes your clinical exposure to pregnant women with cardiovascular disease during your training?

- Adequate training

- Limited/inadequate training
- No exposure
- Other, please specify: _____

11. How much dedicated training (clinical and didactic learning) on cardio-obstetrics did you have during training?

- Less than 1 month
- 1-3 months
- 4-6 months
- 7-12 months
- More than 12 months
- No formal training

12. How important is it for cardio-obstetrics to be part of the ACC catalog of learning options?

Not at all important 1	2	3	4	Extremely important 5	Not sure
○	○	○	○	○	○

13. The ACC is considering offering additional educational content on cardio-obstetrics. Which format do you prefer? please select all that apply.

- Webinar series
- Dedicated stand alone in-person specialty conferences
- Separate educational track at ACC Scientific Sessions
- Online CME modules
- ACC SAP
- ACC Chapter meetings
- Other, please specify: _____
- None

14. How likely are you to participate in ACC educational offerings on cardio-obstetrics?

Not at all likely 1	2	3	4	Extremely likely 5	Not sure
○	○	○	○	○	○

And now for a few final questions for demographic purposes only.

15. Which of the following best describes your primary work setting?

- Cardiovascular Group
- Government Hospital or Agency-Military
- Government Hospital or Agency-Veterans Affairs
- Government Hospital or Agency-Other
- Insurance Company (HMO, PPO, IPA)
- Industry (pharma, device)
- Multi-Specialty Group
- Medical School/University
- Non-governmental Hospital
- Solo practice
- Other, please specify _____

16. What is the ownership structure of your practice? (answer required)

- Physician owned
- Hospital owned
- Government owned
- Insurance company owned
- Medical school/University owned
- Other, please specify _____
- Not sure

17. What is your gender?

- Male
- Female
- Non-binary
- Other, please specify: _____
- Decline to provide

18. Which category describes your race/ethnicity? Please select all that apply.

- Asian
- Black/African American
- Hispanic
- Native American/Alaskan Native
- Native Hawaiian/Other Pacific Islander
- White
- Other, please specify: _____
- Decline to provide

19. Please share any comments you may have about the topics covered in this survey.

20. Would you like to be entered into our random drawing to win one of four \$150 Amazon Gift Cards?

- Yes
- No

[IF Q.20="YES", PLEASE ASK Q.20A]

20A Please enter your contact information below so that you can be notified if you are one of our winners.

Name _____
Email _____

Thank you so much for your time and insights!

2. Survey questions for Fellows in Training.

Welcome to the Cardio-Obstetrics Survey!

On behalf of the American College of Cardiology, thank you again for your participation in this important research. This study is a comprehensive effort to characterize those individuals involved in the care of women with and at risk for heart disease before, during, and after pregnancy. Goals are to characterize the current level of cardio-obstetrics training experienced and challenges encountered during fellowsip, and to define current institutional resources and processes. All answers will only be reported in aggregate with no individual or institutional information. This survey should take approximately 2-5 minutes to complete.

When you complete all of the questions be sure to select the "Submit" button.
If you need to exit the survey before you are finished, please select the "Save" button. Your responses will be saved and you can resume taking the survey from the point at which you stopped.

Thank you very much for your time and insights.

1. To begin, in which year of training are you currently in?
 - 1st year clinical cardiology fellow
 - 2nd year clinical cardiology fellow
 - 3rd year clinical cardiology fellow
 - 1st year research fellow
 - 2nd year research fellow
 - Other, please describe: _____

2. What is the primary setting for your training program?
 - University hospital
 - Community hospital
 - Private practice
 - Other, please specify: _____

3. What is your planned area of specialization?
 - General Cardiology
 - Imaging
 - Heart Failure
 - Electrophysiology
 - Invasive/Interventional
 - Adult Congenital
 - Critical Care
 - Undecided
 - Other (please specify)

4. How many cardiology fellows (clinical and research) are there in your program in total (throughout all years)?
 - 1-10
 - 11-20
 - 21-30
 - 31-40
 - 41-50
 - More than 50
 - Not sure

5. How often do you take a reproductive history from a new female patient?
 - Always
 - Sometimes

- Never
- Depends, please describe: _____
- Not applicable
- Decline to answer

5a. IF ALWAYS/SOMETIMES, Which of the following conditions do you investigate? Please select all that apply.

- Gestational hypertension
- Preeclampsia/Eclampsia
- Gestational diabetes
- Preterm birth
- Small for gestational age
- Polycystic ovary syndrome
- History of assisted reproductive technology/in vitro fertilization
- Age of first menses
- Contraceptive methods used
- Age of menopause
- History or current use of hormone replacement therapy
- Other, please describe:
- None

6. How often do you evaluate a pregnant or lactating patient with a need for cardiovascular assessment or treatment?

- Daily
- Weekly
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- Annually
- Never

7. How confident do you feel in the following:

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Chronic coronary artery disease during pregnancy						
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Management of prosthetic valves and anticoagulation in pregnancy						
Recommending contraception to women with CVD						
Medication safety in lactation and pregnancy						
Multimodality imaging in pregnancy						
Peripartum cardiomyopathy						
Cardiovascular considerations for mode of delivery						
Pre-pregnancy risk assessment and preconception counseling						

9. What is the primary source of information to which you refer for cardio-obstetrics questions?

- UpToDate
- ACC/AHA Guidelines
- JACC
- Online search
- Attendings at your institution
- Other, please specify: _____

10. Does your program have a specialized cardio-obstetrics training module?

- Yes
- No
- Not sure

10a. IF YES: Do you rotate through cardio-obstetrics clinic as a fellow?

- Yes, it is mandatory
- Yes, only as an elective
- No

11. In this past year (July 2019 through current date), did you have a lecture/conference/CME (any form of didactic) on cardio-obstetrics in your program?

- Yes
- No
- Not sure

11a. IF YES, how many total hours were dedicated to cardio-obstetrics for the year?

- 1-5 hours
- 6-10 hours
- More than 10 hours

12. How important is it for cardio-obstetrics to be included in COCATS requirements?

Not at all important 1	2	3	4	Extremely important 5	Not sure
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

13. The ACC is considering offering additional educational content on cardio-obstetrics. Which format do you most prefer? please select all that apply.

- Webinar series
- Dedicated stand alone in-person specialty conferences
- Separate educational track at ACC Scientific Sessions
- Online CME modules
- ACC SAP
- ACC Chapter meetings
- Other, please specify: _____
- None

14. How likely are you to participate in ACC educational offerings on cardio-obstetrics?

Not at all likely 1	2	3	4	Extremely likely 5	Not sure
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

15. What is your gender?

- Male
- Female
- Non-binary
- Other, please specify: _____
- Decline to provide

16. Which category describes your race/ethnicity? Please select all that apply.

- Asian
- Black/African American
- Hispanic
- Native American/Alaskan Native
- Native Hawaiian/Other Pacific Islander
- White
- Other, please specify: _____
- Decline to provide

17. Please share any comments you may have about the topics covered in this survey.

18. Would you like to be entered into our random drawing to win one of four \$150 Amazon Gift Cards?

- Yes
- No

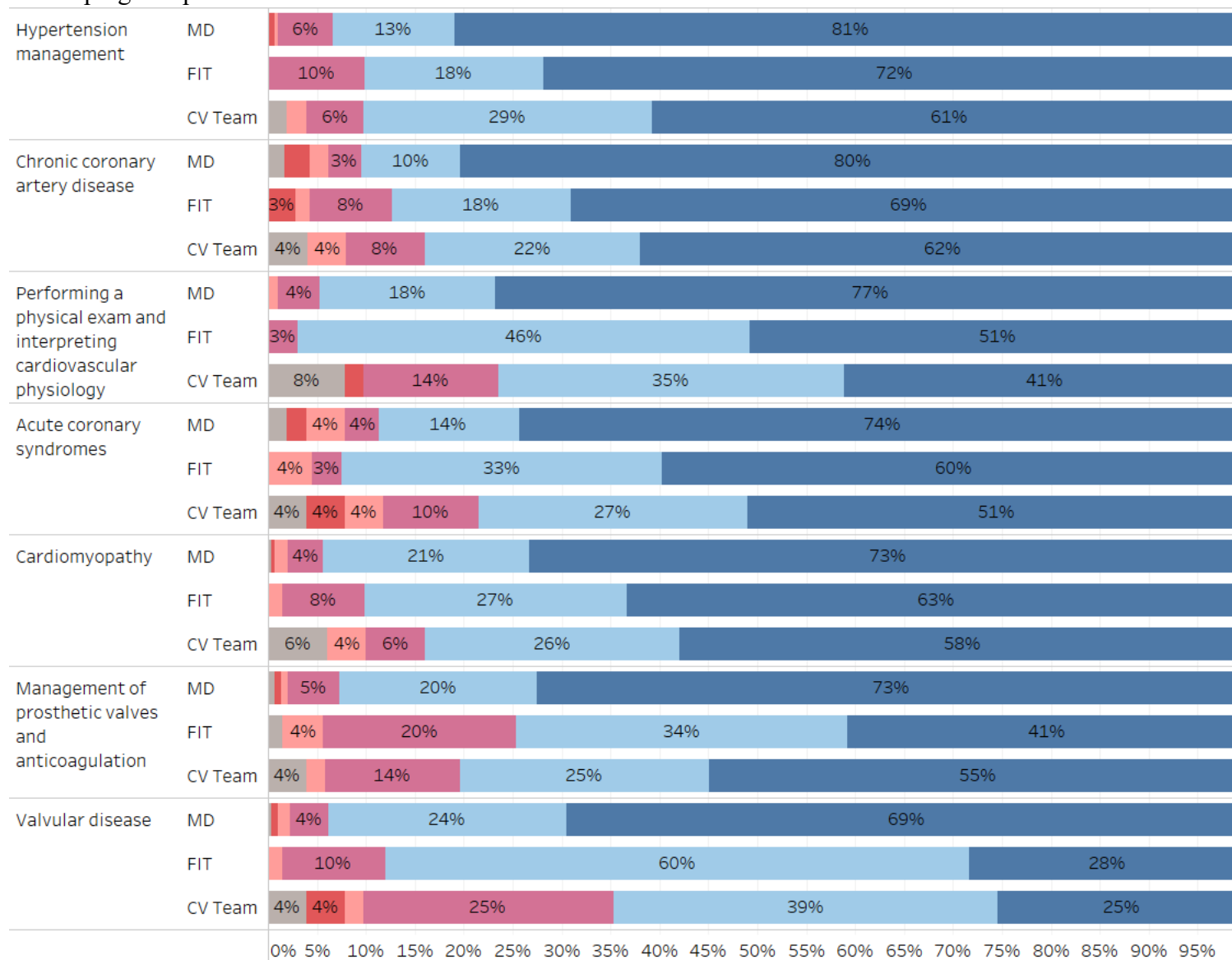
[IF Q.18="YES", PLEASE ASK Q.18A]

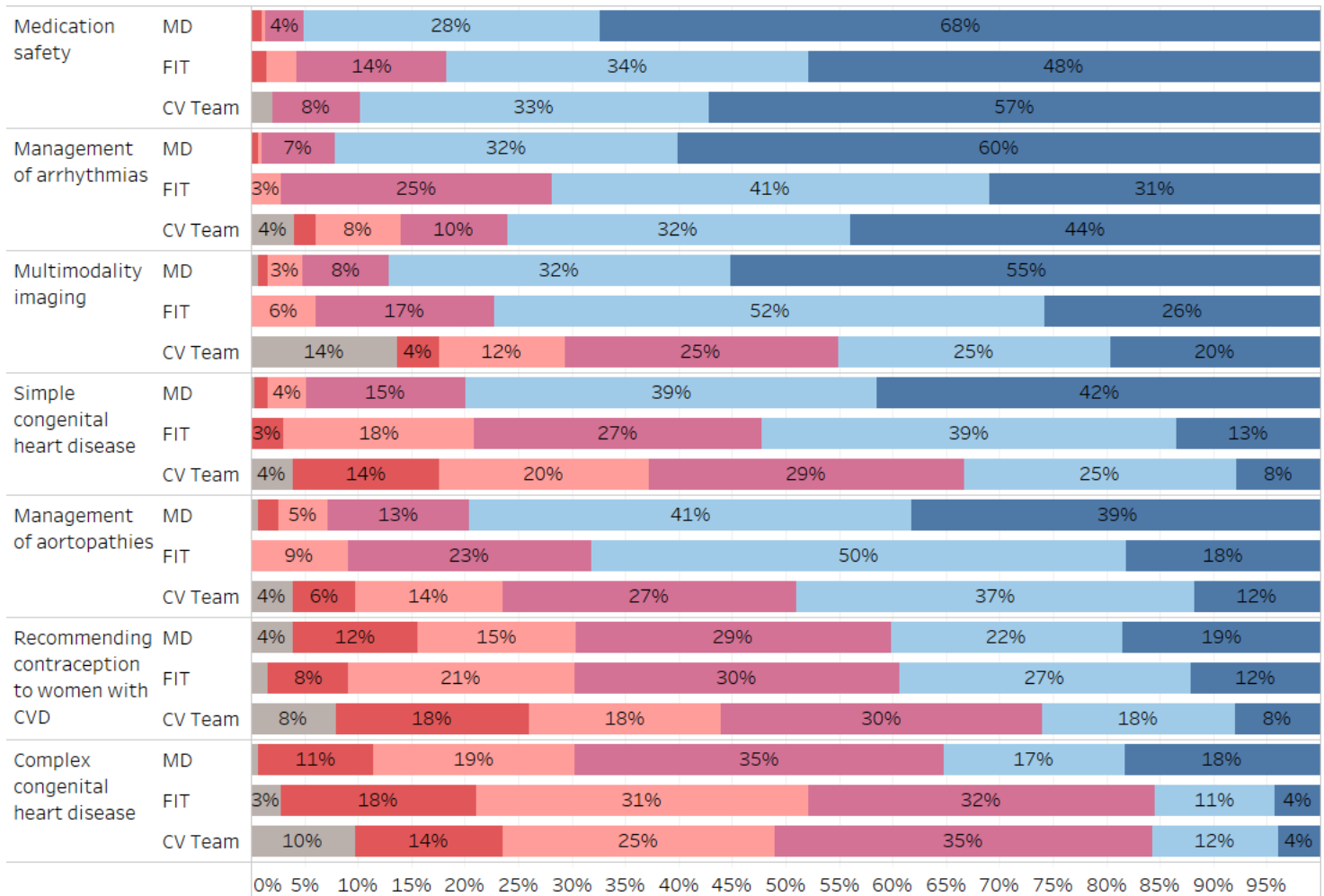
18A Please enter your contact information below so that you can be notified if you are one of our winners.

Name _____
 Email _____

Thank you so much for your time and insights!

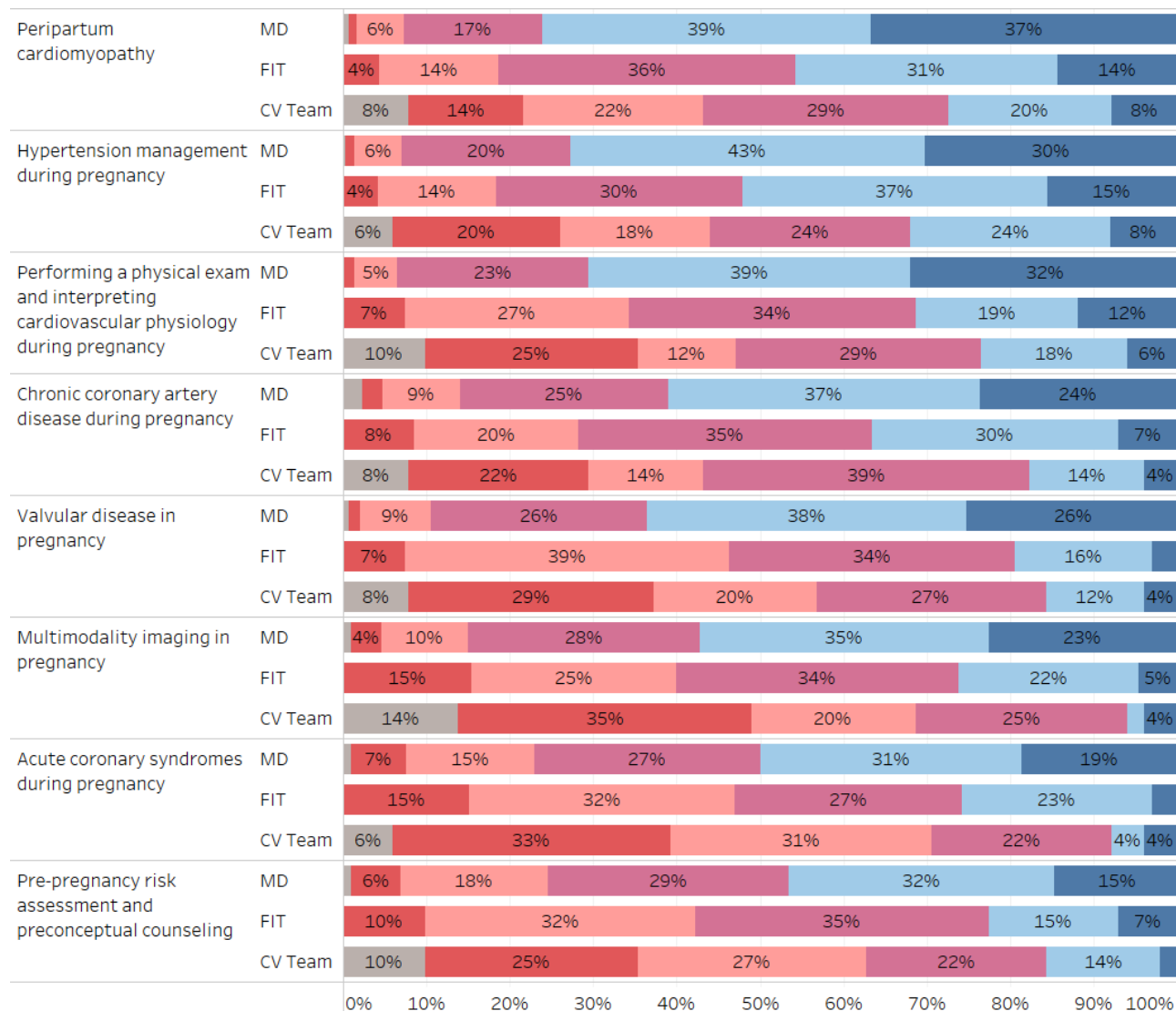
Supplemental Figure 1. Comfort level of cardiologists, FITs, and CV team members in the management of cardiovascular disorders in non-pregnant patients.

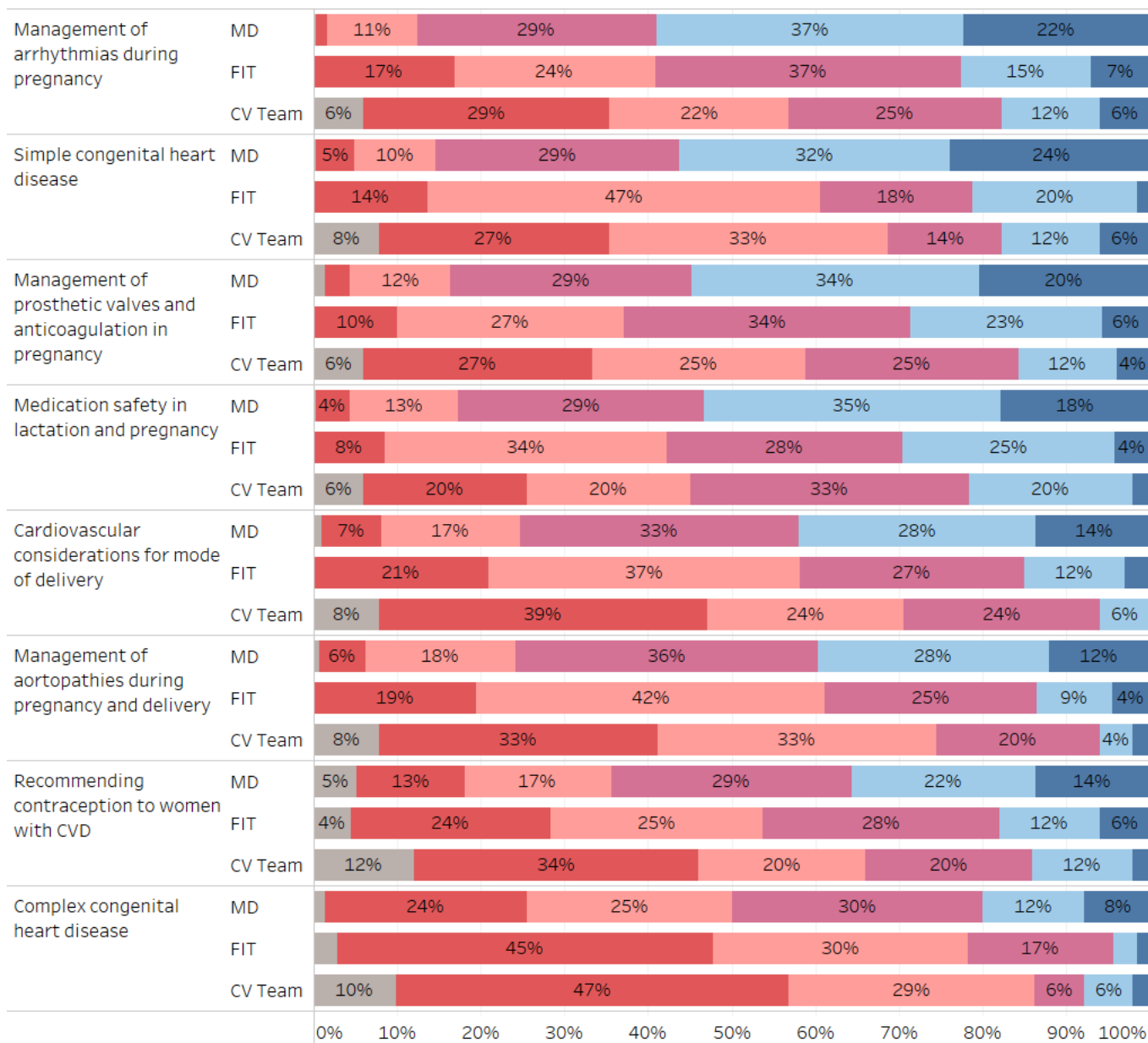




CV= cardiovascular, FIT = fellow in training, MD = cardiologist

Supplemental Figure 2. Comfort level of cardiologists, FITs, and CV team members in the management of cardiovascular disorders in pregnant patients.





CV= cardiovascular, FIT = fellow in training, MD = cardiologist



Supplemental Table 1. Demographic comparison between survey respondents and the American College of Cardiology membership at the time of survey distribution.

	Physician		Cardiovascular Team Member		Fellow-in-Training	
	Survey Respondents	ACC Members	Survey Respondents	ACC Members	Survey Respondents	ACC Members
<i>Self-reported Gender</i>						
<i>Unknown</i>	3.8%	9.2%	2.0%	2.8%	13.7%	18.0%
<i>Decline</i>	0.0%	0.1%	0.0%	0.4%	1.0%	0.2%
<i>Female</i>	25.6%	13.8%	84.3%	81.9%	27.5%	21.3%
<i>Male</i>	70.6%	76.9%	13.7%	14.9%	57.8%	60.4%
<i>Other</i>	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%
<i>Age (5-year intervals)</i>						
<i>30 or younger</i>	0.0%	0.1%	9.8%	9.9%	10.8%	14.9%
<i>31-35</i>	10.2%	7.9%	21.6%	16.7%	72.5%	66.1%
<i>36-40</i>	13.4%	12.9%	17.6%	15.0%	11.8%	11.5%
<i>41-45</i>	11.9%	11.1%	13.7%	12.1%	3.9%	3.3%
<i>46-50</i>	11.0%	10.7%	3.9%	12.0%	0.0%	0.7%
<i>51-55</i>	11.3%	10.2%	13.7%	9.2%	0.0%	0.1%
<i>56-60</i>	14.5%	12.6%	7.8%	9.8%	0.0%	0.1%
<i>61-65</i>	12.8%	12.6%	5.9%	7.5%	0.0%	0.0%
<i>66-70</i>	6.1%	10.0%	2.0%	3.2%	0.0%	0.5%
<i>71+</i>	5.8%	7.4%	0.0%	0.7%	0.0%	0.0%
<i>N/A</i>	2.9%	4.6%	3.9%	3.7%	1.0%	2.8%
<i>Self-Reported Race/Ethnicity</i>						
<i>Unknown</i>	39.5%	54.9%	23.5%	28.3%	57.8%	73.3%

<i>Asian</i>	14.2%	12.0%	9.8%	5.2%	10.8%	10.1%
<i>Black/African American</i>	2.3%	1.8%	2.0%	2.6%	3.9%	1.5%
<i>Decline To Provide</i>	1.7%	1.0%	0.0%	1.3%	2.0%	0.9%
<i>Hispanic/Latin</i>	5.2%	3.1%	5.9%	2.7%	5.9%	2.8%
<i>Native American/Alaskan Native</i>	0.0%	0.1%	0.0%	0.3%	0.0%	0.0%
<i>Hawaiian/Other Pacific Islander</i>	0.3%	0.1%	2.0%	0.4%	0.0%	0.0%
<i>Other</i>	4.4%	3.2%	2.0%	1.5%	4.9%	2.8%
<i>White</i>	32.3%	23.9%	54.9%	57.7%	14.7%	8.5%
Region						
<i>East North Central</i>	14.5%	14.9%	9.8%	20.1%	19.6%	17.2%
<i>East South Central</i>	6.7%	5.6%	5.9%	5.6%	5.9%	4.7%
<i>Middle Atlantic</i>	16.0%	18.3%	19.6%	12.3%	18.6%	21.8%
<i>Mountain</i>	2.6%	5.5%	7.8%	7.0%	3.9%	3.5%
<i>New England</i>	9.3%	6.6%	7.8%	6.9%	7.8%	8.9%
<i>Pacific</i>	10.8%	11.9%	5.9%	10.9%	6.9%	9.4%
<i>South Atlantic</i>	22.7%	20.3%	23.5%	21.4%	18.6%	17.4%
<i>West North Central</i>	6.4%	6.5%	7.8%	8.7%	8.8%	7.4%
<i>West South Central</i>	10.2%	9.9%	11.8%	6.8%	7.8%	8.8%
<i>Other - PR/GU/VI</i>	0.9%	0.5%	0.0%	0.2%	2.0%	0.8%
Board Certification						
<i>Adult Congenital</i>	3.2%	1.0%				
<i>Adult Cardiology</i>	82.6%	84.6%				

<i>Electrophysiology</i>	7.6%	7.5%
<i>Heart Failure/Transplant</i>	4.9%	3.5%
<i>Interventional Cardiology</i>	22.4%	25.8%
<i>Nuclear Medicine</i>	2.9%	2.8%
<i>Surgery</i>	0.3%	1.8%
<i>Pediatric Cardiology</i>	5.8%	3.8%

CVT= cardiovascular team member, FIT = fellow in training