Appendix: CARDIAC Data Collection Form

CASE RECORD FORM

SECTION 1: COMPLETED (ONCE) ONLY UPON SUB-STUDY ENROLMENT

1.1 COVID-19 CRITICAL CARE CONSORTIUM OBSERVATIONAL STUDY PATIENT IDENTIFICATION NUMBER:_______________

1.2 PREVIOUS DIAGNOSIS OF CHRONIC CARDIAC DISORDERS:

1.2.A. Ischemic Heart Disease (IHD)
   • YES  • NO  • N/A
   If yes, select all that apply:
   • PCI (Percutaneous Coronary Intervention)
   • CABG (Coronary Artery Bypass Grafts)
   • Medical Management only

1.2.B. Known Angina
   • YES  • NO  • N/A
   If yes - grade as per Canadian Cardiac Society (CCS) staging criteria:
   • CCS I
   • CCS II
   • CCS III
   • CCS III

1.2.C. Known CHF (Congestive Heart Failure)
   • YES  • NO  • N/A
   If yes - grade as per New York Heart Association (NYHA) class system:
   • NYHA I
   • NYHA II
   • NYHA III
   • NYHA IV
1.2.D. Known arrhythmia

- YES
- NO
- N/A

If yes (select all that apply):

- Atrial fibrillation (AF)
- Atrial flutter (AFL)
- Supra-ventricular tachycardia (SVT)
- Sick sinus syndrome (SSS)
- Second-degree Mobitz II AV block or Third-degree AV block
- Sustained VT (>10 beats)
- Ventricular fibrillation (VF)
- Torsades de Pointe

1.2.E. Previously Implanted Cardiac Device:

- YES
- NO
- N/A

If yes (select all that apply):

- Permanent Pacemaker (PPM)
- Implanted Cardiac Defibrillator (ICD)
- Cardiac resynchronisation therapy (CRT)

1.2.F. Previous Cardiac transplant

- YES
- NO
- N/A

1.2.G. Mechanical circulatory support device in situ at time of being hospitalised (ie. Left ventricular assist device (LVAD))

- YES
- NO
- N/A

1.2.H. Congenital heart disease

- YES
- NO
- N/A

1.2.I. Pre-existing Cardiomyopathy:

- YES
- NO
- N/A

If YES, specify from list provided (select all that apply)

- Dilated Cardiomyopathy (DCM): Familial
- Dilated Cardiomyopathy (DCM): Idiopathic
- Hypertrophic Cardiomyopathy (HCM)
- Ischemic Cardiomyopathy (ICM)
- Peripartum Cardiomyopathy (PPCM)
- Infiltrative Cardiomyopathy (Hemochromatosis, Sarcoidosis, Amyloidosis)
- Arrhythmogenic right ventricular Cardiomyopathy (ARVC)
- Metabolic Cardiomyopathy (Fabry’s)
- Post-infectious cardiomyopathy (Chagas)
- Others

1.2.J. Presence of Prosthetic valve

- YES  •  NO  •  N/A

a) If YES, specify the location of prosthetic valve (Tick all that apply)
   - Aorta
   - Tricuspid
   - Mitral
   - Pulmonary

b) If YES, specify the type of Prosthetic valve
   - Mechanical
   - Bioprosthetic

1.3 HAS THE PATIENT BEEN DIAGNOSED WITH AN ACUTE CORONARY SYNDROME IN THE LAST 6 MONTHS?

- YES  •  NO  •  N/A
SECTION 2: COMPLETED (ONCE) AT END OF ICU ADMISSION

2. CARDIAC COMPLICATIONS DURING THIS ILLNESS EPISODE

2.1a Acute Myocardial Infarction Occurring during admission for COVID-19

- YES  - NO  - N/A

If YES (specify): select 1 from the following
- ST-elevated myocardial infarction (STEMI)
- Non-ST-elevated myocardial infarction (NSTEMI)

If YES selected:
Diagnosis supported with angiography?
- YES  - NO  - N/A

specify (select all that apply)
- Transcatheter angiography
- CT coronary angiography (CTCA)

2.1b DATE OF DIAGNOSIS OF Acute Myocardial Infarction:

Date: __/__/____ (D/M/Y)

2.1c Intervention for Acute myocardial infarction

- YES  - NO  - N/A

If YES: (Select all that apply)
- Percutaneous coronary intervention (PCI)
- CABG (surgical coronary artery grafting)
- Thrombolytic
- Antiplatelet Therapy
- Heparin infusion

2.2a DIAGNOSIS OF CLINICALLY SUSPECTED MYOCARDITIS
Details

If Yes → Echocardiographic diagnosis
• YES         • NO         • N/A
(If YES, PLEASE COMPLETE ECHO DATA IN SECTION 4.1)

If no→ Alternative imaging used to aid in diagnosis
• YES         • NO         • N/A

If YES, (Select all that apply)
• Cardiac MRI
• Myocardial perfusion scintigraphy
• CT coronary angiogram (CTCA)

Biopsy performed
• YES         • NO         • N/A

If YES, SARS-CoV2 detected on Biopsy sample?
• YES         • NO         • N/A

Biomarkers - Please complete in Section 5
YES           NO           N/A

If YES, please choose the parameter above the normal range.

• Troponin I
• Troponin T
• High sensitivity troponin I (Hs-TnI)
• High sensitivity troponin T (Hs-TnT)

2.2b DATE OF DIAGNOSIS OF MYOCARDITIS (only if ‘yes’ to 2.2):
Date: __/__/_____

2.2c DIAGNOSIS OF TAKOTSUBO CARDIOMYOPATHY:
• YES         • NO         • N/A
(If ECHO PERFORMED PLEASE COMPLETE ECHO DATA IN SECTION 4.1)
2.2d DATE OF DIAGNOSIS OF TAKOTSUBO CARDIOMYOPATHY (only if ‘yes’ to 2.2c):
Date: __/__/____

2.3a NEW ONSET OF CARDIAC ARRHYTHMIA REQUIRING TREATMENT

- YES
- NO
- N/A

If YES, (Select all that apply)

1. Atrial fibrillation (AF)
2. Atrial flutter (AFL)
3. Supra-ventricular tachycardia (SVT)
4. Sick sinus syndrome (SSS)
5. Second-degree Mobitz II AV block or Third-degree AV block
6. Sustained VT (>10 beats)
7. Ventricular fibrillation (VF)
8. Torsades de Pointe

2.3b DATE OF ONSET NEW CARDIAC ARRHYTHMIA (only if ‘yes’ to 2.3):
Date: __/__/____ (D/M/Y)

2.3c MANAGEMENT OF ARRHYTHMIA (circle all that apply)

- Pharmacological
- Direct current (DC) cardioversion
- Pacemaker insertion: temporary
- Pacemaker insertion: permanent
- Implantable cardioverter-defibrillator (ICD)
- Mechanical circulatory support (MCS) (if yes, complete details in section 3.1b)
- None
- Not Available

2.4a CARDIAC ARREST(S) DURING THIS EPISODE OF ILLNESS:

- YES
- NO
- N/A

2.4b NUMBER OF CARDIAC ARRESTS DURING THIS EPISODE OF ILLNESS:

________________________________________
2.4c DATE OF FIRST CARDIAC ARREST (only if ‘yes’ to 2.4):
Date: __/__/____ (MM/DD/YY)

2.4d LOCATION OF CARDIAC ARREST(S) DURING THIS EPISODE OF ILLNESS (only if ‘yes’ to 2.4a): multiple selections

- Out of Hospital Cardiac Arrest (OHCA)
- Emergency Department (ED)
- Intensive Care Unit (ICU)
- General Ward or other medical area

2.5a Sustained Return of Spontaneous Circulation (ROSC) of at least 20 minutes (only if ‘yes’ to 2.4a):

- YES  
- NO  
- N/A

If Yes, longest duration of resuscitation to achieve sustained ROSC: __________ (minutes)

2.5b POST-ROSC MANAGEMENT (only if ‘yes’ to 2.5a):

Post-arrest hypothermia

- YES  
- NO  
- N/A

Mechanical Circulatory Support including VA-ECMO (commenced post-ROSC)

- YES  
- NO  
- N/A

2.5c NEUROIMAGING PERFORMED POST ROSC?

- YES  
- NO  
- N/A

Major CNS abnormality reported by radiologist:

- YES  
- NO  
- N/A

2.5d Post-Arrest Neurologic Score (At time of hospital discharge)

Cerebral performance category (CPC) score

- CPC 1
- CPC 2
- CPC 3
- CPC 4
- CPC 5
2.6 DIAGNOSIS OF OTHER CARDIAC COMPLICATIONS: select from the list

- Pericardial Tamponade
- Intracardiac thrombus
- Ischemic complication (i.e. Ischemic Ventricular septal defect/perforation, Papillary Muscle Rupture, LV aneurysm, LV Pseudoaneurysm, LV/RV free wall rupture)

2.7 DIAGNOSIS OF CARDIOGENIC SHOCK DURING ICU STAY:

- YES  
- NO  
- N/A  

2.8 MECHANICAL CIRCULATORY SUPPORT DURING ICU STAY: (refer to main CRF to enter ECMO data)

Use of Intra-Aortic Balloon Pump (IABP):

- YES  
- NO  
- N/A  

If YES,

Date of device insertion: ________ (MM/DD/YYYY)

Date of device explant: ________ (MM/DD/YYYY) or N/A

Use of Impella:

- YES  
- NO  
- N/A  

Date of device insertion: ________ (MM/DD/YYYY)

Date of device explant: ________ (MM/DD/YYYY) or N/A
SECTION 3: PRE-ICU ADMISSION ECHOCARDIOGRAPHY

3.1 Echocardiogram available within 1 year before ICU admission:

- YES  
- NO  
- N/A

If YES
Date of this echo was performed: ______________ (MM/DD/YYYY) or N/A

Please fill in the below values where known

a) Left ventricular measures:
   i) Interventricular septal width
      _______ cm
   ii) Left ventricular end diastolic diameter
        _______ cm
   iii) Posterior wall width
        _______ cm
   iv) Left ventricular end systolic diameter
       _______ cm
   v) Left ventricular end diastolic volume (Biplane)
      _______ mL
   vi) Left ventricular end systolic volume (Biplane)
      _______ mL
   vii) Left ventricular ejection fraction (%) (Simpson’s Biplane)
      _______
   viii) Left ventricular global longitudinal strain (LVGLS) (%)
      _______
   ix) Regional wall motion abnormalities
      - YES  
      - NO  
      - N/A

If YES, (Select all that apply)
- Hypokinesis
- Akinesis
- Dyskinesis
- Not available

b) Right ventricular measures (RV focused view):
   i) Right ventricular basal diameter (cm)
      _______
   ii) Right ventricular mid diameter (cm)
      _______
iii) Right ventricular fractional area change (RVFAC) (%)

iv) Right ventricular free wall strain (RVLS) (%)

C) Presence of moderate to severe valvular abnormalities

- YES
- NO
- N/A

If YES, specify the type of valve dysfunction:

- Aortic Stenosis
- Aortic Regurgitation
- Tricuspid Stenosis
- Tricuspid Regurgitation
- Mitral Stenosis
- Mitral Regurgitation
- Pulmonary Regurgitation
SECTION 4: ECHOCARDIGRAPHY STUDIES PERFORMED DURING THIS ADMISSION (THIS IS A REPETITIVE ITEM, NEW INSTANCES CAN BE ADDED)

4.1 Echocardiogram available at any time during admission:

- YES  
- NO

If YES
Date of echo: ______________ (MM/DD/YYYY) or N/A

Please fill in the below values where known

a) Left ventricular measures (cm):
   i) Interventricular septal width __________
   ii) Left ventricular end diastolic diameter __________
   iii) Posterior wall width __________
   iv) Left ventricular end systolic diameter __________
   v) Left ventricular end diastolic volume (Biplane) __________
   vi) Left ventricular end systolic volume (Biplane) __________
   vii) Left ventricular ejection fraction (%) (Simpson’s Biplane) __________
   viii) Left ventricular global longitudinal strain (LVGLS) (%) __________

   i) Regional wall motion abnormalities
   - YES  
   - NO  
   - N/A

   If YES, (Select all that apply)
   - Hypokinesis
   - Akinesis
   - Dyskinesis
   - Not available

b) Right ventricular measures (RV focused view):


i) Right ventricular basal diameter (cm) 

ii) Right ventricular mid diameter (cm) 

iii) Right ventricular fractional area change (RVFAC) (%) 

iv) Tricuspid regurgitant jet peak velocity (TR V-Max) 

v) Inferior Vena Cava
   1. Size (cm) 
   2. Collapsibility on inspiration of >50%
      YES NO N/A

vi) Right ventricular free wall strain (RVLS) (%) 

c) Presence of moderate to severe valvular abnormalities
   • YES • NO • N/A

If YES, specify the type of valve dysfunction:

i) Aortic
   • Stenosis
   • Regurgitation

ii) Tricuspid
   • Stenosis
   • Regurgitation

iii) Mitral
   • Stenosis
   • Regurgitation

iv) Pulmonary
   • Regurgitation

d) Presence of pericardial effusion
   • YES • NO • N/A

If yes (specify):
   • Mild
   • Moderate
   • Cardiac Tamponade

e) Presence of mechanical circulatory device
   • YES • NO • N/A
If yes (specify):
- Veno-venous (V-V) ECMO
- Veno-Arterial (V-A) ECMO
- Intra-aortic balloon pumping (IABP)
- Impella
- Left ventricular assist device (LVAD)
- Right ventricular assist device (RVAD)
- Others

4.2 Point of care ultrasound available at any time during admission:
- YES  •  NO

If YES
Date of point of care ultrasound: ______________ (MM/DD/YYYY) or N/A

Please fill in the below values where known

a) Left ventricle
   i) Size
      • Normal  • Dilated  • Severely dilated
   ii) Wall thickness
      • Normal  • Increased
   iii) Function
      • Normal  • Mild  • Moderate  • Severe
   iv) Regional wall motion abnormalities
      • Absent  • Present

b) Right ventricle
   i) Size
      • Normal  • Dilated  • N/A
   ii) Function
      • Normal  • Mild  • Severe  • N/A

c) Pericardial effusion
   • Absent  • Small  • Large  • N/A
d) Presence of moderate to severe valvular abnormalities
   • YES
   • NO
   • N/A

If YES, specify the type of valve dysfunction:
   • Aortic Stenosis
   • Aortic Regurgitation
   • Tricuspid Stenosis
   • Tricuspid Regurgitation
   • Mitral Stenosis
   • Mitral Regurgitation
   • Pulmonary Regurgitation

SECTION 5: ADDITIONAL BIOMARKERS OBTAINED DURING THIS ADMISSION (THIS IS A REPETITIVE ITEM, NEW INSTANCES CAN BE ADDED). Please only record the worst value within the 24-h period of assessment.

5.0 NT-pro-BNP

Date of assessment
   Date __/__/__ (format MM/DD/YY)

   (i) NT-proBNP(pg/mL) ___________  (acceptable value 50-18,000)