

# Prepublication Requirements

• Issued December 17, 2021 •



## Updates to the Advanced Disease-Specific Care Certification Programs for Heart Attack

The Joint Commission has approved the following revisions for prepublication. While revised requirements are published in the semiannual updates to the print manuals (as well as in the online *E-dition*®), accredited organizations and paid subscribers can also view them in the monthly periodical *The Joint Commission Perspectives*®. To begin your subscription, call 800-746-6578 or visit <http://www.jcrinc.com>.

**Please note:** Where applicable, this report shows current standards and EPs first, with deleted language struck-through. Then, the revised requirement follows in bold text, with new language underlined.

### APPLICABLE TO THE PRIMARY HEART ATTACK CENTER ADVANCED CERTIFICATION

Effective July 1, 2022

### Program Management (DSPR) Chapter

#### DSPR.1

The program defines its leadership roles.

#### Element(s) of Performance for DSPR.1

1. The program identifies members of its leadership team.



#### ***Requirements Specific to Primary Heart Attack Center Certification***

- ~~a. The program appoints a designated STEMI coordinator and documents the STEMI coordinator's name, role(s), and responsibilities specific to the needs of the program, along with the STEMI coordinator's current curriculum vitae or résumé.~~
- ~~b. The program appoints a designated medical director and documents the medical director's name, role(s), and responsibilities specific to the needs of the Primary Heart Attack Center, along with the medical director's current curriculum vitae or résumé.~~
- ~~c. The medical director or designee(s) is accountable for defining, implementing, and directing the overall primary percutaneous coronary intervention (PCI) program, including responsibility for equipment, personnel, physician competency, privileges, physician availability, quality assurance, and case review conferences.~~

Key: **D** indicates that documentation is required;

**R** indicates an identified risk area;

**Requirements Specific to Primary Heart Attack Center Certification**

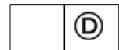
**a. The program appoints a designated medical director who has knowledge and experience in the assessment, diagnosis, and treatment of acute coronary syndrome (ACS), cardiac arrest, and cardiogenic shock and interventions that include percutaneous coronary intervention (PCI). The medical director is accountable for defining, implementing, and directing the interventional cardiology program.**

**Note: Program responsibility includes oversight of personnel, physician competency, physician privileging, physician availability, quality assurance, and case review conferences.**

**b. The program appoints a designated coordinator who has knowledge and experience in managing patients with acute coronary syndrome (ACS), cardiac arrest, and cardiogenic shock and interventions that include percutaneous coronary intervention (PCI).**

---

4. The program leader(s) identifies, in writing, the composition of the interdisciplinary team.

**Requirements Specific to Primary Heart Attack Center Certification**

**a. Patients with symptoms of acute coronary syndrome (ACS) are managed by an interdisciplinary team who work collaboratively across clinical specialties to provide optimal patient-centered care.**

**b. Members of the interdisciplinary team have qualifications, training, and experience working with patients who present with or develop symptoms of ACS, cardiac arrest, or cardiogenic shock and interventions that include percutaneous coronary intervention (PCI). The interdisciplinary team includes, but is not limited to, the following:**

- Emergency room physician(s)
- Advanced practice provider(s) (if utilized by the program)
- Cardiologist(s)
- Interventional cardiologist(s)
- Critical care specialist(s) (if utilized by the program)
- Attending physician or hospitalist
- Nursing staff
- Pharmacist

**c. Based on patient and family needs, the interdisciplinary team also utilizes the following individuals and services as applicable:**

- Physical and occupational therapists
- Nutrition
- Behavioral health services (available on site or by referral)
- Spiritual support services (available on site or by referral)
- Social work and/or case management
- Cardiac rehabilitation (available on site or by referral)
- Financial support

**d. The organization documents the roles and responsibilities for members of its interdisciplinary team.**

---

7. The program leader(s) makes certain that practitioners practice within the scope of their licensure, certification, training, and current competency.

--	--

---

***Requirements Specific to Primary Heart Attack Center Certification***

- a. The program makes certain that licensed practitioners are trained, experienced, and privileged to diagnose and treat patients with acute coronary syndrome according to their scope of practice and in accordance with laws and regulations and organizational procedure(s).
- b. The interventional cardiologist(s) is privileged by the organization to perform interventional cardiology procedures.
- 

## **DSPR.2**

The program is collaboratively designed, implemented, and evaluated.

---

**Element(s) of Performance for DSPR.2**

---

1. The interdisciplinary team designs the program.

--	--

---

***Requirements Specific to Primary Heart Attack Center Certification***

- a. The interdisciplinary team develops guideline-based, institution-specific written protocols for triaging and managing patients who present with ~~signs and symptoms suggestive of STEMI.~~
- b. The program creates a project plan or charter delineating the interdisciplinary team's expectations, accountabilities, and goals.
-

**Requirements Specific to Primary Heart Attack Center Certification**

a. The interdisciplinary team develops guideline-based, institution-specific written protocols for triaging and managing patients who present with or develop signs and symptoms of acute coronary syndrome (ACS) and complications related to ACS, that include, but are not limited to, the following:

- Preferred reperfusion strategy is primary percutaneous coronary intervention (PPCI) with a defined back-up strategy
  - Pre-hospital activation criteria for acute ST-elevated myocardial infarction (STEMI)/STEMI equivalent patients and other life-threatening arrhythmias
  - Emergency department triage criteria for the rapid identification of patients with chest pain/anginal equivalent symptoms
  - Activation and response criteria for the cardiac catheterization laboratory team and interventional cardiologist
  - Patient selection criteria for primary percutaneous coronary intervention (PPCI) (such as STEMI, shock, hemodynamic/electrical instability, advanced heart failure, continued angina)
  - Cardiac risk scoring using an evidenced-based tool for non-ST elevated myocardial infarction (NSTEMI), unstable angina, and chest pain patients
  - Cardiogenic shock resuscitation and management
  - Post-arrest cardiac care including targeted temperature management, if indicated
  - Emergency procedures for adverse events (such as cardiac arrest or cardiogenic shock) occurring during interventional cardiology procedures
  - Transfer criteria for services not provided on site
  - Acceptance of transfer-in patients from non-PCI capable centers
- b. The program creates a project plan or charter delineating the interdisciplinary team’s expectations, accountabilities, and goals.
- c. The program collaborates with emergency medical services (EMS) in developing prehospital treatment guidelines for EMS personnel, including transport of acute ST-elevated myocardial infarction (STEMI)/STEMI equivalent patients directly to a percutaneous coronary intervention (PCI)-capable center.
- d. At least every six months, the program participates in state or regional heart attack–related activities that promote improving heart attack or STEMI systems of care.

2. The interdisciplinary team implements the program.

--	--

**Requirement Specific to Primary Heart Attack Center Certification**

a. At least quarterly, the interdisciplinary team has ~~STEMI~~ meetings related to operational issues, solutions, and metrics demonstrating improvement. Documentation includes roster with discipline (title) listed, attendance records, meeting minutes, exhibits, and handouts.

Key: **(D)** indicates that documentation is required;

**(R)** indicates an identified risk area;

3. The interdisciplinary team evaluates the program.

--	--

***Requirement Specific to Primary Heart Attack Ready Certification***

a. At least quarterly, representatives of the interdisciplinary team participate in meetings to review the assessment, diagnosis, and treatment provided to acute coronary syndrome (ACS) patients, including review of cardiac arrest and cardiogenic shock and treatment interventions such as percutaneous coronary intervention (PCI). Documentation includes attendance records and meeting minutes.

4. The interdisciplinary team uses the results of the program evaluation to improve performance.

--	--

***Requirement Specific to Primary Heart Attack Center Certification***

a. The program has a process to provide feedback to emergency medical service agencies and interfacility transport agencies within 24 to 48 hours.

**DSPR.3**

The program meets the needs of the target population.

**Element(s) of Performance for DSPR.3**

3. The program identifies its target population.

--	--

***Requirement Specific to Primary Heart Attack Center Certification***

a. The program develops a minimum of two community outreach activities per year that include populations that are at higher risk for health care disparities.

4. The services provided by the program are relevant to the target population.

--	--

***Requirement Specific to Primary Heart Attack Center Certification***

a. The program develops an outreach plan for educating the community on heart attack care.

Note: Documentation examples may include advertising campaigns, public service announcements, specific trainings.

***Requirements Specific to Primary Heart Attack Center Certification***

**a. The program performs the following services 24 hours a day, 7 days a week:**

- **12-lead electrocardiogram (ECG)**
- **Chest electromagnetic radiation (X-ray)**
- **Computed tomography (CT) and/or coronary computed tomography angiography (CCTA)**
- **Laboratory testing that includes troponins, complete blood cell counts with platelets, coagulation studies, and blood chemistries**

**b. The program performs the following advanced imaging when indicated by patient need:**

- **Carotid duplex ultrasound**
- **Transesophageal echocardiography (TEE)**
- **Transthoracic echocardiography (Echo)**
- **Diagnostic cardiac stress testing (exercise or pharmacologic)**
- **Cardiac magnetic resonance imaging (cardiac MRI) (on site or by referral)**

**c. The program has a cardiac step-down unit, cardiac telemetry unit, or designated beds available 24 hours a day, 7 days a week for the management of acute coronary syndrome patients.**

**d. The program has a cardiac intensive care unit or designated intensive care beds available 24 hours a day, 7 days a week for the management of critical cardiac patients.**

**DSPR.5**

The program determines the care, treatment, and services it provides.

**Element(s) of Performance for DSPR.5**

6. The program has a process to provide emergency/urgent care.

--	--

***Requirements Specific to Primary Heart Attack Center Certification***

a. The program develops a standardized process for the timely triage, diagnosis, and treatment of a STEMI patient, which includes protocols for the emergency department, whether patients arrive to the emergency department by emergency medical service or walk-in. The process and protocols are documented.

b. Written protocols for the emergency department demonstrate the rapid identification of a STEMI patient, including walk-ins and patients for whom a STEMI diagnostic pre-hospital 12-lead ECG is not available, by acquisition of a 12-lead ECG with the goal of completion within 10 minutes of arrival.

c. The program develops a written protocol for a STEMI alert/call system for prompt activation of the STEMI/catheterization laboratory team. Documentation reflects staff utilization of the call system.

***Requirement Specific to Primary Heart Attack Center Certification***

a. The program develops standardized processes for the timely triage, diagnosis, and treatment of patients who present with or develop signs and symptoms of acute coronary syndrome (ACS) that include, but are not limited to, the following:

- Prehospital activation for all acute ST-elevated myocardial infarction (STEMI)/STEMI equivalent or other life-threatening arrhythmias

- A 12-lead ECG is acquired for all patients presenting to the emergency department with chest pain/anginal equivalent symptoms

- Upon identification of STEMI/STEMI equivalent, immediate activation of the cardiac catheterization team and interventional cardiologist.

Note: This includes prehospital activation when STEMI is identified by emergency medical services.

- Cardiac risk scoring using an evidenced-based tool when ruling out acute myocardial infarction (AMI) for non-STEMI patients

- Initiates targeted temperature management with continued monitoring when return of spontaneous circulation has been achieved, per hospital policy

- Initiates intervention(s) for patients in cardiogenic shock, per hospital policy

7. The program provides the number and types of practitioners needed to deliver or facilitate the delivery of care, treatment, and services.

--	--

***Requirements Specific to Primary Heart Attack Center Certification***

a. The program maintains a 24 hours a day, 7 days a week on-call schedule for catheterization laboratory staff and interventional cardiologist coverage.

b. The program has a process that requires the catheterization laboratory staff and the interventional cardiologist to arrive on-site within 30 minutes of STEMI activation.

Note: The program will provide supporting documentation for the previous 6 months for initial certification. For recertification, the previous 24 months may be reviewed.

c. The program has an emergency/adverse weather contingency plan and policy addressing emergency/weather staffing that addresses a backup plan in the event the catheterization laboratory staff cannot arrive within the required time frame.

**Requirements Specific to Primary Heart Attack Center Certification**

**a. The program has the appropriate number of medical, nursing, and ancillary staff 24 hours a day, 7 days a week to assess, diagnose, and treat patients with acute coronary syndrome (ACS), cardiac arrest, and cardiogenic shock and perform percutaneous coronary intervention (PCI).**

**b. The program has access to cardiology expertise 24 hours a day, 7 days a week.**

**Note: Access to cardiology expertise may be in person, via telemedicine, or phone consultation.**

**c. The program maintains an on-call schedule for the cardiac catheterization team and interventional cardiologist coverage.**

**d. The program develops a contingency plan for when primary percutaneous coronary interventions are unable to be performed (such as weather-related issues impeding staff arrival or equipment failures).**

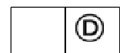
Delivering or Facilitating Clinical Care (DSDF) Chapter

**DSDF.1**

Practitioners are qualified and competent.

**Element(s) of Performance for DSDF.1**

1. Practitioners have education, experience, training, and/or certification consistent with the program's scope of services, goals and objectives, and the care provided.



**Requirements Specific to Primary Heart Attack Center Certification**

~~a. The program has a written policy that describes the formal credentialing process for cardiologists who perform percutaneous coronary intervention (PCI).~~

~~b. The program documents STEMI patients treated on an annual report that indicates percutaneous coronary intervention (PCI) volumes performed by individual interventional cardiologists each month. The annual total number of PCI procedures by cardiologist must be broken down by the following PCI types:~~

- ~~– Primary PCI procedures~~
- ~~– Facilitated/rescue PCI procedures~~
- ~~– Elective PCI procedures~~
- ~~– PCI for STEMI (unstable >12 hours from symptom onset)~~
- ~~– PCI for STEMI (stable >12 hours from symptom onset)~~
- ~~– PCI for STEMI (stable after successful full dose lytic)~~
- ~~– PCI for NSTEMI~~



***Requirements Specific to Primary Heart Attack Center Certification***

**a. The program makes certain that practitioners receive education and training relevant to their roles in the care, treatment, or services of patients presenting with or developing signs and symptoms of acute coronary syndrome (ACS) and complications related to ACS.**

**b. Practitioners demonstrate competence related to the following:**

**- Triage and activation protocols for all patients exhibiting ST-elevated myocardial infarction (STEMI)/STEMI equivalent and life-threatening cardiac arrhythmias**

**- Cardiac resuscitation procedures**

**- Indications and contraindications for intravenous thrombolytic use, including known risks and adverse effects**

**- Initiating and monitoring targeted temperature management**

**- Initiating and monitoring cardiogenic shock management**

**c. The cardiac catheterization team practitioners demonstrate competence related to emergency procedures in response to adverse events occurring during interventional cardiology procedures.**

4. Orientation provides information and necessary training pertinent to the practitioner's responsibilities. Completion of the orientation is documented.

	D
--	---

***Requirements Specific to Primary Heart Attack Center Certification***

**a. Registered nurses who care for cardiovascular patients complete required education and training pertinent to their patient population served, including, but not limited to the following:**

**- Rhythm recognition (such as acute ST-elevated myocardial infarctions (STEMI)/STEMI equivalents and other life-threatening arrhythmias)**

**- Telemetry monitoring systems**

**- 12-lead electrocardiogram (ECG)**

**- Cardiac medications**

**- Advanced mechanical circulatory support devices (if utilized by the program)**

**- Other unit-specific training, as defined by the program**

**b. Staff (as defined by the program) who work in patient care areas are trained on the signs and symptoms of acute coronary syndrome and cardiac arrest and their activation procedures.**

7. Ongoing in-service and other education and training activities are relevant to the program's scope of services.

--	--

Key: **D** indicates that documentation is required;

**R** indicates an identified risk area;

**Requirements Specific to Primary Heart Attack Center Certification**

- a. The program requires training and education for staff members specific to STEMI recognition, identification, and treatment.
- b. The program provides interdisciplinary training and education events for emergency medical service professionals, including 911 and interfacility transport. Documentation of agendas, rosters, or related material is required.

**Requirement Specific to Primary Heart Attack Center Certification**

- a. The program provides ongoing education and training to staff involved in the care of cardiovascular patients. The education and training are provided on an ongoing basis according to the program’s defined intervals, but at a minimum, when staff responsibilities change and/or when new policies, procedures, or guidelines are implemented.  
Note: The format and content of education and training are determined by the program (for example, a skills day, a mock code).

**DSDF.2**

The program develops a standardized process originating in clinical practice guidelines (CPGs) or evidence-based practice to deliver or facilitate the delivery of clinical care.

**Element(s) of Performance for DSDF.2**

- 2. The selected clinical practice guidelines are based on evidence that is determined to be current by the clinical leaders.

--	--

**Requirements Specific to Primary Heart Attack Center Certification**

- a. The program follows current clinical practice guidelines based on recommendations such as those from the American Heart Association (AHA); American College of Cardiology (ACC); American College of Cardiology Foundation (ACCF); European Society of Cardiology (ESC); Heart Failure Society of America (HFSA); and Society for Cardiovascular Angiography and Interventions (SCAI).
- b. The clinical practice guidelines selected by the program address care, treatment, and services, including, but not limited to, the following:
  - ST-elevated myocardial infarction (STEMI)
  - Non-ST-elevated myocardial infarction (NSTEMI) and unstable angina
  - Cardiac interventional procedures
  - Cardiac arrest and targeted temperature management
  - Cardiogenic shock
  - Discharge medications
  - Cardiac rehabilitation
- c. The program identifies which clinical practice guidelines it has selected to develop protocols, policies, and/or procedures.

Key: **D** indicates that documentation is required;

**R** indicates an identified risk area;

3. The program leader(s) and practitioners review and approve clinical practice guidelines prior to implementation.

	D
--	---

***Requirements Specific to Primary Heart Attack Center Certification***

- a. The program’s medical director and coordinator review and approve the clinical practice guidelines used by the interdisciplinary team to develop protocols, policies, and procedures.
- b. The program makes certain that, at a minimum, members of the interdisciplinary team and staff who provide patient care to this patient population are educated on any protocol, policy, and procedural changes.

**DSD.F.3**

The program is implemented through the use of clinical practice guidelines selected to meet the patient's needs.

**Element(s) of Performance for DSD.F.3**

3. The program implements care, treatment, and services based on the patient's assessed needs.

--	--

***Requirements Specific to Primary Heart Attack Center Certification***

- a. Admitted patients are referred to cardiac rehabilitation prior to discharge, if indicated.
- b. Other medical specialties are consulted based on the patient’s assessed needs, which may be in-person or via telemedicine.
- c. Referral for palliative care and hospice/end-of-life services is provided, if indicated.

**DSD.F.5**

The program manages comorbidities and concurrently occurring conditions and/or communicates the necessary information to manage these conditions to other practitioners.

**Element(s) of Performance for DSD.F.5**

1. The program coordinates care for patients with multiple health needs.

--	--

**Requirements Specific to Primary Heart Attack Center Certification**

- a. Written protocols related to the universal acceptance of STEMI patients include the following:
- A plan for accepting simultaneous presentations of STEMI patients
  - An emergency department “no diversion plan” for STEMI patients
  - The ability to provide primary PCI regardless of emergency department diversion status
  - Prioritization of emergent primary PCI for a STEMI patient (that is, postponing a scheduled nonemergent or clinically stable procedure to prioritize the emergent STEMI case)
- b. Call system from a transferring organization with universal patient acceptance by Primary Heart Attack Centers would result in immediate activation of the catheterization laboratory team without the need for additional review or determination of bed availability.
- c. The program has a written protocol(s) designating primary PCI as the standard reperfusion strategy.

Performance Measurement (DSPM) Chapter

**DSPM.1**

The program has an organized, comprehensive approach to performance improvement.

**Element(s) of Performance for DSPM.1**

1. The program leader(s) identifies goals and sets priorities for improvement in a performance improvement plan.

	D
--	---

**Requirement Specific to Primary Heart Attack Ready Certification**

a. In addition to the standardized performance measures, the program selects a minimum of two additional patient care data elements related to assessment, diagnosis, and treatment of acute coronary syndrome and/or interventional cardiology procedures.

2. The program leader(s) involves the interdisciplinary team and other practitioners across disciplines and/or settings in performance improvement planning and activities.

--	--

**Requirements Specific to Primary Heart Attack Center Certification**

- a. The program has a quality improvement program led by the interdisciplinary team to track and improve the treatment of the STEMI patient throughout hospitalization.
- b. The quality improvement program collects the following STEMI patient care data:
- Time of sign/symptom onset, if available, to first medical contact through PCI
  - From PCI through discharge, including cardiac rehabilitation referral, if applicable

Key: **D** indicates that documentation is required;

**R** indicates an identified risk area;

**Requirements Specific to Primary Heart Attack Center Certification**

**a. The program's interdisciplinary team and other practitioners participate in the review of all major adverse cardiac events including, but not limited to, the following:**

- **Unanticipated death**
- **Bleeding/hemorrhage occurrences post-intervention**
- **Stroke occurrences post-intervention**

**b. The program's interdisciplinary team and other practitioners identify opportunities for improving care, treatment, and services to include, but not limited to, the following:**

- **Delayed treatment for minority groups, women, and those who are underserved within their communities**
  - **Failed percutaneous coronary intervention (PCI) requiring emergent interventions such as coronary artery bypass grafting (CABG) and transfer**
  - **Review the assessment, diagnosis, and treatment received for patients with the following:**
    - **Myocardial infarction with no obstructive coronary artery disease (MINOCA)**
    - **Ischemia but no obstructive coronary artery disease (INOCA)**
    - **Spontaneous coronary artery dissection (SCAD)**
  - **Other complications as determined by the organization**
- 

5. The program collects data related to its target population to identify opportunities for performance improvement.

--	--

***Requirements Specific to Primary Heart Attack Center Certification***

a. The program maintains a report(s) showing the total number of PCI procedures by the following types:

- Primary PCI procedures
- Facilitated/rescue PCI procedures
- Elective procedures
- PCI for STEMI (unstable >12 hours from symptom onset)
- PCI for STEMI (stable >12 hours from symptom onset)
- PCI for STEMI (stable after successful full-dose fibrinolytics)
- PCI for NSTEMI

b. The program achieves hospital volume requirements by meeting one of the following options:

- The program performs a minimum of 150 PCI procedures and 36 primary PCI procedures in any consecutive rolling 4 quarters.
- Primary Heart Attack Centers that have not performed 150 total PCI procedures and 36 primary PCI procedures over the most recent 12 months must provide the following documentation:
  - Process for interventional cardiologists to closely monitor clinical outcomes
  - Examples of STEMI systems of care processes/protocols in place; may be regionally adopted processes as well as internal processes
  - Formal association with a larger facility or facilities
  - For sites without on-site surgery, a formal agreement(s) with a facility(ies) that does provide surgery on-site and the associated transfer plan/protocol
  - Rotation schedule of interventionalists, clinical catheter laboratory staff, and hospital support staff at a high volume PCI center

6. The program analyzes its performance measurement data to identify opportunities for performance improvement.

--	--

***Requirement Specific to Primary Heart Attack Center Certification***

a. The quality improvement program identifies outliers in the following metrics and investigates the processes in place to achieve those metrics:

- EMS/first medical contact to PCI within 90 minutes
- EMS/first medical contact to PCI within 120 minutes when transport time is 45 minutes or longer and arrival to PCI is 30 minutes or less (if applicable)
- Patient arrival to 12-lead ECG within 10 minutes or less
- Arrival to PCI within 90 and/or 60 minutes
- Arrival at STEMI receiving center to PCI within 120 minutes for patients transferred to a STEMI receiving center for PCI (no fibrinolytics)
- Patient arrival to fibrinolytic administration in 30 minutes or less (if fibrinolytics are administered)

**DSPM.3**

Key: **D** indicates that documentation is required;

**R** indicates an identified risk area;

The program collects measurement data to evaluate processes and outcomes.

Note: Measurement data must be internally trended over time and may be compared to an external data source for comparative purposes.

**Element(s) of Performance for DSPM.3**

2. The program collects data related to processes and/or outcomes of care.

--	--

**Requirements Specific to Primary Heart Attack Center Certification**

- a. The program documents feedback given to emergency medical services and STEMI-referring hospitals within 24 to 48 hours of patient arrival to the receiving center.
- b. The program monitors the arrival of all members of the cardiac catheterization call teams, including the interventional cardiologist, within 30 minutes of activation.
- c. The program monitors the catheterization laboratory staff and cardiologist arrival times for patients, including those with prolonged transport time (>30 minutes). Documentation includes data that all staff arrived prior to patient's arrival.
- d. The program documents, monitors, and addresses catheterization laboratory staff and cardiologist arrival times outside of the required time frames.

**Requirements Specific to Primary Heart Attack Center Certification**

- a. The program collects data related to emergency medical services (EMS) and interfacility transport agencies and provides feedback on all ST-elevated myocardial infarction (STEMI) patients and other cardiac patients as determined by the program.
- b. The program collaborates with receiving and referring hospitals to facilitate feedback related to transfer processes and other outcomes of care on all ST-elevated myocardial infarction (STEMI) patients and other cardiac patients as determined by the program.