INESSS
LE SAVOIR PREND FORME

AVRIL 2021

GUIDES ET NORMES

Normes relatives à la prise en charge de l'infarctus aigu du myocarde avec élévation du segment ST (IAMEST) au Québec (mise à jour d'avril 2021)

Annexes complémentaires

Une production de l'Institut national d'excellence en santé et en services sociaux (INESSS)

Direction de l'évaluation et de la pertinence des modes d'intervention en santé

Québec

Le présent document contient les annexes complémentaires au rapport *Normes relatives à la prise en charge de l'infarctus aigu du myocarde avec élévation du segment ST (IAMEST) au Québec (mise à jour d'avril 2021).*

Le contenu de cette publication a été rédigé et édité par l'INESSS.

Ces annexes et le rapport final sont accessibles en ligne dans la section *Publications* de notre site *Web*.

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Responsabilité

L'Institut rend accessibles les principales informations qui ont servi à la préparation du rapport *Normes relatives à la prise en charge de l'infarctus aigu du myocarde avec élévation du segment ST (IAMEST) au Québec (mise à jour d'avril 2021)* aux lecteurs qui désirent plus de détails sur sa démarche scientifique.

Ce document n'a pas fait l'objet d'une révision linguistique. Il ne reflète pas forcément les opinions des autres personnes consultées aux fins du présent dossier.

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10 ANS avec vous pour l'EXCELLENCE

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ANNEXE A

Stratégie de repérage d'information scientifique

Bases de données bibliographiques

MEDLINE (Ovid) **Date du repérage : novembre 2019 et janvier 2021** **Limites : 2016- ; anglais, français**	
1	*ST Elevation Myocardial Infarction/ OR *ST Segment Elevation Myocardial Infarction/
2	(STEMI OR "ST elevated myocardial infarction*" OR "ST segment elevation*" OR "ST elevation*").ti.
3	guide*.ti.
4	(1 OR 2) AND 3
5	(areawide OR "area wide" OR citywide OR "city wide" OR co-operat* OR co-ordinat* OR cooperat* OR coordinat* OR "hub and spoke" OR integrated OR network OR networks OR policy OR program OR programme* OR programs OR regional* OR system OR systems).ti,ab.
6	"STEMI project".ti,ab.
7	(2 AND 5) OR 6
8	(delay* OR DIDO OR "door to" OR temporal OR "time to" OR timeliness OR timely OR timing).ti,ab
9	(audit OR clinical governance OR global trigger tool OR health care evaluation OR healthcare evaluation OR healthcare quality OR "quality of health care" OR "quality of healthcare" OR "quality improvement" OR "quality indicator" OR "standard of care").ti,ab.
10	((quality OR performance OR outcome*) AND (assurance OR measure* OR indicator*)).ti,ab.
11	(ambulance* OR "before hospital*" OR "emergency care practitioner*" OR "emergency health service*" OR "emergency health care service*" OR "emergency healthcare service*" OR "emergency helicopter*" OR "emergency medical service*" OR "emergency mobile unit*" OR "emergency practitioner*" OR "emergency rescue" OR "emergency rescuer*" OR "emergency resus*" OR "emergency service*" OR "emergency technician*" OR "emergency treatment*" OR "emergency triage" OR ems OR emt OR "first responder*" OR "mobile emergency unit*" OR nurse OR out-of-hospital OR "out of hospital" OR paramedic* OR prehospital OR pre-hospital OR pre-hospitalization OR prehospitalization OR pre-hospitalisation OR prehospitalisation).ti,ab.
12	("between facilities" OR "between hospitals" OR "facility to facility" OR "hospital to hospital" OR inter-facility OR interfacility OR interhospital OR inter-hospital OR intrahospital OR intra-hospital OR "within hospital").ti,ab.
13	(care transition OR (patient* ADJ2 (dumping OR transfer OR transition OR transport OR turfing)) OR "transition of care").ti,ab.
14	(bypass OR "care pathways" OR ECG OR electrocardiogr* OR protocol OR "surgery on-site" OR trajectory).ti,ab.
15	(fibrinolysis OR fibrinolytic agent* OR fibrinolytic drug* OR PCI OR "percutaneous coronary intervention" OR pharmaco-invasive OR pharmacoinvasive OR PPCI OR primary angioplast* OR primary percutaneous coronary revascularisation* OR primary percutaneous coronary revascularization*).ti,ab.
16	"cardiogenic shock*".ti,ab.
17	OR/8-16
18	2 AND 17
19	4 OR 7 OR 18
20	Animals/ NOT (Humans/ AND Animals/)
21	19 NOT 20

Embase (Ovid) **Date du repérage : novembre 2019 et janvier 2021** **Limites : 2016- ; anglais, français**	
1	*ST Segment Elevation Myocardial Infarction/
2	(STEMI OR "ST elevated myocardial infarction*" OR "ST segment elevation*" OR "ST elevation*").ti.
3	guide*.ti.
4	(1 OR 2) AND 3
5	(areawide OR "area wide" OR citywide OR "city wide" OR co-operat* OR co-ordinat* OR cooperat* OR coordinat* OR "hub and spoke" OR integrated OR network OR networks OR policy OR program OR programme* OR programs OR regional* OR system OR systems).ti,ab.
6	"STEMI project".ti,ab.
7	(2 AND 5) OR 6
8	(delay* OR DIDO OR "door to" OR temporal OR "time to" OR timeliness OR timely OR timing).ti,ab
9	(audit OR clinical governance OR global trigger tool OR health care evaluation OR healthcare evaluation OR healthcare quality OR "quality of health care" OR "quality of healthcare" OR "quality improvement" OR "quality indicator" OR "standard of care").ti,ab.
10	((quality OR performance OR outcome*) AND (assurance OR measure* OR indicator*)).ti,ab.
11	(ambulance* OR "before hospital*" OR "emergency care practitioner*" OR "emergency health service*" OR "emergency health care service*" OR "emergency healthcare service*" OR "emergency helicopter*" OR "emergency medical service*" OR "emergency mobile unit*" OR "emergency practitioner*" OR "emergency rescue" OR "emergency rescuer*" OR "emergency resus*" OR "emergency service*" OR "emergency technician*" OR "emergency treatment*" OR "emergency triage" OR ems OR emt OR "first responder*" OR "mobile emergency unit*" OR nurse OR out-of-hospital OR "out of hospital" OR paramedic* OR prehospital OR pre-hospital OR pre-hospitalization OR prehospitalization OR pre-hospitalisation OR prehospitalisation).ti,ab.
12	("between facilities" OR "between hospitals" OR "facility to facility" OR "hospital to hospital" OR inter-facility OR interfacility OR interhospital OR inter-hospital OR intrahospital OR intra-hospital OR "within hospital").ti,ab.
13	(care transition OR (patient* ADJ2 (dumping OR transfer OR transition OR transport OR turfing)) OR "transition of care").ti,ab.
14	(bypass OR "care pathways" OR ECG OR electrocardiogr* OR protocol OR "surgery on-site" OR trajectory).ti,ab.
15	(fibrinolysis OR fibrinolytic agent* OR fibrinolytic drug* OR PCI OR "percutaneous coronary intervention" OR pharmaco-invasive OR pharmacoinvasive OR PPCI OR primary angioplast* OR primary percutaneous coronary revascularisation* OR primary percutaneous coronary revascularization*).ti,ab.
16	"cardiogenic shock*".ti,ab.
17	OR/8-16
18	2 AND 17
19	4 OR 7 OR 18
20	Nonhuman/ NOT (Human/ AND Nonhuman/)
21	19 NOT 20

EBM Reviews (Ovid) : Cochrane Database of Systematic Reviews; Health Technology Assessment; NHS Economic Evaluation Database **Date du repérage : novembre 2019 et janvier 2021** **Limites : 2016- ; anglais, français**	
1	(STEMI OR "ST elevated myocardial infarction*" OR "ST segment elevation*" OR "ST elevation*").mp.
2	(areawide OR "area wide" OR citywide OR "city wide" OR co-operat* OR co-ordinat* OR cooperat* OR coordinat* OR "hub and spoke" OR integrated OR network OR networks OR policy OR program OR programme* OR programs OR regional* OR system OR systems).ti,ab.
3	(delay* OR DIDO OR "door to" OR temporal OR "time to" OR timeliness OR timely OR timing).ti,ab
4	(audit OR clinical governance OR global trigger tool OR health care evaluation OR healthcare evaluation OR healthcare quality OR "quality of health care" OR "quality of healthcare" OR "quality improvement" OR "quality indicator" OR "standard of care").ti,ab.
5	((quality OR performance OR outcome*) AND (assurance OR measure* OR indicator*)).ti,ab.

6	(ambulance* OR "before hospital*" OR "emergency care practitioner*" OR "emergency health service*" OR "emergency health care service*" OR "emergency healthcare service*" OR "emergency helicopter*" OR "emergency medical service*" OR "emergency mobile unit*" OR "emergency practitioner*" OR "emergency rescue" OR "emergency rescuer*" OR "emergency resus*" OR "emergency service*" OR "emergency technician*" OR "emergency treatment*" OR "emergency triage" OR ems OR emt OR "first responder*" OR "mobile emergency unit*" OR nurse OR out-of-hospital OR "out of hospital" OR paramedic* OR prehospital OR pre-hospital OR pre-hospitalization OR prehospitalization OR pre-hospitalisation OR prehospitalisation).ti,ab.
7	("between facilities" OR "between hospitals" OR "facility to facility" OR "hospital to hospital" OR inter-facility OR interfacility OR interhospital OR inter-hospital OR intrahospital OR intra-hospital OR "within hospital").ti,ab.
8	(care transition OR (patient* ADJ2 (dumping OR transfer OR transition OR transport OR turfing)) OR "transition of care").ti,ab.
9	(bypass OR "care pathways" OR ECG OR electrocardiogr* OR protocol OR "surgery on-site" OR trajectory).ti,ab.
10	(fibrinolysis OR fibrinolytic agent* OR fibrinolytic drug* OR PCI OR "percutaneous coronary intervention" OR pharmaco-invasive OR pharmacoinvasive OR PPCI OR primary angioplast* OR primary percutaneous coronary revascularisation* OR primary percutaneous coronary revascularization*).ti,ab.
11	"cardiogenic shock*".ti,ab.
12	OR/2-11
13	1 AND 12

Sites Web, registres d'essais cliniques, moteurs de recherche et autres bases de données

Date de la consultation : novembre 2019 et janvier 2021
Limites : 2016- ; anglais et français

Sites Web consultés :

Agency for Healthcare Research and Quality (AHRQ)

Agence canadienne des médicaments et des technologies (ACMTS)

Australian Clinical Practice Guidelines (NHMRC)

BCGuidelines.ca

Campbell Collaboration Library of Systematic Reviews

Centre fédéral d'expertise des soins de santé (KCE)

ClinicalTrials.gov

Guidelines International Network (G-I-N)

Haute Autorité de Santé (HAS)

Health Quality Ontario (HQO)

Institute for Clinical Evaluative Sciences (ICES)

Institute of Health Economics (IHE)

International Network for Agencies for Health Technology Assessment (INAHTA)

New Zealand Guidelines Group (NZGG)

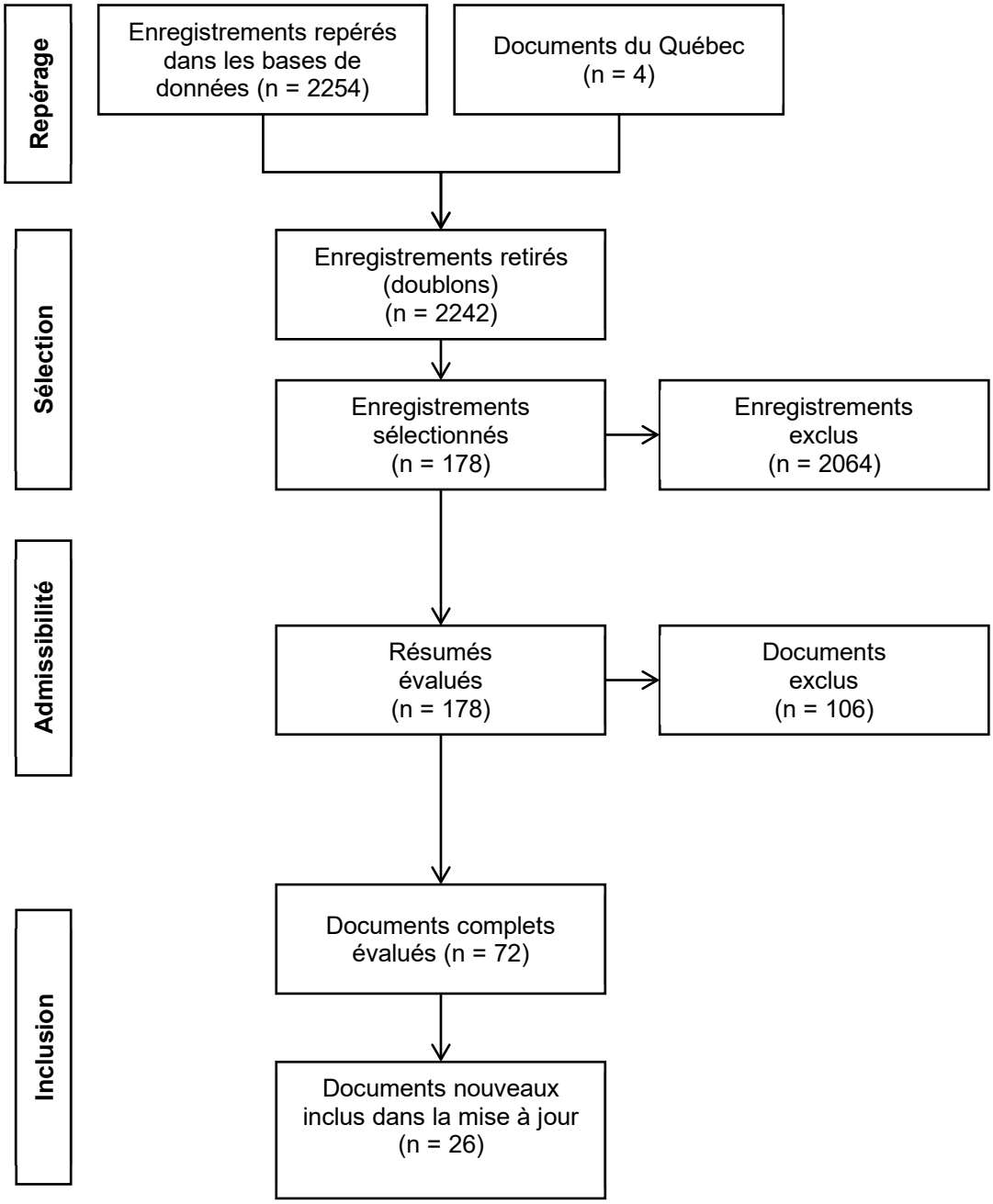
NHS National Institute for Health and Care Excellence

Scottish Intercollegiate Guidelines Network (SIGN)

ANNEXE B

Sélection des documents

Figure B-1 Diagramme de flux



ANNEXE C

Caractéristiques et qualité des documents inclus

Lignes directrices / documents de consensus / registres nationaux						
Étude (1e auteur/année)	Région/ Pays	Recommandations?	Période recherchée	Indicateurs de qualité?	Score de qualité	Domaines visés
1. Wong *et al.*, 2019 (lignes directrices)	Canada	Oui	1998 – 2018, selon le sujet	Oui	AGREEII : 21/28 (75 %)	Tous
2. Ibanez *et al.*, 2018 (lignes directrices)	Union européenne	Oui	Pas spécifiée	Oui	AGREEII : 18/28 (64 %)	Tous
3. NASEMSO, 2019 (lignes directrices)	États-Unis	Oui, mais sans gradation	Mise à jour d'un guide de 2014 et de 2017	Oui	AGREEII : 15/28 (54 %)	Pré-hospitalier
4. AHA, 2018 (Mission Lifeline; registre national)	États-Unis	Ne s'applique pas	Données de 2010-2016	Oui	Ne s'applique pas	Pré-hospitalier, Réseaux
5. NICOR, 2019 (audit)	Royaume-Uni	Ne s'applique pas	Données de 2015/16 et 2017/18	Oui	Ne s'applique pas	Réseaux, Amélioration de la qualité
6. Collège des médecins du Québec (CMQ), 2020 (guide d'exercice)	Québec	Oui (critères)	Pas pertinent (guide d'exercice)	Non	Ne s'applique pas	Pré-hospitalier, Centres non ICP, Centres ICP, Réseaux
7. Zeymer *et al.,* 2020 (document de consensus)	Union européenne	Oui, mais sans gradation	Pas spécifiée	Non	AGREEII : 16/28 (57 %)	Centres non ICP
8. Pilarczyk *et al.*, 2020 (document de consensus)	Allemagne et Autriche	Oui	1990 – 2019	Oui	AGREEII : 23/28 (82 %)	Centres non ICP
9. Beygui *et al.*, 2020 (document de consensus)	Union européenne	Oui, mais sans gradation	Pas spécifiée	Oui	AGREEII : 17/28 (61 %)	Pré-hospitalier, Centres non ICP, Centres ICP et Réseaux
10. Van Diepen *et al.,* 2017 (document de consensus)	États-Unis	Oui, mais sans gradation	Pas spécifiée	Non	AGREEII : 18/28 (64 %)	Centres non ICP

Revues systématiques et méta-analyses								
Étude (1e auteur/année)	Nombre d'études retenues	Régions	Période recherchée	Soins avancés présents	Nombre de patients	Meta-analyse (Oui/Non)	Score de qualité	Domaines visés
1. Alrawashdeh *et al.*, 2020	100	Amérique du Nord (40), Europe (53), Asie-Pacifique (7)	1990 - août 2018	Oui (67)	125 343	Oui	R-AMSTAR : 7,5/11 (68 %)	Pré-hospitalier

Études observationnelles								
Étude (Auteur/Année)	Région/ Pays (taille de la population captive)	Type d'étude (prospective/ rétrospective/ transversale); type de soins ambulancier	Source des données	Période d'observation	Nombre de centres	Nombre de patients	Score de qualité	Domaines visés
1. Froats *et al.*, 2018	Kingston, Ontario (41 000)	Rétrospective; soins primaires seulement	Revue de dossiers médicaux des cas contournés	Fév. 2005 – fév. 2013	1	46 (20-62 mins de transport)	CASP cohorte : 9,5/12 (79 %)	Pré-hospitalier
2. Tanguay *et al.*, 2018	Chaudière-Appalaches (418 000)	Rétrospective; soins primaires seulement	Revue de dossiers des cas transportés	Août 2006 – déc. 2013	2	728	CASP cas témoin : 8/10 (80 %)	Pré-hospitalier
3. Shavadia *et al.*, 2018	États-Unis (pas spécifié)	Rétrospective; pas spécifié	Registre ACTION : revue de dossiers des cas transportés et traités par ICP	Janv. 2015 – mars 2017	744	27 840	CASP cohorte : 10/12 (83 %)	Pré-hospitalier
4. Mitchell *et al.*, 2018	Ottawa, Ontario (pas spécifié)	Rétrospective; soins primaires vs avancés	Revue de dossiers médicaux des cas contournés	2011 – 2015	1	214	CASP cohorte : 9/12 (75 %)	Pré-hospitalier
5. Kwong *et al.*, 2018	Toronto, Ontario (3,5 millions)	Rétrospective; soins primaires vs avancés	Revue de dossiers des cas transportés (y compris contournés)	Avr. 2015 – mai 2016	6	361	CASP cohorte : 9,5/12 (79 %)	Pré-hospitalier
6. Bussières *et al.*, 2018	Chaudière-Appalaches et ville de Québec (pas spécifié, mais ~1 million)	Rétrospective; soins primaires seulement	Revue de dossiers médicaux des cas transportés	Janv. 2007 – juin 2016	1	880	CASP cohorte : 9,5/12 (79 %)	Pré-hospitalier
7. Scholz *et al.*, 2018	Allemagne (pas spécifié, 48 sites partout le pays)	Prospective; pas spécifié, mais le pays utilise les deux types ainsi que médecins	Suivi de l'étude FITT-STEMI; admissions directes aux centres d'ICP par ambulance traité dans les 6 heures depuis FMC	Janv. 2006 – nov. 2015	48	12 675	CASP cohorte : 10,5/12 (88 %)	Pré-hospitalier

Études observationnelles								
Étude (Auteur/Année)	Région/ Pays (taille de la population captive)	Type d'étude (prospective/ rétrospective/ transversale); type de soins ambulancier	Source des données	Période d'observation	Nombre de centres	Nombre de patients	Score de qualité	Domaines visés
8. Bainey *et al.*, 2019	Edmonton, Alberta	Prospective; soins avancés	Registre Vital Heart Response	2006-2011 & 2013-2016	5 (2 centres ICP)	5 583	CASP cohorte : 10/12 (83 %)	Réseaux
10. Granger *et al.*, 2019	États-Unis (65 % de la population capturé)	Prospective; pas spécifié	Registre *ACTION : GWTG* (centres non ICP et centres ICP)	Janv. 2008 – déc. 2012	485	147 466	CASP cohorte : 9/12 (75 %)	Amélioration de la qualité
11. Green *et al.*, 2018	États-Unis (12 états)	Prospective; pas spécifié	Registre *NCDR ACTION* (centres non ICP et centres ICP)	Janv. 2013 – déc. 2014	379	19 287	CASP cohorte : 9/12 (75 %)	Pré-hospitalier, Réseaux
12. Jollis *et al.*, 2018	États-Unis (12 régions métro-politaines)	Prospective; pas spécifié	Registre *ACTION : GWTG* (centres ICP)	Avr. 2015 – mars 2017	132 (946 agences préhosp.)	1 946	CASP cohorte : 8/12 (67 %)	Réseaux, Amélioration de la qualité
13. Scholz *et al.*, 2020	Allemagne	Prospective; pas spécifié, mais le pays utilise les deux types ainsi que médecins	Suivi de l'étude FITT-STEMI & analyse d'un registre national d'ICP; rétroaction aux centres ICP	Oct. 2007 – 2016 (10 ans) & 2008 – 2015	6	4 926 & 398 027	CASP cohort : 9,5/12 (79 %)	Amélioration de la qualité
14. Candiello *et al.*, 2020	Argentine (11 provinces)	Prospective; pas spécifié, mais la plupart des ambulanciers ne font pas de diagnostic préhospitalier	Registre Stent-Save a Life ! Argentina Initiative (centres ICP)	Mars 2016 – févr. 2019	46	3 492	CASP cohorte : 7,5/12 (62 %)	Amélioration de la qualité

ANNEXE D

Tableaux des données

Tableau D-1 Grille d'extraction des données sur les services préhospitaliers d'urgence

Lignes directrices ou documents de consensus					
Auteur/Année	Révision ou nouvelle norme	Sujet	Recommandation/Propos	Force de la recommandation	Niveau de preuve
Wong *et al.*, 2019	Nouvelle	ECG (délais)	We recommend a first medical contact (FMC) to STEMI diagnosis (ECG acquisition and interpretation) time of ≤ 10 minutes.	Forte	Faible
	Révision	ECG (capacité et formation)	Elements of a regional STEMI network: The capability of EMS and emergency department teams to rapidly diagnose and treat STEMI. Regardless of the method used to identify STEMI in the prehospital setting, networks of care should strive to optimize the diagnostic accuracy of PHECG STEMI recognition through education programs, standardized guidelines, and quality improvement programs.	s. o.	s. o.
	Révision	ECG (capacité et formation)	We recommend that EMS personnel acquire an ECG in the field to identify STEMI and alert STEMI care teams of an imminent patient arrival.	Forte	Faible
	Nouvelle	ECG (transmission par télémétrie)	PHECG STEMI identification can be accomplished either by paramedic interpretation in the field, ECG transmission for interpretation by another health care provider, or by automated computer algorithm interpretation. The most appropriate option for prehospital STEMI recognition and advance notification will depend upon the regional resources and expertise. Prehospital transmission might reduce the rate of false positive activations.	s. o.	s. o.
	Révision	Utilisation des protocoles écrits	We recommend that hospitals and EMS services within STEMI networks maintain	Forte	Faible

Lignes directrices ou documents de consensus					
Auteur/Année	Révision ou nouvelle norme	Sujet	Recommandation/Propos	Force de la recommandation	Niveau de preuve
			written, updated STEMI management protocols, and audit treatment delays, reperfusion rates, and false activation rates to monitor quality metrics.		
		Utilisation des protocoles	STEMI regional networks should develop EMS transport protocols that define which patient scenarios mandate a more advanced scope of practice for patient transfer and which reperfusion strategies are appropriate for a given anticipated transfer time.	s. o.	s. o.
	Révision	Transport direct (durée)	Transport times for interfacility transfers or STEMI patients diagnosed in the field: ≤ 60 minutes	s. o.	s. o.
	Révision	Transport direct et les délais	If primary PCI is used as a default reperfusion strategy for suspected STEMI patients in the field, we recommend that patients should bypass non-PCI-capable centres and instead be transported to the nearest PPCI centre with the goal of achieving a maximum FMC-to-device time of ≤ 120 minutes (ideal FMC-to-device time ≤ 90 minutes in urban settings). Fibrinolytic therapy should be considered if this timeline cannot be achieved. *Note : Values and Preferences. The goal of ≤120 minutes was selected to maintain consistency with treatment of STEMI identified at non-PCI-capable centres, and to maximize access to PPCI in rural and remote regions.*	Forte	Faible
	Révision	Accompagnement pendant transport direct – personnel, détérioration clinique	We suggest that PCPs may transport clinically stable STEMI patients from the field to a PPCI centre when an ACP crew is not readily available. If patients under the care of a PCP crew clinically deteriorate en route to a PPCI centre, the ambulance should redirect to the closest ED and/or rendezvous with an ACP crew depending on resource availability in the particular region.	Faible	Faible

Lignes directrices ou documents de consensus					
Auteur/Année	Révision ou nouvelle norme	Sujet	Recommandation/Propos	Force de la recommandation	Niveau de preuve
	Révision	Accompagnement pendant transport direct – personnel	Additional medical personnel or ACPs might be required for transfer if the patient requires intravenous (I.V.) medications that are beyond the scope of PCP care.	s. o.	s. o.
	Nouvelle	Pré-notification du centre receveur	We recommend that EMS personnel acquire an ECG in the field to identify STEMI and alert STEMI care teams of an imminent patient arrival. Decisions related to how best to interpret the prehospital ECG and who provides prearrival STEMI notification should be made at the regional level.	Forte	Faible
	Révision	Protocoles de destination	Evidence suggests that STEMI care is best performed within the setting of an organized STEMI network with a PPCI centre (the “hub”) receiving referrals from surrounding hospitals (the “spokes”) and a defined catchment area from the field via emergency medical services (EMS). STEMI patients can potentially be identified either in the prehospital setting by EMS or in a hospital (with or without PCI capability) within a given regional network of STEMI care. Geographical proximity to centres that perform 24/7 PPCI, along with the presence of appropriate EMS transport systems, can help determine the optimal default reperfusion strategy for these STEMI patients.	s. o.	s. o.
Ibanez *et al.*, 2018	Nouvelle	ECG (délais)	12-lead ECG recording and interpretation is indicated as soon as possible at the point of FMC, with a maximum target delay of 10 min.	Classe I	B
	Révision	Défibrillation	ECG monitoring with defibrillator capacity is indicated as soon as possible in all patients with suspected STEMI.	Classe I	B
	Révision	Défibrillation	It is indicated that all medical and paramedical personnel caring for patients with suspected MI have access	Classe I	C

Lignes directrices ou documents de consensus					
Auteur/Année	Révision ou nouvelle norme	Sujet	Recommandation/Propos	Force de la recommandation	Niveau de preuve
			to defibrillation equipment and are trained in basic cardiac life support.		
	Nouvelle	Utilisation de civière et véhicule	If the diagnosis of STEMI has not been made by the ambulance crew and the ambulance arrives at a non-PCI-capable hospital, the ambulance should await the diagnosis and, if a STEMI diagnosis is made, should continue to a PCI-capable hospital.	s. o.	s. o.
Beygui *et al.*, 2020	Révision	ECG (capacité)	Recommended instrumentation on board: ECG recorder and monitor (mandatory); ECG tele-transmission (mandatory if no physician on board); external cardioverter (mandatory)	s. o.	s. o.
	Révision, nouvelle	ECG (capacité, délais)	ECG should be performed as recommended by ESC guidelines within 10 minutes following first medical contact.	s. o.	s. o.
	Nouvelle	ECG (transmission par télémétrie)	Direct telephone contact between the prehospital team, the emergency medical communication centre and interventional cardiology team, with ECG tele-transmission if necessary, may be very useful in planning reperfusion therapy in the safest and most efficient way in borderline cases. The wide availability of information technologies and fast communication networks has opened the door for the tele-transmission of medical data.	s. o.	s. o.
	Révision	Transport direct et les délais	Prehospital reperfusion strategy for STEMI within 12 hours of start of symptoms: if primary PCI is possible within 120 minutes after FMC (first medical contact), direct transfer for primary PCI is recommended.	s. o.	s. o.

Lignes directrices ou documents de consensus					
Auteur/Année	Révision ou nouvelle norme	Sujet	Recommandation/Propos	Force de la recommandation	Niveau de preuve
NASEMSO, 2019	Révision, nouvelle	ECG (capacité, délais)	The 12-lead EKG is the primary diagnostic tool that identifies a STEMI. It is imperative that EMS providers routinely acquire a 12-lead EKG within 10 minutes for all patients exhibiting signs and symptoms of ACS.	s. o.	s. o.
	Nouvelle	ECG (en série)	Performance of serial EKGs is suggested. Perform serial 12-lead EKGs (especially any time clinical changes noted).	s. o.	s. o.
	Nouvelle	ECG (transmission par télémétrie)	The EKG may be transmitted for remote interpretation by a physician or screened for STEMI by properly trained EMS providers with or without the assistance of computer interpretation.	s. o.	s. o.
	Nouvelle	Pré-notification du centre receveur	Advance notification should be provided to the receiving hospital for patients identified as having STEMI.	s. o.	s. o.
American Heart Association (AHA), 2018	Nouvelle	Pré-notification du centre receveur	Early notification by EMS to the STEMI Receiving Center of suspected or confirmed STEMI patient.	s. o.	s. o.
	Révision	Protocoles de destination	Pre-planned EMS destination protocols	s. o.	s. o.

Revues systématiques					
Auteur/Année	Révision ou nouvelle norme	Sujet	Protocole	Résultats	Conclusions
Alrawashdeh *et al.*, 2020	Révision	Transport direct	Divers	Every 10 min increase in FMC-to-door time was associated with a 5.1% (95% CI 0.6% to 9.5%, p=0.03) reduction in the mean proportion of patients treated within 90 min. After adjusting for door-to-balloon time, a 10-min increase in FMC-to-door time was associated with a 10.6% (95% CI: 7.6% to 13.5%; p<0.001) reduction in the proportion of patients treated within 90 min. The factors significantly associated with FMC-to-door time were urban classification, continent, method of ECG interpretation and ED bypass. The weighted mean door-to-balloon time across 35 studies in our review was almost 60 min, inferring that EMS	Our analysis showed a strong association between EMS delay and the proportion of patients treated by PCI within 90 min of FMC. In addition, our meta-regression analysis, adjusted for door-to-balloon time, showed that a target of >50% of STEMI patients treated within 90 min of FMC could be achieved only when EMS delay is <40 min. Our findings suggest that EMS systems could play an important

Revues systématiques					
Auteur/Année	Révision ou nouvelle norme	Sujet	Protocole	Résultats	Conclusions
				systems should target delays ≤30 min between FMC and hospital arrival. The unadjusted meta-regression showed that mortality rate was not significantly associated with-FMC-to-door time (figure 6A); a 10 min increase in FMC-to-door time was associated with a 0.8% (−0.4% to 2.0%; p=0.21) increase in mortality rate.	role in reducing unnecessary system delays through close performance monitoring and improvements in clinical and operational processes.

Études observationnelles					
Auteur/Année	Révision ou nouvelle norme	Sujet	Protocole	Résultats	Conclusions
Froats *et al.*, 2018	Révision	Transport direct (durée), accompagnement pendant transport direct – personnel	Under the PCI bypass protocol, patients were eligible if they presented with symptoms of chest pain, a 12-lead ECG meeting STEMI criteria, and if transported to the regional PCI center within 60 min. If the ECG is interpreted by the 12-lead analysis program as being positive for STEMI, and if the patient can be driven to the regional PCI center within 60 min, the providers bypass the local hospital and transport the patient directly to the regional PCI center. There is no requirement for contact with a physician before initiating transport. Bypass is to occur regardless of the patient's stability and vital signs, although providers have the option of transporting to the closest hospital if they are uncomfortable bypassing. BLS-only ambulance service in a rural county of 1,750 square miles	There were 46 cases of STEMI bypass between February 2005 and February 2013. Mean transport time was 29.9 min (range 20~62 min). Mean contact-to-balloon time was 95.2 min (range 68–159 min). Forty-two (91.3%) patients survived to hospital discharge. There were no deaths during transport.	Despite transport times greater than that recently recommended by AHA and the use of basic-level providers, the program achieved contact-to-balloon times within target range for patients that would otherwise be transferred from a non-PCI facility (120 min), minimized false-positive diagnoses, and there were relatively few clinically significant adverse events and no deaths during transport. No relationship was found between transport times and risk of an adverse event, with drive times up to 1 h; in our area, BLS providers are able to safely bypass the closest hospital and transport these patients to a PCI center, with drive time exceeding that recommended by the AHA, provided there are reasonable contraindications to bypass. In our region, STEMI patients can be diagnosed accurately

Études observationnelles					
Auteur/Année	Révision ou nouvelle norme	Sujet	Protocole	Résultats	Conclusions
					and transported safely on bypass to a PCI center for primary PCI while respecting target reperfusion times.
	Révision	Accompagnement pendant transport – personnel		Twenty-five adverse events occurred in 20 patients during transport. In 16 of the 20 patients, the adverse events were transiently abnormal vital sign requiring no intervention. In 3 of the patients, the adverse event was clinically significant and it is believed that the patient would have benefitted from advanced cardiac life support care not within the scope of practice of the BLS providers.	BLS providers are able to safely bypass the closest hospital and transport these patients to a PCI center, with drive time exceeding that recommended by the AHA, provided there are reasonable contra-indications to bypass. In our study, patients who experienced clinically significant events that required advanced intervention had abnormal vital signs when the providers initially contacted the patient. our findings would suggest that the addition of vital-sign contra-indications to bypass could minimize the risk of adverse events requiring interventions that BLS providers are incapable of delivering. Conversely, it could be argued that the patients with hemodynamic compromise resulting from STEMI benefit the most from rapid reperfusion, and interventions beyond CPR and defibrillation unnecessarily delay definitive treatment.
Tanguay *et al.*, 2018	Nouvelle	ECG (en série)	The technology has been implemented in the 45 ambulances serving the Chaudière-Appalaches region. It allows for continuous 12-lead ECG acquisition and generates an averaged ECG at 2 minutes intervals (i.e., serial ECGs) during transport	614 (84.3%) had a persistent STE during ambulance transport, while 114 (15.7%) had multiple dynamic ST-segment changes: 81 (11.1%) had an ECG characterized by 1 ST-segment change and 33 (4.5%) had an ECG with ≥ 2 ST-segment changes. 15.7% ST-segment changes:	There is a real benefit to using prehospital serial 12-lead ECGs as it increased the detection of suspected STEMI patients and altered their final destination. From a clinical standpoint, serial 12-lead ECGs appear to be more useful for the triage and

Études observationnelles					
Auteur/Année	Révision ou nouvelle norme	Sujet	Protocole	Résultats	Conclusions
			to the closest designated hospital. Following review by an emergency physician, ECGs were grouped as having either a persistent STE or a dynamic STE that evolved over time. Serial 12-lead ECGs are acquired in all patients with complaints that are consistent with suspected STEMI including thoracic or abdominal pain, difficulty breathing, hypo or hypertension, or abnormal pulse. As there is no computer-assisted interpretation, BLS-EMTs are trained to acquire the initial ECG in the ambulance prior to initiating patient transport to the nearest designated receiving hospital (ED or PCI center) and to wirelessly transmit the first ECG by cellular telephone to staff at an online medical control (OLMC) center without the need to stop the vehicle (24). Subsequent averaged ECGs are then automatically produced and transmitted continuously by the software at 2 minutes intervals until arrival at the designated receiving hospital.	• 8% STEMI following initial No-STEMI ECG; • 6.2% STEMI to No-STEMI on final ECG	management of chest pain patients without a STEMI diagnosis on their initial ECG rather than patients with ECGs evolve from a STEMI to a no-STEMI diagnosis. Indeed, as ECGs can evolve from a no-STEMI to a STEMI diagnosis pattern with one or multiple ST-segment changes, serial 12-lead ECGs enable rapid STEMI detection at any time during transport. Although our results demonstrate that prehospital serial 12-lead ECGs can identify STEMI patients who would otherwise have been missed if a single ECG was performed, it remains unclear whether there is an advantage using serial 12-lead ECG technology over repeated 12-lead ECGs in the prehospital setting. Repeated or serial 12-lead electrocardiograms (ECGs) in the prehospital setting may improve management of patients with subtle ST-segment elevation (STE) or with a ST-segment elevation myocardial infarction (STEMI) that evolves over time.
Shavadia *et al.*, 2018	Nouvelle	Pré-notification du centre receveur	Catheterization laboratory pre-activation was defined as an alert (or activation) by EMS occurring >10 min prior to arrival at the receiving PCI-capable center. Any call to	Compared with no catheterization laboratory pre-activation, pre-activation patients were more likely to: • be directly transported to the catheterization laboratory on hospital arrival (23.3% vs. 5.3%)	Key findings: 1) 41% of pre-hospital identified patients with STEMI undergoing PCI had catheterization laboratory pre-activation ≥10 min before hospital arrival; 2) pre-activation

Études observationnelles					
Auteur/Année	Révision ou nouvelle norme	Sujet	Protocole	Résultats	Conclusions
			activate the catheterization laboratory occurring <10 min prior to or on or after hospital arrival at the PCI center was defined as no catheterization laboratory pre-activation. FMC indicates the time at which the patient was first evaluated by EMS personnel prior to arrival at the PCI-capable hospital. Device activation reflects the earliest time the first device was activated or deployed after wire crossing (balloon, stent, or an adjunct PCI device such as an aspiration thrombectomy catheter). The “door” time indicates the time at first arrival to the PCI-capable hospital.	• have shorter hospital arrival–to–catheterization laboratory arrival time (median 17 min [interquartile range (IQR): 7 to 25 min] vs. 28 min [IQR: 18 to 39 min]) • have shorter door-to-device time (40 min [IQR: 30 to 51 min] vs. 52 min [IQR: 41 to 65 min]) • have a greater likelihood of achieving first medical contact–to–device time ≤90 min (76.6% vs. 68.6%) (p < 0.001 for all). Pre-activation was associated with lower inhospital mortality (2.8% vs. 3.4%; p=0.01).	was associated with a significantly lower likelihood of reperfusion delay for patients presenting during both work hours and off hours; and 3) hospitals with higher rates of pre-activation had lower risk-adjusted in-hospital mortality compared with hospitals with lower pre-activation rates. Optimal pre-hospital STEMI care includes rapid electrocardiographic acquisition and communication of a STEMI diagnosis to the nearest primary PCI center. Every 10-min delay in notifying the receiving catheterization laboratory is associated with increasing door-to-device times. Catheterization laboratory pre-activation was associated with significantly shorter reperfusion times for both work-hour and off-hour presentations. Our results highlight the importance of EMS pre-activating the catheterization laboratory across all presentation times. The longer the amount of advance notification received (catheterization laboratory activation to hospital arrival time), the higher the likelihood of shorter door to device times.

Études observationnelles					
Auteur/Année	Révision ou nouvelle norme	Sujet	Protocole	Résultats	Conclusions
Mitchell *et al.*, 2018	Révision	Accompagnement pendant transport – personnel	Since 2005, Ottawa PCP crews have been transporting patients directly to the PCI centre. This "PCP STEMI Bypass" protocol may lead to prolonged PCP transport time, but faster access to PCI. In our EMS system, most STEMI cases come into dispatch as chest pain calls and therefore response is simply based on closest unit availability.	A clinically important event occurred in 127 (59.3%) of cases: SBP < 90mm Hg (26.2%), HR < 60 (30.4%), HR > 100 (20.6%), arrhythmias 7.5%, altered mental status 6.5%, airway intervention 2.3%. Two patients (0.9%) arrested, both survived. Of the events identified, 42.5% could be addressed differently by ACP protocols. The majority related to fluid boluses for hypotension (34.6%). In the ACP intercept group, ACPs acted on 51.6% of events.	Although clinically important events are common in STEMI bypass patients, a smaller proportion of events would be addressed differently by ACP compared with PCP protocols. Further evidence supporting that serious clinically important events were infrequent is apparent by the fact that ACPs intervened in only about half of the events occurring in the ACP-intercept group. The majority of clinically important events were transient and of limited clinical significance. PCP-only crews can safely transport STEMI patients directly to primary PCI.
Kwong *et al.*, 2018	Révision	Accompagnement pendant transport – personnel	PCPs had been previously trained in 12-lead electrocardiogram (ECG) acquisition and STEMI recognition using manual, aided by computer, interpretation. The guideline identified three groups of patients: 1) stable; 2) unstable; 3) diversion. PCPs were authorized to transport stable patients directly to the PCI centre or, for unstable patients, to inform dispatch to request an en route ACP rendezvous, whereby dispatch advised a rendezvous location depending on the proximity of the ACP and PCP crews. PCPs were also authorized to request a	For PCP patients, 21/232 (9.1%) had indications for an ACI, whereas 34/129 (26.4%) ACP patients received an ACI. The median difference between direct PCP bypass and a PCI-centre versus transport to the closest ED was 5.53 minutes (IQR= 6.71).	Of note, the majority (29/48) of the ACIs performed by ACPs were a saline bolus, which may be within the scope of practice of PCPs. Our findings verify that additional transport time incurred by a STEMI bypass is relatively short compared to transporting STEMI patients to the closest hospital with the need for subsequent interfacility transfer. Our results also suggest that the median additional time incurred by providing an ACP-rendezvous compared to direct PCP bypass is low (7.49 v. 5.53 minutes) when considering hemodynamically unstable patients who are more likely to receive an ACI or experience

Études observationnelles					
Auteur/Année	Révision ou nouvelle norme	Sujet	Protocole	Résultats	Conclusions
			rendezvous if they were uncertain of the appropriate course of action. If a rendezvous was not possible, the PCP continued transport to the PCI centre. Patients meeting diversion criteria were to be transported to the closest ED whether or not the receiving hospital had a PCI centre.		cardiac arrest characterized by an initial rhythm of PEA or asystole. Overall, our observations provide additional evidence supporting the safety of PCP transport of hemodynamically stable STEMI patients.
Bussières *et al.*, 2018	Révision, nouvelle Nouvelle Révision	ECG (transmission par télémétrie) Pré-notification du centre receveur par un centre de coordination de soins Transport (durée)	We performed a health records review of STEMI patients transported by ambulance to a tertiary cardiology centre. All remotely diagnosed STEMI patients transported directly by ambulance to the tertiary cardiology centre for PCI (IUCPQ-UL) between January 2007 and June 2016 were included. Patients with dementia, dialysis, or instability who required immediate medical care were excluded. According to the *Unité de coordination clinique des services préhospitaliers d'urgence* (UCCSPU) protocol, the interval time between a first positive ECG and arrival at the PCI centre should be ≤60 minutes, and the mean interval between arrival at the PCI centre and balloon inflation in the cardiac catheterization laboratory is 30 minutes. Automated continuous ECGs were performed every 2 minutes and BLS paramedics received online	Clinically important and minor events were experienced by 18.5% and 12.2% of STEMI patients, respectively. The most frequent clinically important events observed were severe hypotension (6.1%) and ventricular tachycardia/ventricular fibrillation (5.1%). No deaths were recorded during prehospital transport. Overall, 40 (4.5%) patients suffered greater or equal to two clinically important events, 32 (3.6%) patients experienced two clinically important events, and 7 (0.8%) and 1 (0.1%) suffered from three and four events, respectively. Transport time was not associated with clinical events (global p-value = 0.19). Ages 74-97 were found to be statistically significant at the 0.05 level when controlling for transportation time and sex (p = 0.03).	The occurrence of these adverse events was common in our study population with 30.7% of STEMI patients experiencing at least one event during transport, with more than half of the events being classified as clinically important. Furthermore, we observed that STEMI patients with longer transport times to the PCI centre did not experience more clinical events compared to patients with shorter transport times. However, clinical events were more frequent in the older age group (74-97), which could mean that these patients are more at risk from clinical events, regardless of the transportation time. Our findings demonstrate that rural STEMI patients can be safely transported by BLS paramedics over long ambulance runs (≥30 minutes).

Études observationnelles					
Auteur/Année	Révision ou nouvelle norme	Sujet	Protocole	Résultats	Conclusions
			medical support allowing for the identification of new STEMI cases during transport and rapid rerouting to PCI centres. In the Québec City area, BLS paramedics had to transmit the ECG to UCCSPU before ambulance departure at the pickup location and could not benefit from online medical support. During ambulance transport, paramedics verbally communicated clinical data to the UCCSPU nurse according to the Alert, Voice, Pain, Unresponsive (AVPU) scale, distance to hospital, and any deaths that occurred during prehospital transport. Transport time was defined as the duration between departure from the pickup location and arrival at the hospital. The nurse on duty entered all data in the UCCSPU clinical database after each episode of care. Each nurse received training on data entry.		
Scholz *et al.*, 2018	Nouvelle Nouvelle	ECG (délais) Pré-notification du centre receveur	Participation in the FITT-STEMI consortium required that all participating hospitals endorsed the key strategies of the American College of Cardiology initiative for the management of patients with STEMI,17 which are the establishment of multidisciplinary treatment teams to develop guideline-based written protocols for	Recording an ECG within the guideline recommended first 10 min after EMS arrival resulted in an additional gain of 4.2 min in the time to reperfusion. Notably, OHCA (17.3min) and CS upon hospital arrival (6.9min) both significantly contributed to system delay. For patients treated within 60 to 180min from the first medical contact, we found a nearly linear relationship between contact-to-balloon times and	We found that longer intervals from the first medical contact to revascularization enhance the risk of death, even when adjusted for OHCA and CS, which both significantly delayed the time to interventional treatment and were both linked to higher mortality. Most importantly, we observed that, in CS- and in OHCA patients, shorter times to reperfusion

Études observationnelles					
Auteur/Année	Révision ou nouvelle norme	Sujet	Protocole	Résultats	Conclusions
			triaging and managing patients presenting with symptoms suggestive of STEMI, activation of the catheterization laboratory through a single-call system by the emergency department physician, and prompt availability of a skilled cardiac intervention team within 30min. Feedback quality control of the participating PCI centres was performed quarterly during the first month of each quarter beginning in the second quarter after joining the FITT-STEMI consortium. Outcome data for each local study site were discussed on a regular basis in interactive sessions with members of the participating interdisciplinary treatment teams, including local EMS, physicians, and nurses working in the emergency department and the emergency responding system, staff members in the catheterization laboratory and interventional cardiologists. In addition, the following pre-defined key quality indicators were routinely assessed for each participating study site: percentage of pre-hospital electrocardiogram (ECG) recordings within and longer than 10min after the first medical contact (i.e. arrival-time of EMS), percentage of patients with telephone announcement in advance,	mortality in all four STEMI groups. In CS patients with no OHCA, every 10-min treatment delay resulted in 3.31 additional deaths in 100 PCI-treated patients. This treatment delay-related increase in mortality was significantly higher as compared to the two groups of OHCA patients with shock (2.09) and without shock (1.34), as well as to hemodynamically stable patients (0.34, P<0.0001).	considerably improved the outcome, with surprisingly low mortality in OHCA patients in our study. In patients with CS, the time elapsing from the first medical contact to primary PCI is a strong predictor of an adverse outcome.

Études observationnelles					
Auteur/Année	Révision ou nouvelle norme	Sujet	Protocole	Résultats	Conclusions
			proportion of patients with telemetry-ECG transmission, as well as average and median components of times to treatment, including those from the first medical contact to balloon inflation.		
Green *et al.*, 2018	Révision	Protocoles de destination	We identified all patients with STEMI who arrived at the final destination hospital Acute Coronary Treatment and Intervention Outcomes Network (ACTION PCI center) by EMS using ACTION Registry-Get With The Guidelines (ACTION Registry-GWTG) data from January 1, 2013, to December 31, 2014. States that had implemented their policies by 2013 were selected as case states in our analysis. Using a greedy matching algorithm, 6 states with hospital destination policies (cases) were matched to 6 states without hospital destination policies (controls) a priori on region, hospital density, and percent state participation in the registry. We constructed several regression models to isolate the effects of living in states that have adopted hospital destination policies. Our key outcomes were (1) primary PCI within 90 minutes and (2) 120 minutes from FMC and (3) overall receipt of reperfusion therapy.	Rates of prehospital ECG utilization were high, and patients in states with hospital destination policies were more likely to have a prehospital ECG obtained (74.7%) than patients in states without hospital destination policies (68.7%). The time of symptom onset to hospital arrival was no different between the 2 groups, even though patients in states with hospital destination policies received treatment faster from the time of FMC. The median time from symptom onset to hospital arrival was quite lengthy in both groups, 1.5 hours overall with a 25th quartile of 1 hour and a 75th quartile of 2.7 hours. First, patients living in states that have adopted hospital destination policies were significantly more likely to receive timely primary PCI. This time advantage persisted at 90 and 120 minutes from FMC, respectively (odds ratio [OR], 1.59; 95% confidence interval [CI], 1.19–2.12 and OR, 1.44; 95% CI, 1.06–1.95). Second, overall unadjusted rates of receipt of any reperfusion therapy were high at 96.8%, with a trend toward higher use for patients in states with hospital destination policies in the adjusted analysis (OR, 1.77; 95% CI, 0.96–3.24). In summary, living in a state with a statewide prehospital plan for	Our study suggests that statewide hospital destination policies for STEMI organized by the state government allow EMS providers to more effectively triage patients to meet guideline recommendations. STEMI patients living in states with statewide hospital destination policies were more likely to receive any reperfusion therapy and were more likely to receive timely PCI than STEMI patients in states without such policies. A key challenge we noted was that a substantial number of patients failed to access EMS or delayed accessing EMS. For example, 27% of potentially eligible (129 968/478 285) STEMI patients in our study self-transported to a hospital, without using EMS. Thus, failure to access EMS identifies yet another objective for process improvement. In our study, time from symptom onset to presentation remained a substantial barrier to timely care in both study groups. This factor is largely influenced by the time it takes for a patient to call EMS. Community health literacy about heart attack symptoms and the

Études observationnelles					
Auteur/Année	Révision ou nouvelle norme	Sujet	Protocole	Résultats	Conclusions
				EMS transport of STEMI patients is associated with faster treatment times. After adjustment for patient- and state-level characteristics, 57.9% (95% CIs, 53.2%–62.5%) of patients living in states with hospital destination policies when compared with 47.5% (95% CIs, (43.4%–51.7%) living in states without hospital destination policies received primary PCI within their relevant guideline-recommended time from FMC.	importance of calling 9-1-1 remain additional barriers to timely STEMI care. Although statewide EMS mandates for hospital transport of STEMI patients seem to expedite guideline-compliant STEMI care, delay or failure to access EMS remains an important objective for improvement. Our finding that a state-level policy intervention focused on EMS processes improved STEMI care is consistent with prior studies showing that modifying EMS processes can improve STEMI care without increasing the number of PCI providing centers.

Tableau D-2 Grille d'extraction de données sur les centres non ICP

Lignes directrices ou documents de consensus					
Auteur/Année	Révision ou nouvelle norme	Sujet	Recommandation/Propos	Force de la recommandation	Niveau de preuve
Wong *et al.*, 2019	Révision	Stratégie de traitement	We recommend against a strategy of pharmacologic facilitation with full-dose fibrinolysis or combination fibrinolysis and GPI or GPI when access to cardiac catheterization is available within 120 minutes of FMC.	Forte	Élevé
	Révision	Choc cardiogénique	We suggest that fibrinolysis before transfer to a PCI centre be considered in patients with STEMI complicated by cardiogenic shock when excessive delays to cardiac catheterization are anticipated. The writing group recognizes that Canada's unique geography and climate might contribute to very long transport times to PCI-capable hospitals for patients who present to nonurban hospitals or remote nursing stations. We valued the potential benefits of fibrinolysis reperfusion in such a setting for the treatment of this time-sensitive condition that is associated with a high mortality rate.	Faible	Très faible
	Nouvelle	Fibrinolyse	Practical tip. A half dose of fibrinolytic therapy may be considered for patients undergoing a pharmacoinvasive strategy who are older than 75 years of age.	s. o.	s. o.
	Nouvelle	Transfert interhospitalier (durée)	Transport times for interfacility transfers ≤ 60 minutes. Regional goal: ≥ 75% of cases to achieve target metric.	s. o.	s. o.
	Nouvelle	Transfert interhospitalier (complications)	We suggest that PCPs may transport clinically stable STEMI patients from a non-PCI centre to a PCI centre when an ACP crew is not readily available. For patients who have hemodynamic instability, early CS, respiratory failure, life-threatening arrhythmias, or are comatose post arrest, transport should be facilitated by a critical care crew and/or medical personnel from the sending facility.	Faible	Faible
	Nouvelle	Transfert interhospitalier	Additional medical personnel or ACPs might be required for transfer if the patient requires intravenous (I.V.) medications that are beyond the scope of PCP care.	s. o.	s. o.
	Non modifiée	Transfert interhospitalier (délais)	If primary PCI is used as a default reperfusion strategy, we recommend a target door-in-door-out time at the transferring hospital of ≤ 30 minutes. Door-in to door-out time for emergency departments ≤ 30 minutes. Regional goal: ≥ 75% of cases to achieve target metric.	Forte s. o.	Faible s. o.
	Non modifiée	ECG (délais)	We recommend a first medical contact (FMC) to STEMI diagnosis (ECG acquisition and interpretation) time of ≤ 10 minutes. Regional goal: ≥ 75% of cases to achieve target metric.	Forte s. o.	Faible s. o.

Lignes directrices ou documents de consensus					
Auteur/Année	Révision ou nouvelle norme	Sujet	Recommandation/Propos	Force de la recommandation	Niveau de preuve
Ibanez *et al.*, 2018	Nouvelle	Transfert interhospitalier	It is recommended that patients presenting to a non-PCI-capable hospital and awaiting transportation for primary or rescue PCI are attended in an appropriately monitored area (e.g. the emergency department, CCU/ ICCU, or intermediate care unit)	Classe I	C
	Révision	Choc cardiogénique	Fibrinolysis should be considered in patients presenting with cardiogenic shock if a primary PCI strategy is not available within 120 min from STEMI diagnosis and mechanical complications have been ruled out.	Classe IIa	C
			Immediate PCI is indicated for patients with cardiogenic shock if coronary anatomy is suitable. If coronary anatomy is not suitable for PCI, or PCI has failed, emergency CABG is recommended.	Classe I	B
Collège des médecins du Québec (CMQ), 2020	Nouvelle	Personnel d'accompagnement (délais)	L'équipe médicale sur place assure l'accessibilité aux soins 24 heures par jour, 7 jours par semaine. Des ressources médicales, visant une disponibilité dans un délai de 30 minutes, doivent assurer l'accompagnement médical dans le cadre du transfert urgent d'un patient vers un autre centre hospitalier, le tout décrit dans une politique hospitalière sur les transferts interétablissements et les corridors de service en place.	s. o.	s. o.
	Information possiblement utile pour une trousse d'outils		L'utilisation d'une phase dite « time out » par l'équipe de transport avant le transfert ou suivant une mobilisation du patient s'est avérée efficace pour sa sécurité. Recourir à une feuille de contrôle dite « checklist » favorise cette approche sécuritaire : Identification du patient, liste des diagnostics et raisons du transfert; Documentation complète, y compris les examens d'imagerie et de laboratoire, dossier médical du patient; Destination exacte, dont le site intrahospitalier précis; Vérification des conditions météorologiques pour la planification du temps et de l'équipement requis (ex. : suppléance en oxygène); Nom du médecin référent et du médecin ayant accepté le transfert; Vérification de tout l'équipement de transport, dont l'équipement requis en cas de détérioration/complication; Durée du transport avec ajustement en conséquence de l'équipement requis et information transmise au personnel habilité; Expérience de l'équipe de transport en anticipation et plans «B».		
	Nouvelle	Rôles et responsabilités	Le médecin qui a la charge du patient au centre d'origine, c'est-à-dire le médecin traitant pour l'épisode de soins, a la responsabilité d'évaluer l'état du patient, de déterminer le moment du transfert, de préciser le niveau de soins à prodiguer durant le transfert, de s'assurer du niveau de compétence des membres assignés au transfert, compte tenu de son état ainsi que de sa destination précise. Les responsabilités du médecin traitant lors de l'épisode de soins doivent être assumées par	s. o.	s. o.

Lignes directrices ou documents de consensus					
Auteur/Année	Révision ou nouvelle norme	Sujet	Recommandation/Propos	Force de la recommandation	Niveau de preuve
			ce dernier. Si ce médecin a peu ou pas d'expérience en médecine du transport, il doit en informer le médecin receveur pour obtenir ses recommandations spécifiques ou consulter un médecin responsable du transport des patients dans un état critique vers l'établissement de transfert ou receveur, ou un médecin ayant cette expérience.		
	Nouvelle	Consentement	Le consentement du patient (ou de celui qui détient la responsabilité du consentement substitué) concernant les bénéfices et les risques associés au transport devrait être obtenu lorsque son état le permet, et les informations pertinentes à ce consentement (ou à l'impossibilité de l'obtenir) doivent être consignées au dossier.	s. o.	s. o.
Collège des médecins du Québec (CMQ), 2020	Nouvelle	Transfert interhospitalier (personnel, communication)	Si le médecin n'accompagne pas le patient durant le transfert, l'établissement doit faire en sorte que le personnel accompagnateur puisse communiquer en tout temps avec le médecin qui a la charge du patient au centre d'origine. Une communication fluide entre le médecin responsable du transfert et le personnel accompagnateur (ex. : technicien ambulancier paramédic, inhalothérapeute, infirmière) est capitale, et ce, tout autant avant que pendant le transport.	s. o.	s. o.
	Information possiblement utile pour une trousse d'outils		En résumé, les critères sont les suivants : Lorsque requis, le patient doit être transféré vers un établissement (installation) apte à répondre à ses besoins médicaux; Il doit y avoir communication entre les responsables médicaux des centres référent et receveur pour que l'échange d'informations cliniques ait lieu avant le transfert. Cet échange doit inclure le transfert complet des informations pertinentes (état clinique, paramètres physiologiques, actes posés avant et durant le transport, paramètres de perfusion et ventilation, complications durant le transport); Un résumé médical approprié, incluant les tracés d'électrocardiogramme, l'imagerie médicale complétée et les résultats des autres tests diagnostiques, doit figurer dans le dossier du patient transféré; Le patient doit être transféré par du personnel compétent en la matière, au fait de son état et disposant de l'équipement requis approprié; L'option du mode de transport doit être discutée entre médecin référent et médecin receveur.		

Lignes directrices ou documents de consensus					
Auteur/Année	Révision ou nouvelle norme	Sujet	Recommandation/Propos	Force de la recommandation	Niveau de preuve
	Nouvelle	Transfert interhospitalier (personnel)	La sécurité du patient durant son transport doit être au centre de cette décision. En général, lorsque le patient a présenté un état hémodynamique instable ou précaire avant le transfert ou que cette situation est prévisible durant le transfert, l'accompagnement par un médecin est requis, à moins de situations absolument exceptionnelles que le médecin peut et pourra justifier, et dans la mesure où l'équipe accompagnatrice est à même de maintenir la continuité des soins et d'intervenir de façon sécuritaire s'il y a des complications. Les patients qui y sont décrits devraient bénéficier d'un tel accompagnement : 1. Tout patient ayant présenté un arrêt cardiorespiratoire avant ou durant le séjour (en salle d'urgence ou dans un autre site) dans le centre référent avant le transfert. Ceci, à l'exclusion d'une tachycardie ou d'une fibrillation ventriculaire unique, brève et rapidement convertie lors d'un infarctus aigu, et ce, sans avoir eu besoin d'une intubation. 2. Tout patient avec instabilité des signes vitaux ou neurologiques, y compris des perturbations neurologiques induites par une intervention ou une médication (ex. : patient intubé, sous sédation et curare) : -détresse respiratoire sévère : fréquence respiratoire > 32/minute ou < 8/minute, ou saturation en oxygène < 90 %, ou cyanose; -bradycardie symptomatique : < 45/minute; -hypotension artérielle : systolique < 80 mmHg; -signes neurologiques : altération de l'état de conscience susceptible de mettre en danger la perméabilité des voies aériennes, que ce soit de façon primaire ou secondaire à une intervention ou à une médication (ex. : patient intubé, sous sédation et curare). 3. Tout patient en infarctus du myocarde : -en choc ou présentant une hypotension (systolique < 80 mmHg) avec risque d'instabilité; -présentant des complications mécaniques (CIV aiguë, rupture du muscle papillaire avec insuffisance mitrale sévère, etc.); -présentant une bradycardie sévère symptomatique (< 45/minute), ou un bloc AV du 2e ou 3e degré; -ayant présenté une arythmie ventriculaire maligne (tachycardie ventriculaire soutenue, tachycardie polymorphe ou fibrillation ventriculaire à répétition). Le personnel accompagnant doit être formé et compétent en défibrillation cardioversion, cardiostimulation et reconnaissance d'arythmies.		

Lignes directrices ou documents de consensus					
Auteur/Année	Révision ou nouvelle norme	Sujet	Recommandation/Propos	Force de la recommandation	Niveau de preuve
Beygui *et al.*, 2020	Non modifiée	Transfert interhospitalier (délais)	Door-in to door-out time for non-PCI hospitals ≤ 30 minutes.	s. o.	s. o.
	Révision	Choc cardiogénique	Unstable patients (i.e., hemodynamic instability, respiratory distress) and/or those who fail to respond adequately to the treatment should be transferred to emergency departments with critical care facilities and/or to intensive cardiac care units. Patients with refractory heart failure and cardiogenic shock may be more adequately transferred to centres with onsite possibility of circulatory assistance.	s. o.	s. o.
Pilarczyk *et al.*, 2020	Révision	Choc cardiogénique	Emergency PCI of the culprit lesion is indicated for patients with cardiogenic shock due to STEMI or NSTE-ACS, independent of time delay of symptom onset, if coronary anatomy is amenable to PCI.	Forte	1+
Zeymer *et al.*, 2020	Révision	Choc cardiogénique	All patients with infarct-related cardiogenic shock should be directly admitted by the emergency system to a PCI hospital. Since a number of patients will need more advanced care with immediate CABG surgery or mechanical circulatory support (MCS) devices, which are not available in most hospitals, it seems prudent to establish regional cardiogenic shock centres. These centres should be equipped with at least two catheterization laboratories with PCI service, on-site surgery and be experienced in the use of at least two MCS devices. All efforts should be made to reduce ischemic time in cardiogenic shock.	s. o.	s. o.
Van Diepen *et al.,* 2017	Révision	Choc cardiogénique	Medical and technological capabilities of cardiogenic shock centers should include 24-h/7-d primary PCI, cardiac surgery, IABP, percutaneous VAD, implantable VAD and ECMO.	s. o.	s. o.

Tableau D-3 Grille d'extraction de données sur les centres ICP

Lignes directrices ou documents de consensus					
Auteur/Année	Révision ou nouvelle norme	Sujet	Recommandation/Propos	Force de la recommandation	Niveau de preuve
Wong *et al.*, 2019	Non modifiée	Seul appel	We recommend development of a STEMI network of care that incorporates the use of prehospital catheterization laboratory activation, single-call patient transfer protocols, and in-field bypass of non-PCI centres to minimize FMC-to-device times for patients who are treated with PPCI.	Forte	Modéré
			Elements of a regional STEMI network: -For PPCI, the ability for EMS and emergency departments to activate the STEMI team for reperfusion therapy through a "single call"	s. o.	s. o.
	Non modifiée	Processus	We suggest it is reasonable to routinely transport STEMI patients identified in the prehospital setting by EMS directly to the catheterization laboratory by bypassing the PCI centre ED.	Faible	Très faible
	Nouvelle	Structure	Geographical proximity to centres that perform 24/7 PPCI, along with the presence of appropriate EMS transport systems, can help determine the optimal default reperfusion strategy for these STEMI patients.	s. o.	s. o.
	Non modifiée	ECG (délais)	FMC to diagnosis (ECG acquisition and interpretation) ≤ 10 minutes. Regional goal: ≥ 75% of cases to achieve target metric.	Forte	Faible
	Révision, nouvelle	Processus (délais)	Time from arrival at catheterization lab to first device activation ≤ 30 minutes. Regional goal: ≥ 75% of cases to achieve target metric.	s. o.	s. o.
	Révision	Processus (délais)	Total time from FMC to first device activation (for primary PCI), for patients presenting to PCI centres ≤ 90 minutes. Regional goal: ≥ 75% of cases to achieve target metric.	s. o.	s. o.
Ibanez *et al.*, 2018	Contexte seulement	Indication	Reperfusion therapy is indicated in all patients with symptoms of ischaemia of ≤ 12 h duration and persistent ST-segment elevation.	Classe I	A
	Non modifiée	Processus	It is recommended that patients transferred to a PCI-capable centre for primary PCI bypass the emergency department and CCU/ICCU and are transferred directly to the catheterization laboratory.	Classe I	B
	Révision	Structure	It is recommended that primary PCI-capable centres deliver a 24/7 service and are able to perform primary PCI without delay.	Classe I	B
	Contexte seulement	Stratégies de reperfusion	A primary PCI strategy is recommended over fibrinolysis within indicated timeframes.	Classe I	A
	Nouvelle	Structure	It is indicated that all hospitals participating in the care of STEMI patients have a CCU/ICCU equipped to provide all aspects of care for STEMI patients, including treatment of ischaemia, severe heart failure, arrhythmias, and common comorbidities.	Classe I	C

Lignes directrices ou documents de consensus					
Auteur/Année	Révision ou nouvelle norme	Sujet	Recommandation/Propos	Force de la recommandation	Niveau de preuve
Collège des médecins du Québec (CMQ), 2020	Nouvelle	Structure	L'équipe médicale sur place assure l'accessibilité aux soins 24 heures par jour, 7 jours par semaine. Des ressources médicales, visant une disponibilité dans un délai de 30 minutes, doivent assurer l'accompagnement médical dans le cadre du transfert urgent d'un patient vers un autre centre hospitalier, le tout décrit dans une politique hospitalière sur les transferts interétablissements et les corridors de service en place.	s. o.	s. o.
NICOR, 2019	Révision	Seul appel	All ambulance services and hospitals should put in place a single point of contact at the PPCI centre to activate the PCI team, which should be ready to receive the patient on arrival.	s. o.	s. o.
Beygui *et al.*, 2020	Révision	Processus (délais)	Recommended FMC to wire/balloon: ≤ 90 minutes (preferred); ≤ 120 minutes (acceptable)	s. o.	s. o.

Tableau D-4 Grille d'extraction de données sur les réseaux

Lignes directrices ou documents de consensus					
Auteur/Année	Révision ou nouvelle norme	Sujet	Recommandation/Propos	Force de la recommandation	Niveau de preuve
Wong *et al.*, 2019	Révision	Réseaux, protocoles	We recommend the development and implementation of regional STEMI networks using a hub-and-spoke model to define optimal reperfusion strategies, reduce reperfusion delay, improve reperfusion rates, and apply protocols for comprehensive ongoing STEMI care.	Forte	Modéré
	Révision	Protocoles	We recommend development of a STEMI network of care that incorporates the use of prehospital catheterization laboratory activation, single-call patient transfer protocols, and in-field bypass of non-PCI centres to minimize FMC-to-device times for patients who are treated with PPCI.	Forte	Modéré
	Révision	Ententes formelles	We recommend the use of protocols to minimize time to fibrinolysis, and the development of a formal relationship with a PCI centre to enable adjunctive PCI for patients who are treated with fibrinolysis within a STEMI network.	Forte	Modéré
	Nouvelle	Stratégie par défaut	Practical tip. All hospitals within a STEMI network should define their default STEMI reperfusion strategy on the basis of local geography and resource availability.	s. o.	s. o.
	Nouvelle Non modifiée Révision	Stratégie par défaut Seul appel Principe de non-refus	Elements of a regional STEMI network: -A preplanned default initial reperfusion strategy (PPCI or fibrinolysis) for each hospital within the network on the basis of geographic and transport considerations. -The ability to deliver appropriate adjunctive PCI after fibrinolysis. -The capability of EMS and emergency department teams to rapidly diagnose and treat STEMI. -For PPCI, the ability for EMS and emergency departments to activate the STEMI team for reperfusion therapy through a "single call" mechanism immediately from the point of first medical contact with the patient. -The implementation of a "no-refusal" policy at PCI centres for STEMI patients who are deemed appropriate for PPCI. -The ability for EMS teams that diagnose STEMI patients in the field to bypass non-PCI centres and transport patients directly to a PCI centre. -The ability for appropriately selected patients to bypass the emergency department of a PCI centre and proceed directly to the cardiac catheterization laboratory.	s. o.	s. o.
	Nouvelle	Stratégie par défaut (délais)	Total time from FMC to first device activation (for primary PCI); for non-PCI centres or patients diagnosed in the field < 120 minutes; Regional goal: ≥ 75% of cases to achieve target metric.	s. o.	s. o.
	Nouvelle	Stratégie par défaut (délais)	Time from FMC to fibrinolysis < 30 minutes; Regional goal: ≥ 75% of cases to achieve target metric.	s. o.	s. o.
	Nouvelle	Post-fibrinolyse	We recommend routine rapid transfer to PCI centres after fibrinolysis, immediate PCI for patients with failed reperfusion, and routine angiography with or without PCI within 24 hours after successful fibrinolysis.	Forte	Modéré

Lignes directrices ou documents de consensus					
Auteur/Année	Révision ou nouvelle norme	Sujet	Recommandation/Propos	Force de la recommandation	Niveau de preuve
	Nouvelle	Post-fibrinolyse	Clinical trials have defined failed fibrinolysis as a failure to achieve > 50% STsegment resolution in the ECG lead with maximal ST elevation, and/or persistent chest pain or hemodynamic or electrical instability 60-90 minutes after the initiation of fibrinolysis.	s. o.	s. o.
Ibanez *et al.*, 2018	Révision Révision	Ententes formelles Protocoles	The main features of such a network are: Clear definition of geographic areas of responsibility. Shared written protocols, based on risk stratification and transportation by a trained physician, nurse, or paramedic staff in appropriately equipped ambulances or helicopters. Pre-hospital triage of STEMI patients to the appropriate institution, bypassing non-PCI hospitals or hospitals without a 24h a day, 7 days a week (24/7) primary PCI programme. On arrival at the appropriate hospital, the patient should immediately be taken to the catheterization laboratory, bypassing the emergency department. Patients presenting to a non-PCI-capable hospital and awaiting transportation for primary or rescue PCI must be attended in an appropriately monitored and staffed area. If the diagnosis of STEMI has not been made by the ambulance crew and the ambulance arrives at a non-PCI-capable hospital, the ambulance should await the diagnosis and, if a STEMI diagnosis is made, should continue to a PCI-capable hospital	s. o.	s. o.
	Révision	Réseaux	It is recommended that the pre-hospital management of STEMI patients is based on regional networks designed to deliver reperfusion therapy expeditiously and effectively, with efforts made to make primary PCI available to as many patients as possible.	Classe I	B
Collège des médecins du Québec (CMQ), 2020	Révision	Commun-ication, entente	Il doit y avoir communication entre les responsables médicaux des centres référent et receveur pour que l'échange d'informations cliniques ait lieu avant le transfert. Cet échange doit inclure le transfert complet des informations pertinentes (état clinique, paramètres physiologiques, actes posés avant et durant le transport, paramètres de perfusion et ventilation, complications durant le transport).	s. o.	s. o.
	Révision	Ententes formelles	Un médecin ou une personne responsable du centre receveur (ex. : médecin responsable du transport des patients dans l'établissement) doit avoir accepté le transfert du patient avant que le transfert soit en cours (à moins d'une entente explicite conclue entre les établissements impliqués, entente qui n'exclut pas et ne remplace pas la communication des informations pertinentes).	s. o.	s. o.
	Nouvelle	Modalités de transfert interhospitalier	Une politique d'établissement sur les transferts interétablissements et les corridors de service doit être en place et connue des équipes soignantes.	s. o.	s. o.

Lignes directrices ou documents de consensus					
Auteur/Année	Révision ou nouvelle norme	Sujet	Recommandation/Propos	Force de la recommandation	Niveau de preuve
American Heart Association (AHA), 2018	Révision	Protocoles	Coordinating STEMI Care between EMS and STEMI Receiving Center 1. Pre-planned EMS destination protocols 2. Early notification by EMS to the STEMI Receiving Center of suspected or confirmed STEMI patient 3. Early activation of the Cath Lab (STEMI Alert) by the STEMI Receiving Center prior to the arrival of patient with STEMI identified in the field by EMS 4. Immediate, 24-48 hour and quarterly feedback to EMS by the STEMI Receiving Center	s. o.	s. o.
Beygui *et al.*, 2020	Révision	Réseaux, protocoles	The care of STEMI in the prehospital setting should be based on regional STEMI networks. Such networks include one or more hospitals and EMS organizations which have a shared protocol for the choice of reperfusion therapy, adjunctive therapy and patient transfer in order to provide consistent treatment to patients. Such protocols should be formally discussed between all components of the network and be available in writing.	s. o.	s. o.
	Nouvelle	Stratégie par défaut (délais)	Recommended FMC to needle delay: ≤ 30 minutes	s. o.	s. o.

Études observationnelles					
Auteur/Année	Révision ou nouvelle norme	Sujet	Protocole	Résultats	Conclusions
Green *et al.*, 2018	Révision	Protocoles de destination	We identified all patients with STEMI who arrived at the final destination hospital Acute Coronary Treatment and Intervention Outcomes Network (ACTION PCI center) by EMS using ACTION Registry-Get With The Guidelines (ACTION Registry-GWTG) data from January 1, 2013, to December 31, 2014. States that had implemented their policies by 2013 were selected as case states in our analysis. Using a greedy matching algorithm, 6 states with hospital destination policies (cases) were matched to 6 states without hospital destination policies (controls) a priori on region, hospital density, and percent state participation in the registry. We constructed several regression models to isolate the effects of living in states that have adopted hospital destination policies. Our key outcomes were (1) primary PCI within 90 minutes and (2) 120 minutes from FMC and (3) overall receipt of reperfusion therapy.	Rates of prehospital ECG utilization were high, and patients in states with hospital destination policies were more likely to have a prehospital ECG obtained (74.7%) than patients in states without hospital destination policies (68.7%). The time of symptom onset to hospital arrival was no different between the 2 groups, even though patients in states with hospital destination policies received treatment faster from the time of FMC. The median time from symptom onset to hospital arrival was quite lengthy in both groups, 1.5 hours overall with a 25th quartile of 1 hour and a 75th quartile of 2.7 hours. First, patients living in states that have adopted hospital destination policies were significantly more likely to receive timely primary PCI. This time advantage persisted at 90 and 120 minutes from FMC, respectively (odds ratio [OR], 1.59; 95% confidence interval [CI], 1.19–2.12 and OR, 1.44; 95% CI, 1.06–1.95). Second, overall unadjusted rates of receipt of any reperfusion therapy were high at 96.8%, with a trend toward higher use for patients in states with hospital destination policies in the adjusted analysis (OR, 1.77; 95% CI, 0.96–3.24). In	Our study suggests that statewide hospital destination policies for STEMI organized by the state government allow EMS providers to more effectively triage patients to meet guideline recommendations. STEMI patients living in states with statewide hospital destination policies were more likely to receive any reperfusion therapy and were more likely to receive timely PCI than STEMI patients in states without such policies. A key challenge we noted was that a substantial number of patients failed to access EMS or delayed accessing EMS. For example, 27% of potentially eligible (129 968/478 285) STEMI patients in our study self-transported to a hospital, without using EMS. Thus, failure to access EMS identifies yet another objective for process improvement. In our study, time from symptom onset to presentation remained a substantial barrier to timely care in both study groups. This factor is largely influenced by the time it takes for a patient to call EMS. Community health literacy about heart attack symptoms and the importance of calling 9-1-1 remain additional barriers to timely STEMI care. Although statewide EMS mandates for hospital transport of STEMI patients seem to expedite guideline-compliant STEMI care, delay or failure to access EMS remains an important objective for improvement. Our finding that a state-level policy intervention focused on EMS processes improved STEMI care is consistent with prior studies showing that modifying

Études observationnelles					
Auteur/Année	Révision ou nouvelle norme	Sujet	Protocole	Résultats	Conclusions
				summary, living in a state with a statewide prehospital plan for EMS transport of STEMI patients is associated with faster treatment times. After adjustment for patient- and state-level characteristics, 57.9% (95% CIs, 53.2%–62.5%) of patients living in states with hospital destination policies when compared with 47.5% (95% CIs, (43.4%–51.7%) living in states without hospital destination policies received primary PCI within their relevant guideline-recommended time from FMC.	EMS processes can improve STEMI care without increasing the number of PCI providing centers.
Jollis *et al.*, 2018	Révision	Réseaux, protocoles	The Accelerator-2 project organized ST-segment– elevation myocardial infarction care, with systematic implementation of processes outlined in the American Heart Association Mission: Lifeline program, in 12 metropolitan regions across the United States. The Accelerator-2 project was conducted between April 2015 and March 2017. Twelve regions that met 1 of 2 sets of criteria were selected. The first set of criteria was for regions that had not fully implemented regional STEMI plans but had the potential to do so based on (1) willingness to participate in the National Cardiovascular Data Registry's ACTION (Acute Coronary Treatment and Intervention Outcomes Network) Registry-Get With The Guidelines (AR-G) program; (2) engagement of	Symptom onset to FMC was 50 minutes in both the baseline and final quarters. There were significant reductions in time to treatment, including the proportion of patients with FMC to catheterization laboratory activation time ≤20 minutes (38% baseline, 56% final; P<0.0001), the proportion spending ≤20 minutes in the ED (33% baseline, 43% final; P<0.0001), and the proportion of patients treated within 90 minutes of FMC (67% baseline, 74% final; P<0.002). Nine of the 12 regions had an increase in the proportion of patients treated within 90 minutes, and 8 regions achieved the national Mission: Lifeline goal of at least 75% of patients treated within 90 minutes by the end of the	Organization of care among EMS and hospitals in 12 regions was associated with significant reductions in time to reperfusion in patients with ST-segment–elevation myocardial infarction as well as in in-hospital mortality. There were reductions in every time interval analyzed, reflecting increased coordination between EMS providers, ED physicians, cardiologists, and catheterization laboratory staff. The improvements in treatment times were accompanied by statistically significant reductions in hospital mortality and development of heart failure. Our efforts focused on patients transported by EMS providers to PCI-capable hospitals, and the key elements of our intervention included prehospital activation of catheterization laboratories and bypassing EDs whenever appropriate, prespecified treatment protocols, measurement and feedback

Études observationnelles					
Auteur/Année	Révision ou nouvelle norme	Sujet	Protocole	Résultats	Conclusions
			recognized regional leadership; (3) willingness to develop and ratify common protocols across the region for the diagnosis and treatment of patients with STEMI; (4) formal agreement to enter patients into AR-G during the study period; and (5) commitment of regional leadership to participate in a 2-day national training session directed by study faculty reviewing current evidence, guidelines, and best practice approaches to regional STEMI care. The second set of criteria was for regions that had participated in the STEMI Accelerator-1 program or had potential for expansion and further improvement with continued participation. The primary analysis was the change in the proportion of patients meeting the goal of first medical contact (FMC) to device between the baseline and final quarters. Secondary analyses included changes in additional processes of care evaluated each quarter, including FMC to cardiac catheterization laboratory arrival, ED dwell time, and changes in in-hospital complications and death. Baseline and final quarters were prospectively specified at the hospital level, with baseline defined as the first full quarter of data collection before study intervention, and final defined as the last full quarter of data collection under project coordination.	study. Of the 3 regions that did not improve, 2 were already meeting the Mission: Lifeline goal of 75% treated within 90 minutes of FMC in the baseline quarter, and 1 region had a decline in performance in this measure. Hospitals not participating in the Accelerator-2 project had no change in the proportion of patients treated within 90 minutes of FMC (72.2%–72.1%, P=0.91). Among patients brought to PCI-capable centers by EMS, in-hospital mortality fell from 4.4% to 2.3% (P=0.001) and heart failure as a complication fell from 7.4% to 5.0% (P=0.031) between the baseline and final quarters. Other complications developing after admission, including stroke, cardiogenic shock, and major bleeding, were unchanged. After adjusting for demographic and clinical characteristics, the mortality improvement remained statistically significant (adjusted odds ratio, 2.16; 95% confidence interval, 1.17–3.99; P=0.013).	in regional reports, broad regional leadership to support these activities, and ongoing implementation and quality improvement efforts by a dedicated regional coordinator. Our intervention relied on EMS providers' interpretation of ECGs, assisted by computer algorithm interpretation, and transmission in cases of uncertainty. Our approach to increase the acceptance of prehospital activation included dedicated training of EMS providers in ECG interpretation and identification of STEMI to improve accuracy, establishing agreed-on criteria for obvious STEMI diagnosis within each region, support from machine interpretation algorithms and transmission when ECGs were questionable, ongoing case review between physicians and EMS providers, and encouragement of prehospital activation by interventional cardiology leadership. We monitored the performance of hospitals in preactivation by using time from ED arrival to arrival in the catheterization laboratory (ED dwell times), with shorter times indicating catheterization laboratories were activating before patient hospital arrival. With the collection of a new catheterization laboratory activation time data element, we identified a corresponding strong association between activating the laboratory within 20 minutes and lower mortality, further supporting the case for prehospital diagnosis of STEMI and immediate (prehospital) activation of the catheterization laboratory team.

Études observationnelles					
Auteur/Année	Révision ou nouvelle norme	Sujet	Protocole	Résultats	Conclusions
			The project was conducted with development of regional leadership, common protocols, and data measurement and feedback in quarterly reports. Grant funds were allocated to hire a full-time coordinator for each region who was not affiliated with any individual hospital. These coordinators had a variety of backgrounds in public health, quality improvement, nursing and paramedic experience, and statistics. Coordinators were selected and used by the local American Heart Association (AHA) affiliate according to experience in public health or emergency cardiovascular care, strong interpersonal skills, enthusiastic leadership, and ability to understand data and implement process improvement in collaboration with regional health care professionals and the Duke Clinical Research Institute study team. Funds were also allocated to provide at least 2 faculty mentors for each region throughout the project. Faculty mentors included nurses, paramedics, and physicians with expertise in organizing regional STEMI care. The mentorship pair conducted an on-site strategic assessment of current STEMI care in each region before the study intervention.		If other regions wish to implement systems similar to that described above for the Accelerator-2 project, the required elements beyond existing hospital and EMS resources include (1) a willingness of hospitals, physicians, and EMS agencies to collaborate, establish common protocols, and share data; (2) participation in a registry that measures processes and outcomes from initial system contact through hospital care; (3) local leadership that spans multiple institutions and healthcare disciplines willing to meet on a regular basis to design and direct the system (commonly 2–3 hours per month to support conference calls, quarterly data meetings, hospital visits, and focused EMS provider training programs); (4) a regional coordinator with funding shared by participating PCI-capable hospitals and health systems or grant mechanisms; and (5) meeting space provided by regional hospitals and EMS agencies on a rotating basis. This small infrastructure added to the significant resources dedicated to cardiovascular care at the individual hospital level has the potential to expedite care and improve outcomes for patients with acute coronary syndrome across entire regions.
Bainey *et al.*, 2019	Nouvelle	Post-fibrinolyse	A regional reperfusion protocol in northern Alberta (Canada), the Vital Heart Response (VHR) Program	The pharmacoinvasive approach was administered in 1805 patients (54.9%), (493	For the first time, in a large comprehensive Canadian ST-segment elevation myocardial infarction registry

Études observationnelles					
Auteur/Année	Révision ou nouvelle norme	Sujet	Protocole	Résultats	Conclusions
			was established in 2006 to implement evidence-based guidelines and to deliver expeditious reperfusion therapy for STEMI patients. A linked quality assurance registry tracks all STEMI patients admitted to any of the 5 Edmonton (Alberta, Canada) zone hospitals including 2 tertiary care cardiac catheterization centers and 3 community hospitals (within 12 miles from a PCI-capable hospital). Patients transferred from other community hospitals to the Edmonton referral region were also included. The VHR program includes a prehospital dual reperfusion strategy where patients in the ambulance can receive fibrinolysis (absolute contraindications reviewed) or be directed for pPCI at a PCI hospital at the discretion of the physician who interprets ambulance ECGs on a mobile device. In patients receiving fibrinolysis in the ambulance, most are diverted to a PCI-capable hospital for assessment of reperfusion success. Although contemporary guidelines for STEMI patients recommend pPCI as the preferred reperfusion strategy, a large portion of northern Alberta patients receive fibrinolytic treatment at non-PCI capable hospitals because of recognized delays in achieving timely metrics. Primary PCI is performed when first medical contact (FMC) to device time of 90 to 120 minutes can be achieved. With a pharmacoinvasive approach, the	[27.3%] underwent rescue/urgent percutaneous coronary intervention and 1312 [72.7%] had scheduled angiography); pPCI was performed in 1482 patients (45.1%). There was greater ST-segment resolution post-catheterization/percutaneous coronary intervention with a pharmacoinvasive strategy versus pPCI (75.8% versus 64.3%, IP-weighted odds ratio, 1.59; 95% CI, 1.33–1.90; P<0.001). The primary composite was significantly lower with a pharmac-oinvasive approach (16.3% versus 23.1%, IP-weighted hazard ratio, 0.84; 95% CI, 0.72–0.99; P=0.033). A pharmacoinvasive approach compared with pPCI was associated with a nearly 20% lower hazard of the primary composite of death, CHF, cardiogenic shock, and recurrent MI within 1 year. Major bleeding and intracranial hemorrhage were similar between a pharmaco-invasive strategy and pPCI (7.6% versus 7.5%, P=0.867; 0.6% versus 0.6%; P=0.841, respectively). Major bleeding events were not different in those receiving a pharmaco-invasive approach compared with pPCI (7.6% versus 7.5%, P=0.867) within 1 year. Similarly, no difference in ICH was observed recognizing	comparing 2 contemporary guideline recommended reperfusion strategies, namely pharmacoinvasive treatment (adopting half-dose tenecteplase in the elderly) versus primary percutaneous coronary intervention, we have demonstrated improved reperfusion, as measured by the electrocardiogram (core-laboratory), accompanied by enhanced clinical outcome within 1-year followup for those receiving pharmacoinvasive therapy. Reassuringly, no difference in major bleeding or intracranial hemorrhage was observed within 1 year. Our findings support a selective pharmacoinvasive reperfusion strategy in ST-segment elevation myocardial infarction, particularly when delays to primary percutaneous coronary intervention exists.

Études observationnelles					
Auteur/Année	Révision ou nouvelle norme	Sujet	Protocole	Résultats	Conclusions
			need for rescue intervention is based on <50% ST-segment elevation resolution on the worst lead 90 minutes after TNK. Urgent angiography is performed when hemodynamic instability, refractory ventricular arrhythmias, ongoing ischemic chest pain, or recurrent ST-segment elevation occurs. Otherwise, those with successful reperfusion are scheduled routinely for cardiac catheterization nonurgently. The pharmacoinvasive patients were further categorized according to whether they required rescue/urgent cardiac catheterization or had scheduled angiography (aim for within 24 hours).	the implementation of half-dose TNK in the elderly prehospital patients in April 2013 (0.6% versus 0.6%, P=0.841). In the 82 patients ≥75 years with a prehospital pharmaco-invasive strategy, similar ST-segment resolution and rescue rates were observed with full-dose versus half-dose tenecteplase (75.8% versus 88.9%, P=0.259; 31.0% versus 29.2%, P=0.867) with no difference in the primary composite (31.0% versus 25.0%, P=0.585). A pharmacoinvasive strategy, as compared with pPCI, was associated with a reduction in the in-hospital composite outcome (IP-weighted OR, 0.80; 95% CI, 0.66–0.98; P=0.029). - Compared with pPCI, a scheduled pharmacoinvasive strategy was associated with lower likelihood of these in-hospital events (IP-weighted OR, 0.72; 95% CI, 0.58–0.90; P=0.004). Compared with pPCI, pharmacoinvasive patients were younger, less often female, and heavier (greater body mass index) but had a lower baseline heart rate. Pharmacoinvasive patients were less likely to have a history of hypertension and atrial fibrillation but were more	

Études observationnelles					
Auteur/Année	Révision ou nouvelle norme	Sujet	Protocole	Résultats	Conclusions
				commonly active smokers and had a premature history of coronary artery disease. A high use of evidence-based medications in the acute setting were noted with both groups. Infarct location was more commonly inferior (as opposed to anterior) in pharmacoinvasive patients, and these patients had a shorter symptom onset to FMC and shorter symptom onset to treatment (administration of any reperfusion therapy). PCI-related delay (defined as the difference between symptom onset to treatment between reperfusion strategies) was 84 minutes. Symptom onset to treatment >3 hours was substantially less in the pharmacoinvasive patients. Compared with pPCI, pharmacoinvasive patients had similar symptom onset to baseline ECG (ie, total ischemic time before the reperfusion decision) with similar ST-segment elevation but greater sum ST-segment deviation. Compared with pPCI, pharmacoinvasive patients had shorter baseline ECG to treatment time (63 minutes). Following the initiation of acute reperfusion therapy (≈30 minutes after pPCI or ≈90 minutes after TNK alone), residual ST-elevation was	

Études observationnelles					
Auteur/Année	Révision ou nouvelle norme	Sujet	Protocole	Résultats	Conclusions
				higher in patients receiving TNK (P<0.001) with less ST-segment resolution compared with pPCI (P<0.001), largely due to the higher residual ST-elevation with less ST-segment resolution seen in rescue/scheduled patients. However, after cardiac catheterization±PCI (≈30 minutes following primary PCI or ≈30 minutes following a pharmacoinvasive approach), residual ST-elevation was higher in pPCI with less ST-segment resolution. The pharmacoinvasive strategy was associated with improved ST-segment resolution after cardiac catheterization (IP-weighted OR, 1.59; 95% CI, 1.33–1.90; P<0.001). When compared with pPCI, both scheduled and rescue/urgent strategies were associated with improved sum ST-segment deviation resolution ≥50% after cardiac catheterization.	

Tableau D-5 Grille d'extraction de données sur l'amélioration de la qualité

Lignes directrices ou documents de consensus					
Auteur/Année	Révision ou nouvelle norme	Sujet	Recommandation/Propos	Force de la recommandation	Niveau de preuve
Wong *et al.*, 2019	Révision	Évaluation	We recommend that hospitals and EMS services within STEMI networks maintain written, updated STEMI management protocols, and audit treatment delays, reperfusion rates, and false activation rates to monitor quality metrics.	Forte	Faible
Ibanez *et al.*, 2018	Révision	Évaluation	To reduce this gap and improve quality of care, it is recommended that STEMI networks and their individual components establish measurable quality indicators, systems to measure and compare these indicators, perform routine audits, and implement strategies to ensure that every patient with STEMI receives the best possible care according to accepted standards and has the best possible outcomes. The quality of care, time delays, and patient outcomes should be measured and compared at regular intervals for improvement.	s. o.	s. o.
	Révision	Évaluation	It is recommended that all hospitals and EMS participating in the care of patients with STEMI record and audit delay times and work to achieve and maintain quality targets.	Classe I	C
NICOR, 2019	Révision	Évaluation	Hospitals not reaching the current national or BCIS DTB standards should undertake a clinical pathway process review and identify areas where delays can be avoided. Advice should be sought from centres where such work has resulted in the meeting of the current standards.	s. o.	s. o.

Études observationnelles					
Auteur/Année	Révision ou nouvelle norme	Sujet	Protocole	Résultats	Conclusions
Granger *et al.*, 2019	Révision Révision	Fréquence d'évaluation Évaluation	Tools were provided on the Mission: Lifeline website for addressing each of the points of entry (EMS, non–PCI-capable hospitals, PCI-capable hospitals, and the system) and for coordinating them, including protocols, clear lines of communication, and measurement and timely feedback. Regular (monthly) meetings of interdisciplinary teams are recommended, including EMS, nursing, emergency medicine and cardiology physicians, quality improvement experts, and hospital administrators. Regular webinars were provided. Reports were provided to each hospital, and regional reports that included groups	There was a decrease in the proportion of eligible patients not treated with reperfusion (6.2% versus 3.3%) and treated with fibrinolytic therapy (13.4% versus 7.0%). Median time from symptom onset to first medical contact was unchanged (%50 minutes). Use of prehospital ECGs increased (45% versus 71%). All major reperfusion times improved: median first medical contact-to-device for emergency medical systems transport to percutaneous coronary intervention–capable hospitals (93 to 84 minutes), first door-to-device for transfers for primary	We have demonstrated that there were substantial improvements in care for patients with STEMI during the first 5 years of the Mission: Lifeline program across the entire system of care. There was a 26% absolute increase in the use of prehospital ECGs by EMS. There was an increase in the use of primary PCI, including a 28% absolute increase in primary PCI among patients transferred from non–PCI-capable hospitals. There was nearly a 50% reduction in patients not treated with reperfusion therapy. At the same time, times to reperfusion were shortened, particularly times that

Études observationnelles					
Auteur/Année	Révision ou nouvelle norme	Sujet	Protocole	Résultats	Conclusions
			of hospitals in specified regions were available to assess performance and progress. These regional activities were supported by local leaders and AHA staff.	percutaneous coronary intervention (130 to 112 minutes), and doorin–door-out at non–percutaneous coronary intervention–capable hospitals (76 to 62 minutes) (all P<0.001 over 5 years). Rates of cardiogenic shock and cardiac arrest, and overall in-hospital mortality increased (5.7% to 6.3%). Adjusted mortality excluding patients with known cardiac arrest decreased by 14% at 3 years and 25% at 5 years (P<0.001).	reflect the performance of the system: median FMC-to-device time for patients directly transported by EMS dropped from 93 to 84 minutes, and first door-to-device time for transfer patients dropped from 130 to 112 minutes. Median door-to-device time for all patients presenting to PCI capable hospitals improved from 68 to 59 minutes, with 75% achieving door-to-device times within 75 minutes. Thus, for patients presenting to PCI-capable hospitals in the Mission: Lifeline program, the problem of delays in door-to-device time has been solved.
Jollis *et al.*, 2018	Révision Révision	Fréquence d'évaluation Évaluation	The Accelerator-2 project organized ST-segment– elevation myocardial infarction care, with systematic implementation of processes outlined in the American Heart Association Mission: Lifeline program, in 12 metropolitan regions across the United States. The Accelerator-2 project was conducted between April 2015 and March 2017. Twelve regions that met 1 of 2 sets of criteria were selected. The first set of criteria was for regions that had not fully implemented regional STEMI plans but had the potential to do so based on (1) willingness to participate in the National Cardiovascular Data Registry's ACTION (Acute Coronary Treatment and Intervention Outcomes Network) Registry-Get With The Guidelines (AR-G) program; (2) engagement of recognized regional leadership; (3) willingness to develop and ratify common protocols	Symptom onset to FMC was 50 minutes in both the baseline and final quarters. There were significant reductions in time to treatment, including the proportion of patients with FMC to catheterization laboratory activation time ≤20 minutes (38% baseline, 56% final; P<0.0001), the proportion spending ≤20 minutes in the ED (33% baseline, 43% final; P<0.0001), and the proportion of patients treated within 90 minutes of FMC (67% baseline, 74% final; P<0.002). Nine of the 12 regions had an increase in the proportion of patients treated within 90 minutes, and 8 regions achieved the national Mission: Lifeline goal of at least 75% of patients treated within 90 minutes by the end of the study. Of the 3 regions that did not improve, 2 were already meeting the Mission:	Organization of care among EMS and hospitals in 12 regions was associated with significant reductions in time to reperfusion in patients with ST-segment–elevation myocardial infarction as well as in in-hospital mortality. There were reductions in every time interval analyzed, reflecting increased coordination between EMS providers, ED physicians, cardiologists, and catheterization laboratory staff. The improvements in treatment times were accompanied by statistically significant reductions in hospital mortality and development of heart failure. Our efforts focused on patients transported by EMS providers to PCI-capable hospitals, and the key elements of our intervention included prehospital activation of catheterization laboratories and bypassing EDs whenever

Études observationnelles					
Auteur/Année	Révision ou nouvelle norme	Sujet	Protocole	Résultats	Conclusions
			across the region for the diagnosis and treatment of patients with STEMI; (4) formal agreement to enter patients into AR-G during the study period; and (5) commitment of regional leadership to participate in a 2-day national training session directed by study faculty reviewing current evidence, guidelines, and best practice approaches to regional STEMI care. The second set of criteria was for regions that had participated in the STEMI Accelerator-1 program or had potential for expansion and further improvement with continued participation. The primary analysis was the change in the proportion of patients meeting the goal of first medical contact (FMC) to device between the baseline and final quarters. Secondary analyses included changes in additional processes of care evaluated each quarter, including FMC to cardiac catheterization laboratory arrival, ED dwell time, and changes in in-hospital complications and death. Baseline and final quarters were prospectively specified at the hospital level, with baseline defined as the first full quarter of data collection before study intervention, and final defined as the last full quarter of data collection under project coordination. The project was conducted with development of regional leadership, common protocols, and data measurement and feedback in quarterly reports. Grant funds were allocated to hire a full-time coordinator for each region	Lifeline goal of 75% treated within 90 minutes of FMC in the baseline quarter, and 1 region had a decline in performance in this measure. Hospitals not participating in the Accelerator-2 project had no change in the proportion of patients treated within 90 minutes of FMC (72.2%–72.1%, P=0.91). Among patients brought to PCI-capable centers by EMS, in-hospital mortality fell from 4.4% to 2.3% (P=0.001) and heart failure as a complication fell from 7.4% to 5.0% (P=0.031) between the baseline and final quarters. Other complications developing after admission, including stroke, cardiogenic shock, and major bleeding, were unchanged. After adjusting for demographic and clinical characteristics, the mortality improvement remained statistically significant (adjusted odds ratio, 2.16; 95% confidence interval, 1.17–3.99; P=0.013).	appropriate, prespecified treatment protocols, measurement and feedback in regional reports, broad regional leadership to support these activities, and ongoing implementation and quality improvement efforts by a dedicated regional coordinator. Our intervention relied on EMS providers' interpretation of ECGs, assisted by computer algorithm interpretation, and transmission in cases of uncertainty. Our approach to increase the acceptance of prehospital activation included dedicated training of EMS providers in ECG interpretation and identification of STEMI to improve accuracy, establishing agreed-on criteria for obvious STEMI diagnosis within each region, support from machine interpretation algorithms and transmission when ECGs were questionable, ongoing case review between physicians and EMS providers, and encouragement of prehospital activation by interventional cardiology leadership. We monitored the performance of hospitals in preactivation by using time from ED arrival to arrival in the catheterization laboratory (ED dwell times), with shorter times indicating catheterization laboratories were activating before patient hospital arrival. With the collection of a new catheterization laboratory activation time data element, we identified a corresponding strong association between activating the laboratory

Études observationnelles					
Auteur/Année	Révision ou nouvelle norme	Sujet	Protocole	Résultats	Conclusions
			who was not affiliated with any individual hospital. These coordinators had a variety of backgrounds in public health, quality improvement, nursing and paramedic experience, and statistics. Coordinators were selected and used by the local American Heart Association (AHA) affiliate according to experience in public health or emergency cardiovascular care, strong interpersonal skills, enthusiastic leadership, and ability to understand data and implement process improvement in collaboration with regional health care professionals and the Duke Clinical Research Institute study team. Funds were also allocated to provide at least 2 faculty mentors for each region throughout the project. Faculty mentors included nurses, paramedics, and physicians with expertise in organizing regional STEMI care. The mentorship pair conducted an on-site strategic assessment of current STEMI care in each region before the study intervention.		within 20 minutes and lower mortality, further supporting the case for prehospital diagnosis of STEMI and immediate (prehospital) activation of the catheterization laboratory team. The most challenging but critical element of our intervention involved the ongoing collection of common data elements that spanned the entire episode of care from EMS arrival to hospital discharge. Each participating hospital was asked to collect data into AR-G, and these data populated quarterly Mission: Lifeline regional reports. These reports were used to monitor hospital performance in comparison with regional competitors in a deidentified blinded fashion and to guide system improvement. If other regions wish to implement systems similar to that described above for the Accelerator-2 project, the required elements beyond existing hospital and EMS resources include (1) a willingness of hospitals, physicians, and EMS agencies to collaborate, establish common protocols, and share data; (2) participation in a registry that measures processes and outcomes from initial system contact through hospital care; (3) local leadership that spans multiple institutions and healthcare disciplines willing to meet on a regular basis to design and direct the system (commonly 2–3 hours per month to support conference calls, quarterly data

Études observationnelles					
Auteur/Année	Révision ou nouvelle norme	Sujet	Protocole	Résultats	Conclusions
					meetings, hospital visits, and focused EMS provider training programs); (4) a regional coordinator with funding shared by participating PCI-capable hospitals and health systems or grant mechanisms; and (5) meeting space provided by regional hospitals and EMS agencies on a rotating basis. This small infrastructure added to the significant resources dedicated to cardiovascular care at the individual hospital level has the potential to expedite care and improve outcomes for patients with acute coronary syndrome across entire regions.
Scholz *et al.*, 2020	Révision	Évaluation	Regular interactive feedback sessions with local STEMI management teams were performed at six participating German percutaneous coronary intervention (PCI) centers over a 10-year period starting from October 2007. The study protocol includes the implementation of a standardized feedback-driven quality management initiative for timely reperfusion therapy in regional cardiac care networks for the treatment of STEMI patients. Enrollment in the FITT-STEMI study consortium requires participating PCI-capable hospitals to prospectively collect data on treatment times and performance measurements of all consecutive patients presenting within 24 hours of symptom onset of STEMI.	From the first to the 10th year of study participation, all predefined key-quality indicators for performance measurement used for feedback improved significantly in all 4926 consecutive PCI-treated patients: - percentages of patients with pre-hospital ECG recordings (83.3% vs 97.1%, $p < 0.0001$) - ECG recordings within 10 minutes after first medical contact (41.7% vs 63.8%, $p < 0.0001$) - pre-announcement by telephone (77.0% vs 85.4%, $p = 0.0007$) - direct transfer to the catheterization laboratory bypassing the emergency department (29.4% vs 64.2%, $p < 0.0001$) - contact-to-balloon times of less than 90 minutes (37.2% vs 53.7%, $p < 0.0001$).	Our results indicate that systematic data assessment and regular feedback is a feasible long-term strategy and may be linked to improved performance and a reduction in mortality in STEMI management.

Études observationnelles					
Auteur/Année	Révision ou nouvelle norme	Sujet	Protocole	Résultats	Conclusions
			In addition to time intervals of the treatment chain, procedural data were obtained. All data were presented and discussed during regular feedback meetings with members of the participating interdisciplinary treatment teams at each local study site, as described earlier. The feedback sessions were organized by the local principal investigator at each study center. In the first year after study entrance, meetings were performed quarterly and from the second year after joining the FITT-STEMI consortium annually.	Feedback-related continuous improvement of key-quality indicators was linked to a significant reduction in in-hospital mortality from 10.8% to 6.8% (p = 0.0244). Logistic regression models confirmed an independent beneficial effect of duration of study participation on hospital mortality (odds ratio = 0.986, 95% confidence interval = 0.976–0.996, p = 0.0087). In contrast, data from a nationwide PCI registry showed a continuous increase in in-hospital mortality in all PCI-treated STEMI patients in Germany from 2008 to 2015 (n = 398,027; 6.7% to 9.2%, p < 0.0001).	
Candiello *et al.*, 2020	Révision	Évaluation	This was an observational, prospective study conducted in 46 centers with 24/7 pPCI capability participating in the Stent-Save a Life! Argentina Initiative. Patients with STEMI who underwent pPCI within 12 hours from the onset of symptoms were included from March 2016 to February 2019. The population was divided into three consecutive stages lasting one year each since the inclusion of each center in the Stent-Save a Life! Initiative. Each center received a monthly global report comparing in a blind fashion its DTB time with that of the other centers, together with an individual report describing the times to treatment according to FMC with suggestions to improve them.	There was a significant reduction in door-to-balloon (DTB) time (68, 60 and 50 min; p <0.0001), regardless of the type of first medical contact (FMC), and of the time from FMC to reperfusion (115, 112 and 98 min; p <0.0001), without differences in time from the onset of symptoms to FMC or total ischemic time (TIT). In addition, patients with FMC in centers without PCI capability who were referred for pPCI also evidenced a significant reduction of TIT (274, 260 and 235 min; p <0.001).	The implementation of a DTB program in centers with pPCI capability resulted in a significant reduction of treatment times.

Études observationnelles					
Auteur/Année	Révision ou nouvelle norme	Sujet	Protocole	Résultats	Conclusions
			A total of 3,492 patients were included (1st year: 1,482, 2nd year: 1,166, 3rd year: 844).		

ANNEXE E

Gradation de la preuve par les lignes directrices incluses

Wong *et al.*, 2019 (Canadian Cardiovascular Society/Canadian Association of Interventional Cardiology) :

The strength of a recommendation was classified as Strong (desirable effects clearly outweigh undesirable effects or clearly do not) or Weak.

The quality of the evidence was classified as:

High (further research very unlikely to change confidence in the estimate of effect),

Moderate (further research could have an important impact on confidence in the estimate of effect and may change the estimate),

Low (further research very likely to have an important impact on confidence in the estimate of effect and likely to change the estimate) or

Very Low (estimate of the effect very uncertain).

Ibanez *et al.*, 2018 (European Society of Cardiology) :

Classes of recommendations	Definition	Suggested wording to use
Class I	Evidence and/or general agreement that a given treatment or procedure is beneficial, useful, effective.	Is recommended/is indicated
Class II	Conflicting evidence and/or a divergence of opinion about the usefulness/efficacy of the given treatment or procedure.	
Class IIa	*Weight of evidence/opinion is in favour of usefulness/efficacy.*	Should be considered
Class IIb	*Usefulness/efficacy is less well established by evidence/opinion.*	May be considered
Class III	Evidence or general agreement that the given treatment or procedure is not useful/effective, and in some cases may be harmful.	Is not recommended

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Level of evidence A	Data derived from multiple randomized clinical trials or meta-analyses.
Level of evidence B	Data derived from a single randomized clinical trial or large non-randomized studies.
Level of evidence C	Consensus of opinion of the experts and/or small studies, retrospective studies, registries.

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Pilarczyk *et al.*, 2020 (German Guideline Working Group of Medical Scientific Societies) :

Table 2 Level of evidence (LOE)

Level of evidence		Description
1	++	High-quality meta-analyses, systematic reviews of randomized controlled trials (RCTs), or RCTs with a very low risk of bias.
	+	Well-conducted meta-analyses, systematic reviews, or RCTs with a low risk of bias.
2	++	High-quality systematic reviews of case–control or cohort studies. High-quality case–control or cohort studies with a very low risk of confounding or bias and a high probability that the relationship is causal.
	+	Well-conducted case–control or cohort studies with a low risk of confounding or bias and a moderate probability that the relationship is causal.
3		Analytic studies without a concurrent comparison group, e.g., before-and-after studies, interrupted time series nonanalytic studies, e.g., case reports, case series.
4		Expert opinion (EO), e.g., editorial commentaries, guidelines without a clear methodology.

Table 3 Grade of recommendation (GoR)

GoR	Description
↑↑	Strongly recommended: "shall" (usually based on studies with evidence level 1 + + or 1 +)
↑	Recommended: "should" (usually based on studies with evidence level 2 + + or 2 +)
↔	No recommendation: "may" (no confirmed study results exist that demonstrate either a beneficial or a harmful effect).
↓	Rejected: "should not" (negative recommendation).
↓↓	Strongly rejected: "shall not" (strong negative recommendation).

RÉFÉRENCES

Alrawashdeh A, Nehme Z, Williams B, Stub D. Emergency medical service delays in ST-elevation myocardial infarction: A meta-analysis. Heart 2020;106(5):365-73.

American Heart Association (AHA). Mission Lifeline® Data Through The Years (2010-2016) [site Web]. Dallas, TX : AHA; 2018. Disponible à : https://www.heart.org/en/professional/quality-improvement/mission-lifeline/mission-lifeline-data.

Bainey KR, Armstrong PW, Zheng Y, Brass N, Tyrrell BD, Leung R, et al. Pharmacoinvasive strategy versus primary percutaneous coronary intervention in ST-elevation myocardial infarction in clinical practice: Insights from the Vital Heart Response Registry. Circ Cardiovasc Interv 2019;12(10):e008059.

Beygui F, Castren M, Brunetti ND, Rosell-Ortiz F, Christ M, Zeymer U, et al. Pre-hospital management of patients with chest pain and/or dyspnoea of cardiac origin. A position paper of the Acute Cardiovascular Care Association (ACCA) of the ESC. Eur Heart J Acute Cardiovasc Care 2020;9(1_suppl):59-81.

Bussières S, Bégin F, Leblanc PA, Tanguay A, Paradis JM, Hébert D, Fleet R. Clinical adverse events in prehospital patients with ST-elevation myocardial infarction transported to a percutaneous coronary intervention centre by basic life support paramedics in a rural region. CJEM 2018;20(6):857-64.

Candiello A, Cohen F, Lasave L, Villagra L, Mulinaris G, Zoni CR, et al. Impact of an evaluation system of times to reperfusion in ST-segment elevation acute myocardial infarction. Argentine Journal of Cardiology 2020;88(1):32-8.

Collège des médecins du Québec (CMQ). Le transfert interétablissements – Prise en charge et sécurité des patients. Guide d'exercice. Montréal, Qc : CMQ; 2020. Disponible à : http://www.cmq.org/publications-pdf/p-1-2020-08-25-fr-transfert-interetablissements-prise-en-charge-et-securite-des-patients.pdf.

Froats M, Reed A, Dionne R, Maloney J, Duncan S, Burns R, et al. The safety of bypass to percutaneous coronary intervention facility by basic life support providers in patients with ST-elevation myocardial infarction in prehospital setting. J Emerg Med 2018;55(6):792-8.

Granger CB, Bates ER, Jollis JG, Antman EM, Nichol G, O'Connor RE, et al. Improving care of STEMI in the United States 2008 to 2012. J Am Heart Assoc 2019;8(1):e008096.

Green JL, Jacobs AK, Holmes D, Chiswell K, Blanco R, Bates ER, et al. Taking the reins on systems of care for ST-segment-elevation myocardial infarction patients: A report from the American Heart Association Mission: Lifeline Program. Circ Cardiovasc Interv 2018;11(5):e005706.

Ibanez B, James S, Agewall S, Antunes MJ, Bucciarelli-Ducci C, Bueno H, et al. 2017 ESC Guidelines for the management of acute myocardial infarction in patients presenting with ST-segment elevation: The Task Force for the management of acute myocardial infarction in patients presenting with ST-segment elevation of the European Society of Cardiology (ESC). Eur Heart J 2018;39(2):119-77.

Jollis JG, Al-Khalidi HR, Roettig ML, Berger PB, Corbett CC, Doerfler SM, et al. Impact of regionalization of ST-segment-elevation myocardial infarction care on treatment times and outcomes for emergency medical services-transported patients presenting to hospitals with percutaneous coronary intervention: Mission: Lifeline Accelerator-2. Circulation 2018;137(4):376-87.

Kwong JL, Ross G, Turner L, Olynyk C, Cheskes S, Thurston A, Verbeek PR. Evaluation of a primary care paramedic STEMI bypass guideline. CJEM 2018;20(6):850-6.

Mitchell S, Dionne R, Maloney J, Austin M, Mok G, Sinclair J, et al. Safety and clinically important events in PCP-initiated STEMI bypass in Ottawa. CJEM 2018;20(6):865-73.

National Association of State EMS Officials (NASEMSO). National Model EMS Clinical Guidelines. Version 2.2. Falls Church, VA : NASEMSO; 2019. Disponible à : https://nasemso.org/wp-content/uploads/National-Model-EMS-Clinical-Guidelines-2017-PDF-Version-2.2.pdf.

National Institute for Cardiovascular Outcomes Research (NICOR). 2019 NCAP Annual Report. Improving cardiovascular outcomes: Timely, specialist, evidence-based care. Londres, Angleterre : NICOR; 2019. Disponible à : https://www.nicor.org.uk/wp-content/uploads/2019/09/NCAP-Annual-Report-2019-final.pdf.

Pilarczyk K, Werdan K, Russ M, Thiele H, Michels G, Boeken U, Thielmann M. The German-Austrian S3 guideline "Cardiogenic shock due to myocardial infarction: diagnosis, monitoring, and treatment". Thorac Cardiovasc Surg 2020 [Epub ahead of print].

Scholz KH, Lengenfelder B, Jacobshagen C, Fleischmann C, Moehlis H, Olbrich HG, et al. Long-term effects of a standardized feedback-driven quality improvement program for timely reperfusion therapy in regional STEMI care networks. Eur Heart J Acute Cardiovasc Care 2020 [Epub ahead of print].

Scholz KH, Maier SKG, Maier LS, Lengenfelder B, Jacobshagen C, Jung J, et al. Impact of treatment delay on mortality in ST-segment elevation myocardial infarction (STEMI) patients presenting with and without haemodynamic instability: Results from the German prospective, multicentre FITT-STEMI trial. Eur Heart J 2018;39(13):1065-74.

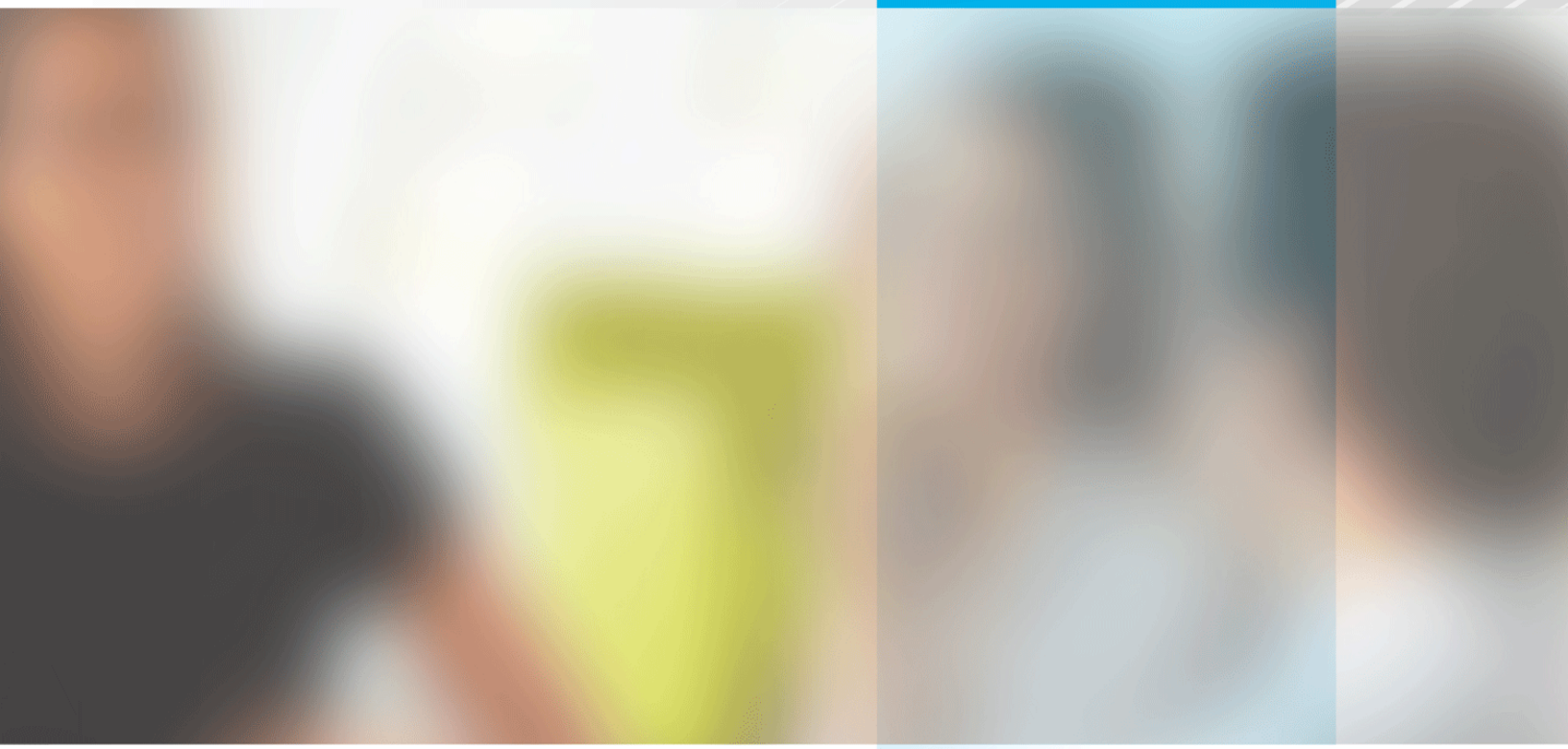
Shavadia JS, Roe MT, Chen AY, Lucas J, Fanaroff AC, Kochar A, et al. Association between cardiac catheterization laboratory pre-activation and reperfusion timing metrics and outcomes in patients with ST-segment elevation myocardial infarction undergoing primary percutaneous coronary intervention: A report from the ACTION registry. JACC Cardiovasc Interv 2018;11(18):1837-47.

Tanguay A, Lebon J, Lau L, Hébert D, Bégin F. Detection of STEMI using prehospital serial 12-lead electrocardiograms Prehosp Emerg Care 2018;22(4):419-26.

Van Diepen S, Katz JN, Albert NM, Henry TD, Jacobs AK, Kapur NK, et al.; American Heart Association Council on Clinical Cardiology; Council on Cardiovascular and Stroke Nursing; Council on Quality of Care and Outcomes Research; and Mission: Lifeline. Contemporary management of cardiogenic shock: A scientific statement from the American Heart Association. Circulation 2017;136(16):e232-68.

Wong GC, Welsford M, Ainsworth C, Abuzeid W, Fordyce CB, Greene J, et al. Canadian Cardiovascular Society/Canadian Association of Interventional Cardiology Guidelines on the acute management of ST-elevation myocardial infarction: Focused update on regionalization and reperfusion. Can J Cardiol 2019;35(2):107-32.

Zeymer U, Bueno H, Granger CB, Hochman J, Huber K, Lettino M, et al. Acute Cardiovascular Care Association position statement for the diagnosis and treatment of patients with acute myocardial infarction complicated by cardiogenic shock: A document of the Acute Cardiovascular Care Association of the European Society of Cardiology. Eur Heart J Acute Cardiovasc Care 2020;9(2):183-97.



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