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International Conference on Emergency Medicine Academic Symposium: Saving Lives Through Science – A Global Emergency Medicine Trials Summit

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International Conference on Emergency Medicine Academic Symposium: Saving Lives Through Science – A Global Emergency Medicine Trials Summit

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Abstract

Purpose. The global health emergency caused by the COVID-19 pandemic exposed critical gaps in emergency medicine research infrastructure, particularly the absence of resources to support rapid, coordinated clinical trials during crises. We summarized key discussions from a 2025 international summit of EM trialists and researchers and present recommendations to strengthen global preparedness for future pandemics and health emergencies.

Methods. An international pre-conference summit was held during the 24th International Conference on Emergency Medicine in Montreal, Canada, in May 2025. Eighteen invited speakers and four panel discussions examined the structure, operations, barriers, and facilitators of national and international EM research networks. All presentations and discussions were audio-recorded, transcribed, and manually verified. Transcripts were summarized and thematically analyzed using an iterative qualitative approach. Summit participants were invited to contribute to the development of recommendations.

Results. Five interrelated themes emerged: (1) building learning health systems, (2) sustainable funding and infrastructure, (3) citizen and community partnership, (4) collaboration at and with the front line, and (5) timely data access and linkages. These themes informed ten recommendations to improve trial readiness, including expanding research capacity in community emergency departments, harmonizing data and regulatory processes, embedding research in routine care, supporting innovative trial designs, and strengthening international collaboration.

Conclusion. Strengthening emergency medicine research preparedness requires sustained investment in integrated networks, interoperable data infrastructure, and trial-ready platforms that are embedded within clinical care. Centering patient and community engagement and fostering international collaboration are essential to enabling timely, high-quality evidence generation during future crises.

Abbreviations:
CCCTG: Canadian Critical Care Trials Group
CCEDRRN: Canadian COVID-19 Emergency Department Rapid Response Network
CEDRN: Canadian Emergency Department Research Network
ED: Emergency department
EM: Emergency medicine
EMRI: Emergency Management and Research Institute
EUSEM: European Society for Emergency Medicine
GEMINI: GEneral MEdicine INpatient Initiative
HIRAID™: History including Infection risk, Red flags, Assessment, Interventions, Diagnostics, Reassessment and Communication
ICEM: International Conference on Emergency Medicine
InFACT: International Forum for Acute Care Trialists
LMIC: Low- and Middle-Income Countries
NCER: Network of Canadian Emergency Researchers
PERC: Pediatric Emergency Research Canada
WHO: World Health Organization

Saving Lives Through Science Symposium Group
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Introduction

The global health emergency caused by the COVID-19 pandemic exposed critical vulnerabilities in the global emergency medicine research ecosystem [1], most notably the lack of a sustained Learning Health System [2]. By failing to bridge the cycle of data capture, knowledge generation, and knowledge integration back into practice, the absence of a Learning Health System hindered coordinated clinical and policy responses. As climate disasters, armed conflicts, and emerging pathogens continue to strain emergency departments (EDs) worldwide [3], the need for a unified, pre-established research infrastructure has never been more urgent to ensure timely and effective crisis management.

This summit was held on May 24, 2025, and brought together emergency medicine trialists and researchers from around the world during the 24th International Conference on Emergency Medicine (ICEM) held in Montreal, Canada, from May 24th to May 28th. Speakers attended both in person and virtually to share how their respective trial networks operate, highlight experiences, and reflect on lessons learned. Trialists and experts from multiple national and international networks participated in this open meeting. This manuscript summarizes five main themes that emerged during the summit and provides 10 recommendations for conducting collaborative clinical trials in emergency medicine.

Methods

Participant objectives were to explore the structure and operations of various emergency medicine trials and research networks, and key lessons learned, barriers and facilitators to implementation, and identify strategies to strengthen international collaboration and preparedness for future trials to collect evidence within the context of a crisis. Participants were strategically selected to represent a diverse range of research networks, spanning the full spectrum of pediatric and adult medicine across both acute and critical care settings globally. Invited participants also included experts in clinical practice, community and public health, methodologists and persons with lived experience. Participants provided a mixture of personal experience from their own projects and an overview from national or specialty perspectives. There were 18 individual speakers (see Table 1) and four panel discussions, during which summit participants were invited to pose questions to the presenters.

Each presentation, question period, and panel was recorded with the consent of the presenters. No ethics approval was required because this work is a summary of the professional opinions shared by the presenters and co-authors in their expert capacity.

An inductive reflexive thematic analysis [4] was used for content analysis. Audio files were stored on a secure server at the Centre Intégré de Santé et de Services Sociaux de Chaudière-Appalaches with restricted access and transcribed locally using AssemblyAI's speech-to-text model and Python module [5], with transcripts corrected manually for inaccuracies by NG. To manage the volume of transcribed material, transcripts were then summarized locally using the Mistral large language model (version 0.3) [6], with any summarization inaccuracies again corrected manually by NG. All transcription and summarization steps were conducted using Python (v3.13.3). Summaries were then manually coded for thematic content by NG using an inductive approach, with no pre-specified themes or categories. Codes and emerging themes were shared with co-authors for review and refinement. Following our analysis of the symposium's key themes, we proposed 10 recommendations to streamline and accelerate the development of collaborative clinical trial capacity in emergency medicine. All presenters and attendees of the summit were invited to contribute to the manuscript and verify the accuracy and interpretation of quotes and themes.

Results

Five interconnected themes emerged from the data: Building Learning Health Systems, Sustainable Funding and Infrastructure, Citizen and Community Partnership, Collaboration at the Front Line, and Timely Data Access. Recommendations addressing these five themes are listed in Table 2.

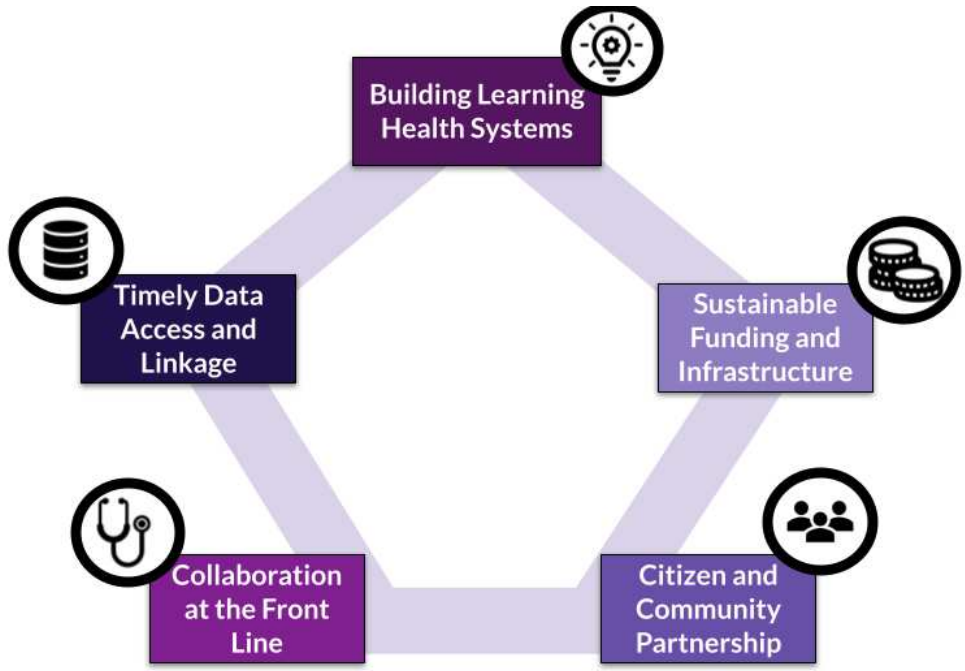


Figure 1. Core themes discussed at the Saving Lives Through Science Global Emergency Medicine Trials Summit held at the 2025 International Conference in Emergency Medicine

Building Learning Health Systems

Crisis preparedness depends on health systems that continuously generate and apply knowledge in real time, which means research capacity needs to be in place before a crisis hits. Embedding research in everyday care makes studies more efficient, scalable, and generalizable, and lowers barriers to participation for clinicians and patients.

‘Preparing for research in a pandemic requires a few things. One: able to randomize many and randomize [patients] quickly. And two: able to integrate that randomized evidence into care quickly. Make it more comfortable, make it easier to randomize patients, not just from an operational perspective, but from an equipoise perspective. Make it integrated into care, make your trials simpler.’ (Srin Murthy)

‘The future of clinical research in acute care and emerging infectious diseases lies with networks and with networks of networks that bring together clinician investigators to ask questions that rise out of clinical practice.’ (John Marshall)

While the evidence-to-practice gap is typically wide, the COVID-19 pandemic shows that this time gap can be substantially shortened through novel trial designs [7]. Platform trials (KETODEX [8]) and adaptive platform trials (GUARD-Resp [9], RECOVERY [10], REMAP-CAP [11], PRACTICAL [12]) demonstrate how trial designs can be embedded to deliver ongoing learning instead of one-off answers. Such systems can yield synergies that aim to determine the causality and biomarkers underlying clinical questions and answers. Biobanking conducted alongside clinical trials can also drive bench-to-bedside discoveries [13].

‘The Canadian Critical Care Translational Biology Group has been successful [...] such that the clinical questions that we would ask that are informed by clinical experiences, then are rounded out and expanded by the knowledge of translational and more basic scientists [...]. So looking at different biomarkers that make contemporary sense, looking at changes on the microbiome and incorporating that as companion grants with a large clinical trial [...] has been where there's been very nice success. So if a granting agency says well, there's going to be 3,600 people enrolled and if you're asking for another few hundred thousand dollars to do a translational biology component, this seems like an opportunity we shouldn't pass up: it won't come again.’ (Rob Fowler)

Evidence generated by research is not enough to drive change. Sustainable change requires deliberate use of implementation science to support behavior change. HIRAID® [14] is a structured, evidence-based emergency nursing framework but successful uptake at scale depended on applying behavior change theory, specifically the Capability, Opportunity, Motivation–Behaviour Model and Theoretical Domains Framework. These approaches identified context-specific barriers related to capability, opportunity, and motivation, and guided the design of structured training, workflow integration, and mentorship [15]. Use of HIRAID® significantly reduced inpatient deterioration requiring a rapid response team call, improved patient experience and the quality of handover [16].

'Many of us have had years of experience as nurse educators or medical educators and just telling people that they need to do stuff doesn't work. The behavioral diagnostics was really interesting. We surveyed 1200 nurses and the things that they told us would help them implement HIRAID®, well, were not surprising to us, but they wanted support in the clinical environment, they wanted to know it was going to help patients and they wanted the opportunity to ask questions. What they didn't care about was policy or people monitoring them.' (Julie Considine and Kate Curtis)

Similarly, knowledge translation and implementation science initiatives like Translating Emergency Knowledge for Kids (https://trekk.ca/) and Long COVID Web (https://www.longcovidweb.ca/) emphasize moving toward multifaceted interventions that adapt evidence into practical, usable formats for clinicians and families.

'TREKK now has over 30 to 40 topics which cover the most common conditions that children present with to emergency departments. And within two, three pages they have what are called bottom line recommendations. They've asked the knowledge creators to create summaries for practitioners that are easy and fast. And so they create these bottom line recommendations but they also create tools for families. And so when you see the one kid for the month with a condition that you're feeling uncomfortable with, you can find the treatment. You can also find videos and infographics to share with the families and you can find tools to educate your staff so they're comfortable treating that child. Our research is of no use unless people are actually implementing it into practice.'(Samina Ali)

In India, the Emergency Management and Research Institute (EMRI) implemented a telephone-based cardiopulmonary resuscitation (CPR) service to guide bystanders in performing CPR [17] and in Active Bleeding Control, enabling trained laypeople to provide immediate care for severe bleeding from road traffic injuries [18]. These programs are effective at building confidence among laypersons, but their concrete

impact on mortality remains quantified. These implementation research projects have been formalized in India and are now being adapted in other countries.

'All EMS prehospital care organizations have got a responsibility to improve the behavioral change of the population in certain emergencies like sudden cardiac arrest and active bleeding control. We had an opportunity by carrying out the right kind of action research to train laypeople on CPR and bleeding control and we have also created some best practices in the ambulance system on climate change related issues (snakebite management and heatstroke treatment).' (G.V. Ramana Rao)

These synergies offer a scalable blueprint for a healthcare system that learns in real time. To prepare for future crises, research must be embedded in the fabric of routine care and supported by robust knowledge translation and behavioral science to ensure that new evidence reaches the bedside immediately.

Sustainable Funding and Infrastructure

Resilient clinical trial capacity requires durable funding and infrastructure across the full healthcare continuum, not just crisis-response infusions. Without formal, structured clinical trial networks specifically for emergency medicine, fragmentation and duplication of efforts is likely. Limited funding for emergency medicine blocks scientists from joining and contributing to these networks within other disciplines. Additionally, funding for research networks is limited in time and highly competitive. Working within a network reduces duplicated effort and enables resource sharing, but requires funding agencies to evolve towards funding networks first, with individual trial funding then flowing through the networks.

'Having this (funding) infrastructure (in the UK) was very useful to us, even before the pandemic occurred. Following on from H1N1 in 2009, the NIHR set up a pandemic portfolio of studies that were set up in advance in 2015 so that they could be activated. Initially, they were set up in preparation for pandemic influenza, but with a degree of perceptiveness in 2019, they were focused on other respiratory infections and lo and behold, only a year later, we were asked to activate them in response to COVID-19.' (Steve Goodacre)

The Network of Canadian Emergency Researchers (NCER) was created to build a collaborative emergency medicine research network in Canada, modeled on the Canadian Critical Care Trials Group (CCCTG) [19] and Pediatric Emergency Research Canada (PERC) [20]. It has strong mentorship and grant-support processes that have helped secure over $23M in funding, but lacked its own clinical trials infrastructure. The Canadian COVID-19 Emergency Department Rapid Response Network (CCEDRRN) emerged in March 2020 and provided the infrastructure and site-level capacity for large emergency medicine observational research, including derivation and validation of COVID-19 clinical decision rules [21,22]. After the pandemic, CCEDRRN site investigators identified the need for a sustained emergency medicine network

that is able to facilitate a broad spectrum on observational research, and executed data sharing and membership agreements not specific to COVID-19, rebranding itself as the Canadian Emergency Department Research Network (CEDRN; https://cedrn.ca/). CEDRN's data sharing and membership agreement does not currently support clinical trials. This will require funding and structural changes to enable a regulatory framework to complete clinical trials. CEDRN has partnered with the Accelerating Clinical Trials network (https://act-aec.ca/), which is funded by CIHR, to break down barriers to trial implementation and recruitment and seeks to broaden access to trials for all Canadians to improve accessibility to cutting-edge therapeutics that are offered through trial participation, so that the knowledge gained is applicable to all those affected. This history underscores that large-scale trials succeed only when research is woven into the fabric of reliable clinical infrastructure. Therefore, we recommend prioritizing investment in sustainable networks and workforce development, while advocating for the long-term government funding necessary to maintain this 'warm' readiness between crises.

Citizen and Community Partnership

Crisis preparedness depends on legitimacy, trust, and collaboration with patients and communities. Involving community members, patients, and their families in all stages of the research process is essential to designing studies [23]. The principle of "nothing about us, without us" ensures that research addresses the priorities and lived experiences of those it intends to benefit [24]. Within the *Réseau de prévention des crises en santé* (Précrisa; https://precrisa.ca), there are ongoing projects to mobilize citizen participation in co-creating crisis management strategies, enabling knowledge producers to directly interact with users. Beyond enhancing relevance, this participatory approach improves research methodologies, particularly in areas such as consent processes for preference-informed [25] and adaptive trials (CAPTIVATE substudy of the GUARD-Resp and PRACTICAL trials) [26], ensuring that study designs are both feasible and reflect participant perspectives.

'The (trial) I led was a preference informed complementary trial design where the families got to choose which clinical trial they'd like to participate in because many of them had aversions to opioids (given for children in pain). So lots of innovation and learning about integrating family and patient voices into trial methodology.' (Samina Ali)

Addressing historical and ongoing injustices, including those experienced by Indigenous populations and other marginalized groups in Canada and elsewhere around the world, is critical for restoring trust in research. The Qanuikkat Siqinirmiut Project is a mixed-methods population health survey of Inuit living in southern Québec, designed to provide evidence for the development of Inuit-specific health services. The General Medicine Inpatient Initiative (GEMINI), CEDRN, and CCCTG all have indigenous patient partners to ensure that the undertaking of their projects are culturally appropriate, safe, and relevant to the needs of indigenous populations.

‘People really want to participate because they want to be seen. And that was the main thing. And that's what Qanuikkat Siqinirmiut did and it allowed the existence of a community that knew of itself to be known by others.’(Christopher Fletcher)

Epistemic humility, which is the acknowledgment of the limits of scientific knowledge and the validity of lived experience from patient and community partners, is a key message of the Long COVID Web network. Recognizing and confronting epistemic and historical injustices allows researchers to create studies that are more inclusive, ethical, and socially responsible. The onus is not to reject clinical expertise but to integrate all perspectives equally into research and care. Compounded by the pervasive nature of epistemic injustice, the ability of clinical trials to detect changes may be hampered by a lack of recognition of common disabling conditions, such as post-exertional malaise, coupled with significant challenges related to measurement instruments currently used for Long COVID [27].

‘My perspective of the darker side of the mirror is a major breach of confidence between many communities of persons living with chronic complex conditions and healthcare providers. Those arise from decades of medical traumas due to dismissal of symptoms to mental health issues.’ (Anne Bhéreur)

Meaningful crisis preparedness requires that researchers formalize the involvement of patients and marginalized communities as equal partners, ensuring that novel trial methodologies are not only scientifically rigorous but also culturally safe and grounded in lived experience.

Collaboration at the Front Line

EDs are the first hit during a crisis. Establishing new relationships and mechanisms during a crisis is difficult, so developing collaboration before a crisis occurs is essential to develop early evidence-based guidance for emergency care. Précrisa, (*Réseau de prévention des crises en santé*) is a research network dedicated to health crisis prevention. Their focus is on emerging threats likely to cause health crises, particularly the impacts of climate change and human pressures on the environment [28]. Précrisa has a dedicated health systems research axis focused on preventing pressure on health services and systems during a sanitary or environmental crisis, and on safeguarding and maintaining health services.

‘Between the research and those that are managing the crises, we need to improve communication. And in times of emergency, reliance on existing relationships, tools and mechanisms occurs naturally, while setting up new ones is very difficult. And therefore we need to prepare in advance to successfully go through crisis management.’ (Caroline Quach)

Trials addressing clinical questions in emergency medicine can and should pursue projects in pre-hospital care (as with EMRI in India), in primary care (as with the CanTreatCOVID trial [29]),

and even after discharge. The CLEAR-HORIZONS platform randomizes post-discharge patients to different therapies. Within the ED, trialists working in critical care or internal medicine should also consider screening and enrolling patients early in the disease trajectory, as many patients destined for the ward or ICU first pass through the ED.

'CATCO, REMAP-CAP, ATTACC and the World Health Organization (WHO) Solidarity Trial were facilitated by screening and enrolling patients in EDs and now GUARD is as well. Critical care and acute care is a need and not a specific place, not a specific location. It made us rethink the paradigm of situating our clinical trials team within one location and having a more malleable approach to screening and enrolling patients throughout different areas of the hospital.' (Sylvain Lother)

Emergency medicine researchers who collaborate with other specialties generate evidence more reflective of the population's needs. For instance, pediatric emergency research is largely confined to pediatric centers, even though around eighty percent of pediatric presentations occur in general EDs with fewer resources, whose data can be captured in CEDRN datasets. In many places around the world, emergency medicine remains underdeveloped compared to other specialties.

Across several initiatives, there has been meaningful outreach and capacity-building in low- and middle-income countries (LMICs). Multiple initiatives have strengthened emergency care research capacity in LMICs. The International Forum for Acute Care Trialists (InFACT) prioritized the Global South by establishing regional hubs, mentorship, training, and adaptive platform trial capacity in partnership with the WHO. REMAP-CAP and WHO Solidarity expanded COVID-19 and pneumonia trials into LMICs, improving the global relevance of findings. In India, EMRI implemented scalable prehospital and surveillance models using community surveillance. Its snakebite program was recognized by WHO as a best practice for ambulance systems in LMICs.

To move from fragmented response to a unified front, emergency medicine research must transcend traditional boundaries. We recommend that trialists adopt a more malleable approach by embedding research into routine care across the entire clinical continuum, from community-based emergency departments to pre-hospital systems worldwide.

Timely Data Access and Linkage

Preparedness requires balancing speed, ethics, and equity. Several research networks have demonstrated how shared data access can accelerate research. The UK's RECOVERY trial, supported by NIHR infrastructure, demonstrated how centralized, publicly funded systems enable near-real-time recruitment and analysis of linked data at scale, with the open sharing of protocols and results that immediately shaped global practice. CCEDRRN harmonized data collection as soon as data sharing agreements were signed across 51 hospitals at the start of the pandemic, accelerating data capture and creating a national population-based dataset that

was linked with national administrative data. Barriers remain for timely linkage with vaccination, genomic and laboratory testing data [30].

'We learned that if we harmonize across the country, we can actually create a national data set. That really allows us to get well-powered studies. They have excellent generalizability because we're not excluding anybody.' (Corinne Hohl)

International collaborations like InFACT and REMAP-CAP built harmonized trial platforms to accelerate discovery without duplicating data systems at each site. Pediatric networks such as the Pediatric Emergency Research Network and PERC have illustrated that lowering barriers to cross-jurisdictional data sharing within Canada is essential for studying conditions that are too rare to evaluate locally. GEMINI, Canada's largest hospital-based data platform, integrates standardized clinical data from over 40 hospitals. It covers 60% of Ontario inpatients and enables pragmatic trials and policy-relevant answers at a fraction of traditional cost. Currently, GEMINI supports a limited scope of trials for which a data lag of 3 to 12 months is acceptable, but is undergoing development to support trials more broadly with close to real-time data. Having anonymized, linkable, and timely health data will make Canada a far more attractive destination for scientific investment.

'The accelerated pace of being able to respond to health crises elsewhere is coming because of massive investments in clinical data infrastructure. So if you look at other jurisdictions and globally, there are huge investments happening. These are not healthcare investments. These are investments to use that data for innovation and for research. And because we haven't had similar investments so far in Canada, we're seeing a slide in terms of our global competitiveness. If you look at the trials data, over the last decade, we've had a 50% drop within Canada in terms of the trials being run here. And a lot of it is because of the inability to harness that kind of data infrastructure efficiently to run a trial.' (Fahad Razak)

CEDRN and GEMINI provide computing environments that bring researchers into secure research environments rather than sending sensitive data outward. GEMINI's success shows how a robust data infrastructure can rapidly translate evidence into practice, though Canada still lags behind global leaders due to fragmented governance and underinvestment in real-time, interoperable systems. GEMINI is a single provincial database that can provide data for clinical trials [31] whereas CEDRN collects data across 10 provinces but does not conduct clinical trials.

Recognizing these limitations, GEMINI has received an investment of >$100M from federal and provincial sources to expand its capacity across three provinces, reaching 50% of the Canadian population. This "2.0 version" of GEMINI is called the VITAL platform, and brings key additional capacities including complete capture of hospital data (including emergency room data), <24 hour lag behind real-time, enhanced clinical trials software, scaled computing capacity for more compute intensive AI applications such as large language models, close alignment with CIHI

and provincial administrative data holders to allow linkage to broader administrative datasets, and advancing governance to work with the private sector for transparent and responsible initiatives.

Harmonizing data across provincial boundaries is challenging. CEDRN has developed processes to do this and link with national datasets such as CIHI. However, provincially held administrative data, e.g. vaccine data, remains difficult to integrate seamlessly into research. Harmonization across provincial boundaries is essential to quickly and efficiently launch clinical trials. Multicenter trials also often get stuck in repeated ethics reviews and non-harmonized consent requirements. This creates delays that other countries like the UK and Denmark mitigate through harmonized networks. ACT is working towards breaking down these barriers through a harmonized ethics, contract, and data management strategy across Canada (https://canreview.ca/). The Government of Canada is also moving towards regulatory reform, including the use of a national research ethics board, accelerating clinical trials [32].

'Probably the biggest issue is that the data set that we have established in CEDRN needs to be a regulatory level database to launch clinical trials. And that means a lot more checks and balances and a lot more investment in the data set. There are also issues with sponsor liability. As each PI [principal investigator] brings their randomized trial to their institution and wishes to use the network to run, there has to be a shared liability between the PI's institute and the institute housing the network.' (Laurie Morrison)

While federated data approaches are sometimes necessary in Canada due to provincial restrictions that prevent data from being shared across jurisdictions and even between hospitals [33], value may come from moving toward a single anonymized consolidated national health dataset with one approval process. There are also similar restrictions both within and outside the European Union that make cross-border collaboration difficult.

'I want to promote multinational research as president of the European Society for Emergency Medicine. However, for us in Europe, it's also a challenge to get multinational studies up and running in part due to data regulation. European Union member states must follow the General Data Protection Regulation which addresses data collection and storage. If an organisation outside the European Union wishes to participate in a study with other organisations in the European Union, all the data must be treated and stored according to the General Data Protection Regulation.' (Robert Leach)

Ultimately, the success of future learning health systems depends on our ability to integrate data infrastructure and harmonize ethics processes, creating a regulatory environment that supports rapid discovery rather than delaying it.

Discussion

This article highlights the main themes from the ICEM pre-conference Saving Lives Through Science Symposium on how lessons learned during the COVID-19 pandemic can inform emergency medicine research to build integrated preparedness capacity and readiness to launch trials that rapidly collect evidence not only for the next crisis but also for emergency medicine practices every day. We identified the main barriers and recommendations towards the implementation of large EM research Networks, databanks, and trial-ready platforms, which were underlined by the presenters and the discussions that ensued. We believe the identified themes reflect the modern challenges of emergency medicine research, but some sub-themes might be missing, considering the use of a symposium with invited speakers instead of larger surveys to experts. Nonetheless, the panel comprised experts in contemporary research from various healthcare backgrounds, from community-based and specialized settings, and using varied research methodologies.

Ultimately, our findings serve as more than a roadmap for researchers; they constitute a call to advocacy for clinicians, health system leaders, and policymakers. We must move beyond the 'crisis-response' mindset and advocate for the structural integration of research into the fabric of daily clinical operations. True preparedness requires a commitment to the ten recommendations outlined in Table 2, which address five interconnected themes: (1) Building Learning Health Systems: We must embed research into routine clinical workflows so that evidence generation becomes a continuous, everyday activity rather than a one-off response. (2) Sustainable Funding and Infrastructure: Research capacity requires durable, long-term investment in networks and workforce development, moving away from fragmented, time-limited funding cycles. (3) Citizen and Community Partnership: By centering patient and community voices—including those from marginalized groups—we ensure that trial designs are culturally safe, ethically sound, and grounded in lived experience. (4) Collaboration at the Front Line: Developing relationships between academic, community, and pre-hospital settings before a crisis occurs ensures that research can be mobilized across the entire care continuum. (5) Timely Data Access: Harmonizing data infrastructure and streamlining regulatory hurdles—such as ethics and liability—is essential to allow for the seamless, real-time data linkage required for global competitiveness.

We call on decision makers to recognize that research infrastructure is, in fact, preparedness infrastructure. By investing in these sustainable, networked approaches today, Canada and the global emergency medicine community will not only be ready for the next pandemic or climate-driven crisis—we will also be providing higher-quality, evidence-based care every single day.

Table 1. Summary of presenters, their networks and clinical trials associated with those networks.

Presenters	Presentation Title	Research Networks	Trials
John Marshall (Canada)	*The International Forum for Acute Care Trialists: Building global collaboration in acute care research*	International Forum for Acute Care Trialists (InFACT) Canadian Critical Care Trials Group (CCCTG)	REMAP-CAP
Srinivas Murthy (Canada)	*Trying to achieve a learning health system during a pandemic*	Canadian Critical Care Trials Group (CCCTG)	REMAP-CAP WHO Solidarity
Steve Goodacre (United Kingdom)	*Undertaking Emergency Medicine Trials in the UK*	NIHR (National Institute for Health Research) UKRI (UK Research Institute)	Numerous studies listed at https://www.nihr.ac.uk/about-us/what-we-do/covid-19/covid-19-studies-jointly-funded-ukri
G V Ramana Rao (India)	*Prehospital and Emergency Medicine Research Ecosystem in India*	Indian Council of Medical Research (ICMR) Global Resuscitation Alliance World Health Organization (WHO)	PAROS
Corinne Hohl (Canada)	*The Canadian Emergency Department Research Network (CEDRN) and Learning Health Systems*	Canadian Emergency Department Research Network (CEDRN)	
Samina Ali (Canada)	*PERC: Little Patients, Big Impacts*	Pediatric Emergency Research Canada (PERC)	DOSE-AGE CanBEST SNOT PRoMPT BOLUS No OUCH
Laurie Morrison (Canada)	*Network of Canadian Emergency Researchers (NCER) Perspectives on Clinical Trials*	Network of Canadian Emergency Researchers (NCER)	LEARNING WISDOM Vitamin C and opioid reduction (NCT05555576)
Anne Bhéreur (Canada)	*Wearing Three Hats: Clinician, Researcher, and Person Living with Long COVID*	Réseau de prévention des crises en santé (Précrisa) and Long Covid Web	RECLAIM (NCT05513560)

Christopher Fletcher, Lisa Watt (Canada)	*Community mobilization to address structural inadequacy in health services for Inuit in southern Quebec*	Qavvivik and the Qanuikkat Siqinirmiut Project ArcticNet	
Julie Considine, Kate Curtis (Australia)	*Implementation evaluation of an evidence-based emergency nursing framework (HIRAID™): a cluster randomised control trial from Australia*	HIRAID™ Collaborative	HIRAID™ sw-cRCTI
Fahad Razak (Canada)	*GEMINI: Harnessing hospital data to improve healthcare*	GEMINI	COVID-PRONE
Rob Fowler (Canada)	*The Canadian Critical Care Trial Group*	Canadian Critical Care Trials Group (CCCTG)	LEADS CATCO BALANCE PROTECT
Robert Leach (Belgium)	*European Society for Emergency Medicine*	European Society of Emergency Medicine (EUSEM) Critical Care in Emergency Medicine Interest Group	
Sylvain Lother (Canada)	*GUARD-Resp platform trial*	Global Unified Adaptive Research on acute care Diseases-Respiratory infections (GUARD-Resp)	ATTACC-CAP BEAT-CAP DEFEND-CAP
Caroline Quach-Thanh (Canada)	*Précrisa: Together, for better preparedness*	Réseau de prévention des crises en santé (Précrisa) Pediatric Outcome imProvement through COordination of Research Networks (POPCORN)	

Recommendations

Below, we offer ten recommendations for enhancing preparedness for future pandemic trials within the international emergency medicine landscape.

Table 2. Recommendations for enhancing preparedness in emergency medicine clinical trial design.

Recommendation	Rationale	Implementation
1. Standardize and integrate data infrastructure	Build secure, interoperable, real-time datasets across health systems (provinces, states and countries).	Harmonize data collection standards to reduce variability across sites and jurisdictions; provide secure computing environments where researchers work with data in place instead of exporting it.
2. Streamline regulatory and ethics approval processes	Implement a single national ethics and institutional contract approval process for multicenter trials.	Harmonize ethics and institutional contracts across jurisdictions (provinces, states, countries); establish shared liability frameworks for international multicenter trial investigators and sites.
3. Support novel methodologies	Encourage trials that can evaluate multiple interventions simultaneously in EDs and wards.	Implement embedded electronic consent and dynamic randomization systems within EDs and wards, allowing trials to adjust arms or interventions in real time based on accumulating data.
4. Embed research into routine clinical care	Make trial processes seamless within workflows.	Simplify randomization, automate eligibility screening, and demonstrate to clinicians how to integrate research into their workflow without increasing workload. Have trained health professionals ready to support integrating research procedures built into usual practice

		to streamline the generation of high-quality real-world data.
5. Strengthen patient and community involvement	Involve patients and families in trial design and in the co-creating of crisis management strategies.	Use participatory research methods to improve recruitment, retention, and meaningful outcomes. ‘Nothing about us, without us.’ Embed patient-reported outcomes into data collection. Collaborate with Indigenous and marginalized communities to ensure cultural safety and relevance.
6. Expand emergency medicine research trials to EDs in community hospitals and in pre-emergency settings	Fund and equip EDs in community hospitals and ambulances to enroll patients in pediatric and adult trials. To ensure the generalizability of results and provide equitable access to potentially life-saving therapies, trials must move beyond academic centers. True preparedness requires a network that includes community and rural sites, where the majority of the population receives emergency care.	Invest in electronic medical records for community and rural sites that can support the integration of randomization and participant recruitment directly into routine clinical workflow. This allows the central principal investigator’s team to monitor sites in real-time and provides the digital infrastructure for virtual enrollment support. While electronic data capture and trial management can streamline the workflow, dedicated human resources are essential for the "last mile" of research—specifically the time-intensive and nuanced process of obtaining informed consent and building trust with patients. Instead of requiring a full independent research team at every small site, implement a "hub-and-spoke" model where trained health professionals are supported by virtual coordinators from the central

		hub to handle the administrative and consent-related requirements. Use these distributed sites to collect real-time data to inform public health responses and fill critical gaps in emergency medicine research during non-crisis periods.
7. Invest in sustainable networks and workforce development	Fund sustainable national networks to maintain infrastructure and site capacity.	Provide mentorship programs for early-career researchers and peer-support networks; create “networks of networks” to link clinicians, hospitals, and researchers globally.
8. Enhance and support knowledge translation and behavior change	Apply behavior change theory when implementing new protocols.	Develop multifaceted knowledge translation strategies; offer ongoing clinical support, training, and feedback for staff implementing trial interventions. Understand what motivates the end users and how the intervention will improve patient outcomes.
9. Remove barriers to international collaboration	Align national trial protocols with global networks to allow cross-border comparisons and rapid evidence adoption.	Build and encourage participation in international emergency medicine platform trials similar to how REMAP-CAP and GUARD-Resp have done for admitted medical ward and intensive care patients for better pandemic and crisis preparedness.
10. Advocate for sustainable government funding	Increase government investment in clinical trial infrastructure.	Fund network-based approaches integrated within day-to-day operations of health systems rather than single-site, short-term projects; provide incentives for public-private partnerships to leverage infrastructure for innovation and AI applications.

Conclusion

Our overarching recommendation to improve clinical trial capacity as part of preparing for future health crises is to invest in sustainable networks, integrated learning systems, and harmonized data infrastructure, while centering patient and public engagement. Crucially, this requires embedding research into routine care so that conducting clinical trials becomes an intrinsic component of daily emergency practice. By normalizing these processes during 'peacetime,' we ensure the operational agility required to address emerging health crises linked to climate change and future pandemics. With such a foundation, Canada and the global community can continue to conduct timely, large-scale, and globally competitive trials that translate directly into resilient emergency medicine.

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Conflicts of interest: Patrick Archambault is a member of the Network of Canadian Emergency Researchers, the Canadian Critical Care Trials Group, the Canadian Emergency Department Research Network, the Long COVID Web and Précrisa. He has received funding from the Canadian Institutes of Health Research and the Fonds de recherche du Québec - Santé in support of these research networks. He has also received funds for a clinical trial led by AstraZeneca unrelated to this publication. Laurie Morrison is a member of the Network of Canadian Emergency Researchers Executive, the Canadian Emergency Department Research Network and holds peer reviewed grants from CIHR and Heart and Stroke Canada. The other authors have no conflicts of interest to declare.

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Appendices:

Appendix A: Programme

Link to programme: https://archambaultlab.ca/en/scientific-activities/upcoming-event/

Presenter(s)	Title of presentation given at the symposium	Network or Group presented at the symposium
John Marshall	*The International Forum for Acute Care Trialists: Building global collaboration in acute care research*	International Forum for Acute Care Trialists (InFACT) Canadian Critical Care Trials Group (CCCTG)
Srinivas Murthy	*Trying to achieve a learning health system during a pandemic*	Canadian Critical Care Trials Group (CCCTG)
Steve Goodacre	*Undertaking Emergency Medicine Trials in the UK*	NIHR (National Institute for Health Research) UKRI (UK Research Institute)
G V Ramana Rao	*Prehospital and Emergency Medicine Research Ecosystem in India*	Indian Council of Medical Research (ICMR) Global Resuscitation Alliance World Health Organization (WHO)
Corinne Hohl	*The Canadian Emergency Department Research Network (CEDRN) and Learning Health Systems*	Canadian Emergency Department Research Network (CEDRN)
Samina Ali	*PERC: Little Patients, Big Impacts*	Pediatric Emergency Research Canada (PERC)
Laurie Morrison	*Network of Canadian Emergency Researchers (NCER) Perspectives on Clinical Trials*	Network of Canadian Emergency Researchers (NCER)
Anne Bhéreur	*Wearing Three Hats: Clinician, Researcher, and Person Living with Long COVID*	Réseau de prévention des crises en santé (Précrisa)
Christopher Fletcher, Lisa Watt	*Community mobilization to address structural inadequacy in health services for Inuit in southern Quebec*	Qavvivik and the Qanuikkat Siqinirmiut Project
Julie Considine, Kate Curtis	*Implementation evaluation of an evidence-based emergency nursing framework (HIRAID): a cluster randomised control trial from Australia*	HIRAID
Fahad Razak	*GEMINI: Harnessing hospital data to improve healthcare*	GEMINI
Rob Fowler	*The Canadian Critical Care Trial Group*	Canadian Critical Care Trials Group (CCCTG)
Robert Leach	*European Society for Emergency Medicine*	European Society of Emergency Medicine (EUSEM) Critical Care in Emergency Medicine Interest Group
Sylvain Lother	*GUARD/ATTACC-CAP platform trial*	Global unified adaptive research on infectious

		disease (GUARD)
Caroline Quach	*Précrisa: Together, for better preparedness*	Réseau de prévention des crises en santé (Précrisa) Pediatric Outcome imProvement through COordination of Research Networks (POPCORN)