

... for a safer Singapore

From Fundamentals to Specialisation: Training Paramedics to meet Singapore's EMS needs

COL (DR) Hong Dehan "Woody" Chief Medical Officer Emergency Medical Services Department Singapore Civil Defence Force

How does ED overcrowding happen?

 ED overcrowding occurs when demand exceeds the available resources, leading to longer wait times, strained hospital resources, and poorer patient outcomes.



Overview



The calls are projected to Increase beyond the 5%...



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EMS CALLS 250,000

POPULATION 5.92 MILLION





What Must Change?

- To meet the rising EMS demand, we need to develop new initiatives such as:
- **1. Increasing the number of ambulances** Expanding fleet capacity to meet rising demand.
- Increasing recruitment and upskilling
 – Strengthening
 manpower to handle case volume and improve response
 times.
- **3. Evolving EMS operations** Shifting from **transport-focused EMS** to an integrated **prehospital care system**.



Strengthen Fundamentals for the Masses, Specialise for the Future

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Increasing Training Pipeline

- NYP 1 year full-time Diploma
- NYP 2.5 years part-time Diploma
- ITE 2.5 years Work-Study Diploma
- PSB-CU 1 year full-time Diploma

150 new paramedics annually

13/44

Strengthening Fundamentals Through Continuous Learning

Knowledge is perishable



Hence, continuous learning is important





New Training Initiative to Strengthen Fundamentals

Phased learning approach

- Read curated articles weekly
- Take a quiz to test knowledge retention
- Analyse learning outcome



15/44

Other Proposed Training Initiatives to Strengthen Fundamentals

Scenario-based testing



Case-sharing/case presentation between peers, between juniors and seniors



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Reflection and review





Novel Ideas for Exploration



Support for Training

- A&E attachments for frontline paramedics
- Inter-disciplinary learning
 - ✓ Journal clubs,
 - ✓ M&Ms
 - ✓ HO/ MO/ Resident teaching



18/44

The Changing Landscape of EMS: What Can We Learn?

- Traditional EMS Model vs. Evolving Needs
- Then: EMS primarily focused on rapid response and transport to hospitals.
- Now: Modern EMS systems globally are reducing unnecessary transports and enhancing prehospital care.

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International Success Stories

- 1) Al in EMS (Copenhagen, Denmark)
- Al-assisted emergency call triage detects cardiac arrest over phone calls.
- Reduces response time and improves early intervention.

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Scand J Trauma Resusc Emerg Med. 2022 May 12;30:36. doi: <u>10.1186/s13049-022-01020-6</u>

Artificial intelligence in Emergency Medical Services dispatching: assessing the potential impact of an automatic speech recognition software on stroke detection taking the Capital Region of Denmark as case in point

<u>Mirjam Lisa Scholz</u>^{1,2,⊠}, <u>Helle Collatz-Christensen</u>¹, <u>Stig Nikolaj Fasmer Blomberg</u>¹, <u>Simone Boebel</u>^{1,2}, <u>Jeske</u> <u>Verhoeven</u>^{1,2}, <u>Thomas Krafft</u>²

Findings:

- An automatic speech recognition (ASR) software from CORTI AI is able to increase recognition of OHCA at EMS by 16%
- The usage of the CORTI AI model suggests that the ASR is able to increase stroke recognition by EMS from 52.75 to 61.19%
- Increased detection rate might decrease the number of multiple EMS calls for stroke patients

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International Success Stories

- 2) Telemedicine in EMS (Copenhagen, Australia)
- Teleconsultation with secondary triage or Virtual ED co-management with paramedic on scene to assess and provide alternative treatment options.
- Reduces conveyance to ED.

▶ J Am Coll Emerg Physicians Open. 2024 Jul 25;5(4):e13231. doi: <u>10.1002/emp2.13231</u> ☑

From concept to reality: A comprehensive exploration into the development and evolution of a virtual emergency department

Jason Talevski ^{1,2,3,⊠}, Adam I Semciw ^{4,5}, James H Boyd ², Rebecca L Jessup ^{4,5}, Suzanne M Miller ^{1,6}, Jennie Hutton ^{1,2,6}, Joanna Lawrence ^{1,7,8}, Loren Sher ^{1,2,9} Key points

- strong stakeholder collaboration among hospitals, Ambulance Victoria, health services, and government bodies
- unified approach to the design and development of this model of care
- developing an organizational governance structure
- financial investments from Government agencies play a pivotal role in our work
- iterative reporting and feedback to relevant government organizations
- clear guidelines, in-depth orientation, and continued education for VVED staff
- public awareness and willingness to embrace telehealth services





International Success Stories

- 3) Advanced Paramedic Back Up to Improve Clinical Outcomes(Australia, Taiwan)
- Calling for back up in complex cases such as OHCA improves clinical outcome for patients.

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> Resuscitation. 2018 Jan:122:48-53. doi: 10.1016/j.resuscitation.2017.11.048. Epub 2017 Nov 21.

The effect of the number and level of emergency medical technicians on patient outcomes following out of hospital cardiac arrest in Taipei

Jen-Tang Sun ¹, Wen-Chu Chiang ², Ming-Ju Hsieh ³, Edward Pei-Chuan Huang ³, Wen-Shuo Yang ⁴, Yu-Chun Chien ⁴, Yao-Cheng Wang ⁴, Bin-Chou Lee ⁵, Shyh-Shyong Sim ⁶, Kuang-Chao Tsai ⁶, Matthew Huei-Ming Ma ⁷, Lee-Wei Chen ⁸

Findings:

- An on-scene EMT-P ratio >50% was associated with improved survival to discharge of OHCA cases, especially in those with witnessed, nonshockable rhythm
- The presence of four EMTs with an EMT-P ratio >50% at the scene of OHCA was associated with the best outcome.

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International Success Stories

- 4) Community Paramedicine (UK, Australia, US)
- Paramedics provide home-based care for low acuity or non-emergency patients to reduce unnecessary ED visits.

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> Appl Health Econ Health Policy. 2024 Sep;22(5):665-684. doi: 10.1007/s40258-024-00902-3. Epub 2024 Jul 17.

The Economic Impact of Community Paramedics Within Emergency Medical Services: A Systematic Review

Matt Wilkinson-Stokes ¹, Michelle Tew ², Celene Y L Yap ³, Di Crellin ³, Marie Gerdtz ³ Affiliations + expand PMID: 39017994 PMCID: PMC11339145 DOI: 10.1007/s40258-024-00902-3

Findings:

Models unanimously reduced emergency department (ED)
transportation by 14-78% (higher quality studies reduced emergency department transportation by 50-54%, n = 2639 intervention, p < 0.001), and costs were reduced by AU\$338-1227 per attendance in four studies (n = 2962).



Health and Social Care in the community

REVIEW ARTICLE 🔂 Open Access 💿 🔅

The development of community paramedicine; a restricted review

Brendan Shannon BEmergHealth(Pmed)(Hons) 🔀, Georgette Eaton MSc, Chelsea Lanos BSc, MSc, Matthew Leyenaar PhD, Mike Nolan MA, Kelly-Ann Bowles PhD, Brett Williams PhD ... See all authors 🗸

First published: 05 September 2022 | https://doi.org/10.1111/hsc.13985 | Citations: 27

Community paramedicine programmes result in a net reduction in acute healthcare utilisation, appear to be economically viable and result in positive patient outcomes with high patient satisfaction with care.

29/44

What This Means for Singapore

- We must **move beyond just transport**—EMS should provide **on-site care and alternative care pathways**.
- Integrating EMS with community resources can reduce unnecessary hospital transports.
- Technology and data-driven decision-making will enhance EMS efficiency.
- Paramedics, at the core of EMS, will need to be prepared for the evolving landscape





...a Hybrid Protocol and Evidence-/Guideline-based Approach



Introduction of SCDF Paramedicine Expert Scheme





Paramedic Expert

- New professional pathway
- Deepen expertise
- To be better prepared to meet future demands for Emergency Medical Services

Level 3/Primary Care Paramedic

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Level 4/Advanced

Care Paramedic



Introduction of SCDF Paramedic Experts

- The first batch of paramedic experts will be appointed in Apr 25
- Build deep expertise and professional specialisation
- Do research, develop new initiatives and drive EMS changes in clinical and education tracks

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Potential Changes in EMS Concept

Extended Care Paramedics	Advanced/ Specialist Care Paramedic	Operations Centre Clinical Support
Holistically assess, treat and refer low acuity cases to alternate care pathways	Forward deployed to provide support to frontline EMS crew for complex cases	Utilise emergency video system for secondary triage and more accurate EMS disposition Lend clinical support to frontline EMS crew remotely



Upskilling the Paramedic Experts

- A 12-month, part-time Graduate Certificate programme developed by Lee Kong Chian School of Medicine with UPEC and SCDF
- Programme will develop paramedics' critical thinking and clinical reasoning skills to help them better manage medically complex cases
- Expected to be available in CY2026



36/44

Support Required

Greater collaboration with MOH, UPEC, hospitals and universities to upskill paramedics.

- Hospital/specialty attachments focusing on
- Trauma
- Cardiology
- Stroke
- Geriatric
- Paediatric
- Obstetric
- Critical Care
- Education
- Research



37/44

- Development of Post-Graduate or Specialist Training Programmes
- Mentorship and Guidance on clinical practice, education research
- Healthcare Leadership Development, Systems and Organisational Thinking
- Work in multi-disciplinary teams to develop healthcare innovations

Challenges in Implementing Change

- Manpower Constraints Recruitment and retention of skilled paramedics.
- Balancing Generalists vs. Specialists Ensuring all paramedics have strong fundamentals while allowing advanced specialisation.
- Regulatory framework Expanding paramedic scope of practice requires policy changes.
- Public & hospital system buy-in Changing perceptions of EMS from transport providers to healthcare professionals.

Conclusion

- Whole of system approach to address pre-hospital challenges
- We must integrate EMS with the broader healthcare system, adopting global best practices while contextualising them for Singapore
- Paramedics remain the core of EMS
- The future paramedic is not just an emergency responder they are a critical healthcare provider, problem-solver, and leader.



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