Topic: Community Paramedics are effective in delivering low acuity trauma care.

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Clinical Question

In patients requiring low acuity trauma care (LATC), are Community Paramedics (CP) effective in delivering prehospital LATC to these patients with improved patient outcomes (PO)?

Rationale

Emergency department (ED) overcrowding is a prevalent healthcare issue (Morley et al., 2018). Inefficient prehospital patient triage increases strain on resources, extends ramping time, reduces PO, and increases risk of preventable death and permanent disability. Improved prehospital identification and treatment of LATC can optimise allocation of patient transport to corresponding facilities for their condition (van Rein et al., 2018). Low acuity (LA) trauma can include falls, musculoskeletal injuries, or minor lacerations (Somers et al., 2018). Early clinical trauma intervention can improve PO and reduce likelihood of deterioration (Abhilash & Sivanandan, 2020).

Method

A PRISMA flow diagram (Page et al., 2021), attached in Appendix 4, search including 3 databases (Medline OVID, CINAHL Complete, Embase) using search strategy (“community paramedic*”) and (prehospital* or paramed* or pre-hospital* or "out of hospital" or out-of-hospital or ambulance* or "emergency medical technician*" or "emergency medical service*" or EMS) and ("low acuity trauma care" or "low acuity" or "trauma care" or trauma*) yielded 30 results. Inclusion criteria was articles published between 2018 to 2021 written in English. Exclusion criteria was animal studies, inaccessible sources and sources considered least relevant to clinical question. 5 sources were included after manual screening. Search terms, inclusion and exclusion criteria were considered to provide a representative range of results for a new emerging paramedicine specialisation and relevance for future practise. Individual database search results attached in Appendices 1-3.

Table 1: Validity and clinical relevance of evidence.

Author(s), Date	Population: sample characteristics	Design and National Health and Medical Research Council Level of Evidence (Page et al., 2014)	Outcome	Results	Strengths (+) and limitations (-)
Ontengco, 2019	Maine Medical Center ED patients. Mean age 79.9, standard deviation (8.6). Patient age range 65-104.	Mixed-method approach from patient data and survey questions as a Likert scale and free text. Level IV.	Patient-initiated visit scheduling to CP-initiated visit scheduling home visit comparison.	63.1% of injured participants with fall history admitted to trauma services. Study end-stage referral rates sustained at 95.5%.	(+) Included patients were LA trauma-related. (+) Study collected quantitative and qualitative data for usage of CP service and its feasibility. (+) Consistent age and gender characteristics across groups.
					(-) Study focuses on elderly fall patients than a range of LATC. (-) Small sample size and convenience sample of included patients which reduces validity of findings and has potential for confounding variables. (-) Ethnic demographics mentioned but not discussed in-depth.
Somers et al., 2020	Baltimore City EMS transports for LA patients treated by CP involved Minor Definitive Care Now (MDCN) program. 144	Questionnaire and database systematic review from a pilot program. Level III-2.	Number of Maryland ED admitted patients after MCDN screening of LA calls such as falls,	144 of 168 patients treated by MDCN. 65% treated on scene, 3.2% of these patients went to local ED within 72 hours, 26% were transported to urgent care facility and 0.6% transported to primary care	(-) Not a double-blinded RCT – reduces reliability of results. (-) Small sample size in one specific city without control group. (+) Patient care satisfaction survey average 9.45/10 and 11.6% of CP

	patients with an age range of 18-95.		musculoskeletal injuries or minor lacerations.	provider for same day appointment, 8.4% transported to ED. ~49.8% of patient complains were LA trauma.	patients transported indicating effective CP LATC.
Guo et al. (2019)	CP involved in systematic review.	Systematic reviews of RCT and observation studies on effectiveness and safety of CP in assessing and treating LA patients.	Emergency care practitioner program paramedic effectiveness shown by clinical indicators.	CP programs lack robust evidence in reducing emergency calls, ED visits and hospital admissions/readmissions. Most studies did not report on safety outcomes, no significant safety issues were recorded.	(-) Insufficient evidence to conclude CP care is safe. (+) Different studies such as RCT were included in review improving results reliability.

		Level I.			

Gingold et al. (2021)	3725 LA Maryland emergency calls attended by EMS.	Natural experiment observational study design of pilot prehospital diversion program on ED transport using EMS. Level III-2.	Measure effect of a treat-inplace and alternative destination program on ED transport and EMS utilisation.	CP screen calls for priority patients needing care. Standard EMS response decreased ED transport (12%) but no effect case time. CP patients had 90% reduction in adjusted relative risk for ED transport and ~22minute reduction in ambulance time on task.	(+) Included a control group to compare the effect of CP program to non-program paramedics. (+) Clinical outcomes show CP care effectiveness in reduced ED transport and time on case and patient assessment/identification of condition key factor in care. (-) Selection bias from CP selfscreening patients. (-) Resource-poor urban area single program study with low incomes and health literacy - reduces generalisability of findings.
Cozzi et al. (2020)	Grand Rapids metropolitan area elderly patients (>65 years) calling for EMS.	Retrospective cohort analysis. Level III-2.	Effect of homebased CP program on elderly patient hospital use rates.	CP patients had less trauma complaints (2.8%) than control group (20.6%). Less CP patients were transported to ED (15%) than control patients (73%). CP patient hospital admission rate (38.6%) and length of stay (4.7 days) was less than control patients (59.3% and 6.2 days).	(-) Limited to one geographical location and EMS - reduces generalisability of findings. (-) Not all patients were LA trauma patients. (+) CP care improves patient outcomes in elderly patients such as hospital admission and length of stay. (+) CP LATC feasibility supported by reducing healthcare costs for EMS and patients, overall improving patient health.

Table abbreviations: Community Paramedics; CP, Emergency Department; ED, Emergency Medical Service; EMS, Low Acuity; LA, Low Acuity Trauma Care; LATC, Randomised Controlled Trials; RCT.

Conclusions for Practice

Most included sources had a low evidence level without quality control measures such as a control group, follow-up study, double-blinding and randomised allocation measures to reduce potential bias. The sample populations were small or specific to one location, excluding Guo et al. (2019). The evidence supplies some support for effectiveness of prehospital LATC by CP, however there is no direct or robust evidence to support a firm claim. However, CP research have supporting evidence for safety, satisfaction, and clinical indicators for effectiveness of CP LA care as well as some evidence of potential feasibility by reducing healthcare and resource cost.

CP are part of an interdisciplinary healthcare team for safe immediate and long-term holistic care extending to health education, health monitoring and service referral, particularly in underserviced and disadvantaged communities (Martin & O'meara, 2020) (Leyenaar et al., 2019) (Bigham et al., 2013). CP reduce high acuity case rates from early intervention, decreased use of EMS and hospitalisation rates, improving feasibility in certain communities to reduce healthcare costs for EMS and patients (Cameron & Carter, 2019) (Fishe et al., 2019) (Cozzi et al., 2020) (Somers et al., 2020).

Community paramedicine is a new, dynamic, and expanding scope of practice (SOP) (Wilson et al., 2016) (Ford-Jones & Daly, 2020). Further investigation for specific CP skill specialisation for different communities is important to improve effectiveness of LATC (Acker & Tania, 2021). Included sources had common limitation of specific geographic locations, populations and services studied which decreased generalisability of findings. Remote CP make different prehospital long-term decisions such as health monitoring and patient referral to healthcare providers (other than ED) (Bowles et al., 2017). Patient demographics vary between communities. Elderly patients are prone to LA trauma (e.g., falls). CP programs have improved PO, particularly elderly fall patients through severity and treatment diagnosis, and supportive referral services (Breyre et al., 2021) (Ontengco, 2019).

LATC can include urgent emergency care, regular monitoring, primary care, preventive care, informed interdisciplinary clinical referrals and health education which can be provided by CP with a specialised and extended SOP (Bowles et al., 2017) (McManamny et al., 2020) (Leyenaar et al., 2019). This reduces LA trauma burden and allows other patients earlier ED care and increased circulation of ambulances to other dispatches (Ngyuen et al., 2016) (Gingold et al., 2021).

Current Practice Implications

CP SOP is unclear and not standardised, however evidence of CP provided LATC effectiveness is improved by CP training tailored for specific communities and trauma prevalence. In metro areas CP can specialise in providing LATC care to allow responding ambulance diverting to other dispatches, while in rural areas CP can respond in the absence of available ambulances (Somers et al., 2020). The Queensland Ambulance Service (2018) recruits First Responders (who are not CP) for initial EMS response until paramedic arrival which has been effective in rural or remote locations. Continuation of this program can continue to provide effective LATC, particularly with training appropriate to trauma prevalence in the community. Further research across different socioeconomic and geographic communities is required for greater understanding and implementation of CP services and its effectiveness.

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Appendix 1

Medline OVID source search results.

Bigham, B. L., Kennedy, S. M., Drennan, I., Morrison, L. J. (2013). Expanding paramedic scope of practice in the community: a systematic review of the literature. *Prehospital Emergency Care, 17,* 361-72. https://dx.doi.org/10.3109/10903127.2013.792890

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Appendix 2

CINAHL Central source search results.

Perry, N. (2015). EMS World Expo Hits the Jackpot in Las Vegas. *EMS World*, *44*(11), 12–13.

Bigham, B. L., Kennedy, S. M., Drennan, I., & Morrison, L. J. (2013). Expanding Paramedic Scope of Practice in the Community: A Systematic Review of the Literature. *Prehospital Emergency Care*, *17*(3), 361–372. https://doiorg.libraryproxy.griffith.edu.au/10.3109/10903127.2013.792890

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Appendix 3

Embase source search results.

2012 Paramedics Australasia Conference. (2013). [Conference Review]. *Australasian Journal of Paramedicine*, *10*(3), 1.

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Appendix 4

Prisma Flow Diagram (2020) from Page et al. (2021).