

Paramedic Critically Appraised Topic

Title:

Incidence of infectious control procedures by paramedics vs. expected infectious control standards.

Reported by:

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Clinical Scenario:

Paramedics are dispatched code 4 for a traumatic cardiac arrest. They arrived on scene to find their patient was ejected from a vehicle after it collided with another car. The patient is unresponsive with an external hemorrhage from their leg and requires CPR, defibrillation, and immediate extrication. At what point during the call do paramedics apply PPE such as gloves and perform additional infectious control procedures?

PICO (Population-Intervention-Comparison-Outcome) Question:

In primary care paramedics, does self reported hand hygiene practices compared to expected infectious control standards as per the CDC and WHO result in similar occurrences of infectious control procedures performed by medics in the field?

Search Strategy:

(paramedic OR EMS OR pre-hospital OR EMT OR health care provider OR ambulance OR emergency medical technician) AND (gloving OR hand hygiene OR infectious control OR hand washing)

Limits: last 5 years, English

Search Outcomes:

CINAHL=100

MEDLINE=89

Relevant Papers: 3

Author, Date	Population: Sample Characteristics	Design (LOE)	Outcomes	Results	Strengths/Weaknesses
Barr et al (2017)	Participants were recruited from Paramedic Australasia (PA), an organization representing Australian paramedics. 417 paramedics and patient transport attendants participated in the online survey. 12 PA members participated in semi structured focus groups.	Qualitative cohort study LOE=3	-Infectious prevention and control procedures were performed in the pre-hospital setting appropriately and often. -Noncompliance with hand hygiene procedures was found among paramedics in the pre-hospital setting.	The majority of the participants perceived hand hygiene and gloving as important, however there was a lack of compliance in both. This increased during high acuity calls.	<u>Strength:</u> -Online survey was designed to be completed anonymously and in a short period of time. <u>Weakness:</u> -There may be bias from participants to show higher compliance in infectious control procedures. -Research was only conducted on PA members so it is unclear if data is an accurate representation of all Australian paramedics. -Participants were self selected and large dropouts occurred. This may bias study results.
Bucher et al (2015)	Emergency medical service workers in the United states. 1494 EMS workers responded, the	Qualitative cohort study LOE=3	-Identify the number of hand hygiene procedures self reported by	Reported hand hygiene was poor among all responders, with	<u>Strength:</u> -The survey was sent out nationally, allowing for a large pool of data

	<p>participants were subdivided into groups based on age, gender, training, status (paid/volunteer), years of experience, and hygiene training.</p>		<p>paramedics. -Determine the reported rates of stethoscope cleaning by EMS</p>	<p>women reporting higher hand hygiene than men. Gloves were used in 54% of patient contact. Incidences of reported hand hygiene was low after invasive procedures (33%). Having hand sanitizer available did not improve hand hygiene procedures, but it did increase the reported cleaning of stethoscopes (13%).</p>	<p>to analyse. <u>Weakness:</u> -Many of the results showed significant differences, however they may not have been clinically significant based on the answers being similar. -There may be bias in the results as the study did not show geographical location, response rates, and the data was collected using a convenience sample.</p>
<p>Vikke et al (2019)</p>	<p>EMS providers, both basic and advanced care, in Finland, Sweden, Denmark, and Australia were observed. 2 observers witnessed a total of 60 hours per country, equalling about 87 patient encounters.</p>	<p>Prospective observational study LOE=3</p>	<p>Observe the hand hygiene (HH) compliance among EMS providers according to the WHO guidelines.</p>	<p>HH compliance was low amongst EMS providers in all four countries observed. Use of hand washing or rubs was 3% prior to patient contact and 19% after contact with an</p>	<p><u>Strength:</u> -Researchers tried to minimize observation bias as EMS personnel were not aware that HH was the specific target of the study and results were anonymized before being analyzed. -The study was</p>

				over reliance on gloves.	<p>conducted across multiple countries in both private and public sectors. This increases the generalizability of the results.</p> <p><u>Weakness:</u></p> <p>-EMS providers were told that they were being observed on infectious control procedures which could introduce bias (Hawthorne effect) in their HH procedures.</p>
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Comments:

LOE-based on Chart from Fanshawe Library.

The PICO question was difficult to construct as the goal of this CAT was to answer an observational question. No direct act was being performed where a result could be recorded. Overall three articles were chosen to determine if hand hygiene and infectious control procedures were self reported to the same level expected by guidelines and standards.

Consider: Why would you NOT change current practice based on these articles?

Most studies concerning this topic consisted of online surveys as their main methodological approach. The observational study that was conducted by Vikke et al was time consuming and introduced potential observational bias into the data. The issue with online surveys is that since they are convenience based and self reported, it is unclear if the data is accurate. However, all studies found a low compliance with hand hygiene even when it was self reported, suggesting this number could be even lower when observed in the field. Further research is needed to identify the potential reasons for

low hand hygiene and infectious control procedure compliance by working paramedics. This needs to be done before one can try to alter current practice.

Clinical Bottom Line:

Infectious control procedures, specifically hand hygiene practices, are well documented in the WHO and CDC. However, despite the availability of guidelines and the understanding that hand hygiene and infectious control procedures are important, there is a lack of compliance in working paramedics. Overall there is a decrease in hand hygiene throughout patient contact and patient care.

References:

- Barr, N., Holmes, M., Roiko, A., Dunn, P., & Lord, B. (2017). Self-reported behaviors and perceptions of Australian paramedics in relation to hand hygiene and gloving practices in paramedic-led health care. *American Journal of Infection Control*, 45(7), 771–778. <https://doi-org.ezpxy.fanshawec.ca/10.1016/j.ajic.2017.02.020>
- Bucher, J., Donovan, C., McCoy, J., & Ohman-Strickland, P. (2015). Hand Washing Practices Among Emergency Medical Services Providers. *Western Journal of Emergency Medicine: Integrating Emergency Care with Population Health*, 16(5), 727–735. <https://doi-org.ezpxy.fanshawec.ca/10.5811/westjem.2015.7.25917>
- Vikke, H. S., Vittinghus, S., Giebner, M., Kolmos, H. J., Smith, K., Castrén, M., & Lindström, V. (2019). Compliance with hand hygiene in emergency medical services: an international observational study. *Emergency Medicine Journal*, 36(3), 171–175. <https://doi-org.ezpxy.fanshawec.ca/10.1136/emered-2018-207872>