Paramedic Critically Appraised Topic

Title: Implementation of current infectious control practices in Paramedics

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PCC (Population – Concept – Content):
Do paramedics receive adequate training to ensure proper implementation of current infectious control practices to best protect themselves during an infectious disease outbreak?

Search Strategy:
(paramedic student OR emergency medical technician student OR emt student OR first responder student OR paramedic training OR emergency medical technician training OR emt training OR first responder training OR emergency medical service student OR emergency medical service training OR ems student OR ems training) AND (infection control OR infection prevention OR cross infection OR disease transmission OR universal precautions OR standard precautions OR standard precautions in infection control OR equipment contamination OR contamination OR infectious OR infectious disease OR communicable disease)

Search Outcome: 11 results (3 CINAHL, 8 MedLine)

Relevant Papers: 3

Author, Date	Population: Sample Characteristics	Design (LOE)	Outcomes Measured	Results	Strengths/Weaknesses
Harris et al (2010)	Convenience sample of 311 EMS workers from 17 agencies in Virginia US	Cross-sectional convenience sampling survey, LOE 3	- Participants who reported inconsistent compliance with universal precautions (CUP) when treating patients	-EMS providers experience significant exposure but are not consistently using universal precautions	<u>Strengths:</u> -Looked at a wide range of agencies as opposed to just one - All prevalence factors were measured -Helpful in generating a new hypothesis

			- Failure to wear gloves - Appropriate disposure of contaminated material in compliance with universal precautions - Failure to properly dispose needles - Sharps- recapped needles	- 17% of participants failed to wear gloves during patient contact - 79% failed to dispose contaminated materials appropriately - 89% of the time needles were inappropriately disposed -40% of respondent's recapped needles	<u>Weaknesses:</u> -Older study -Questionnaire was not disclosed, thus we are unaware of sampling questions - Sample group was not specified - Interpretation of data may be subjective and the methodology in which it was interpreted was not mentioned - Convenience sample, thus is may not be an accurate representation of the data

Author, Date	**Population: Sample Characteristics**	**Design (LOE)**	**Outcomes Measured**	**Results**	**Strengths/ Weaknesses**
Aurora et al (2018)	2,165 EMS organization members in the United States (Two Groups) <u>Group One</u> 451 at the Lead Level including: -12.9% training officers	Retrospective analysis, LOE 3	- Do workplace agencies provide adequate training on patient and practitioner safety related to highly infectious diseases (HID) and communicable diseases.	-95.6% of Leads and 85.9% of frontline respondents felt that "yes" they do receive adequate training on HID. - The majority of participants responded "somewhat willing" to encounter HIDs,	<u>Strengths:</u> - Questionnaire asked specific and relevant questions - Well organized charts were displayed, making for easy comparison between both groups -Easy to follow up in the future

	-52.8% administration position -20.2% were chiefs -14.2% paramedics, firefighters & EMTs <u>Group Two</u> 1,126 Frontline Level including: -56.8% paramedics -33% were EMTs -4.8% officers -5.4% support workers		- Willingness to encounter potential highly infectious disease scenarios - Self-reported comfort levels (ranging from very comfortable to very uncomfortable) when encountering highly infectious disease situations in Lead level vs Frontline level personnel - Where EMS survey respondents receive their up-to-date info about HIDs	47.6% at the Lead level and 34.9% at the Frontline Level. - The majority of participants selected somewhat comfortable at 38.8% Lead level and 38.1% Frontline level, while the other vast majority selected somewhat uncomfortable at 32.0% lead level participants and 24.8% frontline level participants. - The majority of respondents (67.7% Lead level and 42.3% Frontline level) selected government websites (ie, CDC and World Health Organization), while one-third of Frontline level respondents (37.5%) receive the info from coworkers or from word of mouth.	-Large sample size with a variety of organization members -Relevant study <u>Weaknesses:</u> -Subject to bias or misclassification of bias -Other key statistics cannot be measured -Recruited by convenience sampling (electronic survey), thus not representative of general population

Author, Date	Population: Sample Characteristics	Design (LOE)	Outcomes Measured	Results	Strengths/ Weaknesses
Roberts et al (2015)	370 Paramedics in BC Canada - 120 females - 250 males - EMA level/Certification: EMR (42), PCP (288), ACP (28), CCP (9), other (3) - Full time (166) and part time (204) -Years worked ranged from <1->25 years	Cross-sectional convenience sampling survey, LOE 3	-Knowledge questions regarding infection control procedures and percentage of correct answers -Percentage of self-reported compliance with infection control practices -Participants confidence levels in their EHS agency's pandemic preparedness plan - PPE availability	370 completed questionnaires: -52% of total questions answered correctly. -The majority of paramedics fell between the 76-100% compliance range. - 45% lack confidence in EHS preparedness. plan - 19% lack of PPE	<u>Strength:</u> - Large and dynamic sample size - Well conducted, specific and pertinent questions were studied - Information was clearly outline and data was well organized in charts – Good descriptive analysis <u>Weaknesses:</u> - Limitations of this survey include the ability to assess only self- reported compliance. - Survey did not address causes for non-compliance – Susceptible to bias

Comments:
In conclusion, there was a total of three articles chosen to help determine if paramedics receive adequate training to ensure proper implementation of current infectious control practices to best protect themselves during an infectious disease outbreak. All three articles looked at similar aspects in regards to Paramedics perceptions of infectious disease

outbreaks and how compliant they were with a variety of factors involving infection control practices. Each of these articles concluded that although Paramedics do receive infection control training to some degree, they feel that in an event of an outbreak many of them feel uncomfortable and lack confidence. Furthermore, these articles also looked at how compliant participants were with numerous areas of the universal precautions when treating patients. This revealed that some paramedics fail to wear gloves when treating patients and inappropriately dispose contaminated materials. Paramedics in these studies also lacked the inability to appropriately answer questions regarding infection control procedures, thus resulting in poor implementation of infection control practices.

Consider:

Why would you NOT change practice, based on these articles?

In response to the original question there needs to be more studies conducted in order to determine if there should be a change in practice or not. Although these articles all help to verify that some degree of improvement needs to be made, it is ultimately difficult to determine how this would be done. In addition, one of these articles gathered data from a variety of healthcare individuals and was not specific to Paramedic practice, so this must be taken into consideration when drawing conclusions. Not to mention that the majority of the methodology's which were used all presented with a risk for biases, since they are based on the participants truthfulness and opinions. Two of these articles also relied on convenience sampling, which can lead to an inaccurate representation of the data.

Clinical Bottom Line:

Research suggests that frontline responders, specifically paramedics could benefit from additional training, management and planning on infection control procedures/protocol. Paramedics expressed a need for better preparation in response to highly infectious diseases. Continuing education will not only ensure proper implementation of current infectious control practices but will ultimately improve patient care and also protect workers.

References

Harris, S., et al. (2010). Occupational exposures in emergency medical service providers and knowledge of and compliance with universal precautions. *American Journal of Infection Control, 3*8(2), 86 – 94. https://doi.org/10.1016/j.ajic.2009.05.012

Le Aurora B. et al. (2018). Determining training and education needs pertaining to highly infectious disease preparedness and response: A gap analysis survey of US emergency medical services practitioners. *American Journal of Infection Control, 46*(3), 246 – 252. https://doi.org/10.1016/j.ajic.2017.09.024

Roberts, K. A., & Bryce, E. (2015). Pandemic preparedness of B.C paramedics. *Canadian Journal of Infection Control, 30*(4), 225-231. http://ezpxy.fanshawec.ca/login?url=http://search.ebscohost.com/login.aspx?direct=true&db=cin20&AN=112265734