**Appendix 3. Study Characteristics**

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| **Author(s) and**  **Country of Origin** | **Year** | **Methodology** | **Population** | **Key Findings** | **Themes** |
| Ashburn et al.,  United States | 2019 | Retrospective  Cohort Study | 3,085 Patients who  received out-of-hospital naloxone by paramedics | The authors discovered that Opioid overdose identified by receiving out-of-hospital naloxone with clinical improvement carries a 13-fold increase in mortality compared to the general population. They conclude that continued care after opioid overdose must move beyond out-of-hospital and immediate hospital post reversal care. Potentially useful resources such as community paramedicine, and drug therapies such as buprenorphine are suggested | Mortality, SODOS,  Generic Paramedic Role,  OAT |
| Barefoot et al.,  United States | 2021 | Retrospective  Cohort Study | 218 Patients who died from  unintentional opioid  overdose | Authors found that of the 218 individuals who died from unintentional opioid overdose in the study interval, 30% (n=66) utilized EMS in the year before their death and 17% (n=38) had at least one EMS encounter with documented drug or alcohol use. Results highlight that EMS encounters may present an opportunity to identify individuals at-risk of opioid overdose and, ultimately, reduce overdose mortality | Mortality, Generic Paramedic  Role |
| Barton et al.,  United States | 2002 | Prospective Cohort Study | 30 Patients who presented  with altered mental status,  as “found down”, or with  suspected opioid overdose | Results of this one-month small sample size study highlight that intranasal naloxone may provide a safe, rapid, effective way to manage suspected opioid overdoses in the field. | Naloxone |
| Barton et al.,  United States | 2005 | Prospective Cohort Study | 95 patients who presented  with altered mental status,  as “found down”, or with  suspected opioid overdose | Provides support for IN naloxone delivery in place  of intravenous naloxone delivery for paramedics attending suspected opioid overdose. The wide spectrum diagnoses in this patient cohort likely obscures the true effect of naloxone. | Naloxone |
| Belz et al.,  United States | 2009 | Retrospective  Cohort Study | 164 cases which were coded  by paramedics as overdoses  and where naloxone was  administered by paramedics | Introducing IN naloxone as an agent for BLS  providers to administer to patients suffering opioid overdose as a  safe and efficient solution. At the time of this study BLS providers in this region were not permitted to administer naloxone. | Naloxone |
| Bergstein et al.,  United States | 2021 | Qualitative Study  Semi-Structured Interviews  Focus Groups | 20 PWUD and 8 paramedics | Standard of care by EMS providers following overdose should include treatment for withdrawal symptoms,  including buprenorphine induction, patient-centered communication, and effective linkage to prevention, treatment, and harm reduction services | SODOS, Empathy/Attitudes,  Generic Paramedic Role |
| Bessen et al.,  United States | 2019 | Qualitative Study  Semi-Structured Interviews | 76 people who use opioids\* and  36 paramedics | Identified opportunities to address  misconceptions about naloxone and challenges in accessing  naloxone, which may improve opioid overdose prevention strategies. opioid users and emergency responders’ perceptions about naloxone may limit the optimal use of naloxone within the community. | Generic Paramedic Role,  Empathy/Attitudes |
| Bettano et al.,  United States | 2022 | Cross-Sectional Study | 35,868 opioid-related cases | Among opioid-related runs, women had 24% lower odds (95% CI 0.68–0.86) of appearing in the dead-on arrival category and 20% lower odds (95% CI 0.78–0.82) of appearing in the acute opioid overdose category than men. Women further had 18% lower odds (95% CI 0.76–0.89) of receiving naloxone than men | Naloxone, Generic Paramedic  Role |
| Blue et al.,  United States | 2021 | Consensual  Qualitative Research Utilising  2-question survey at EMS  conference | 123 paramedic surveys | Participants in this study reported that education and increased  access to treatment facilities and appropriate pain management,  along with recognition of the role of social determinants of health  in opioid dependency, were necessary steps to address the opioid crisis | Generic Paramedic Role,  Empathy/Attitudes |
| Cantwell et al.,  Australia | 2005 | Retrospective Cohort Study | 7985 non-fatal heroin overdose  cases | There is a link between initial patient  presentation and the dose of naloxone required for resuscitation.  Patients with high initial respiratory rates, or who present with a  moderately affected conscious state, can be returned to a normal  physiological state with ventilation and standard, or less  than standard doses of naloxone | Naloxone |
| Cardone et al.,  Canada | 2018 | Retrospective Cohort Study | 294 patients treated with  naloxone by paramedics | The primary difference between patients managed with a known  history of overdose and those without was found to be a lower  likelihood of patients without a history of overdose achieving a  GCS of > 10, and higher rates of intubation in this group. | Naloxone |
| Carroll et al.,  United States | 2021 | Case Series | 18 patients treated with  Buprenorphine by paramedics  following overdose | Of the eighteen patients enrolled in Bupe FIRST EMS at the time  of this manuscript, all had improvement in symptoms following  buprenorphine treatment, without any signs of precipitated withdrawal. | OAT |
| Cash et al.,  United States | 2018 | Retrospective Cohort Study | 319,559 suspected overdose  cases | Analysis of a national database of EMS events found that from 2012 to  2016, the rate of naloxone administrations increased 75.1%, from 573.6  to 1004.4 per 100,000 EMS events, mirroring a 79.7% increase in the  age-adjusted opioid mortality rate. | Research/Data |
| Champagne-Langabeer et al.,  United States | 2020 | Narrative Review | 27 Community-based, post-opioid overdose EMS programs across the United States | Paramedics have an important role in connecting patients to care, but the utility of referral programs following overdose are unclear and poorly reported. | Paramedic-led harm reduction; Alternative care pathways; Safety of discharge on scene; Generic paramedic role |
| Charbonneau et al.,  Canada | 2016 | Retrospective Call Report Review | 244 Paramedic placed naloxone requests to base hospital physicians | Removing online medical direction for Naloxone from the ALS-PCS medical directive for opioid toxicity if combined with updated paramedic education. | Naloxone |
| Chou et al.,  United States | 2017 | Systematic Review | 7 RCT and cohort studies where patients received naloxone by paramedics in the out-of-hospital environment | Higher-concentration intranasal naloxone (2 mg/mL) seems to have  efficacy like that of intramuscular naloxone for reversal of opioid overdose, with no difference in adverse events | Naloxone |
| Cone et al.,  United States | 2020 | Survey | 60 physicians who are  members of the Council of EMS Fellowship Directors | COVID-19 has been associated with reports of increased opioid  overdose and use of naloxone in approximately 20% and decreased events in 40% of settings around the US. | Naloxone |
| Coomber et al.,  Australia | 2019 | Retrospective Cohort Study | 205,178 paramedic attended events where  substance use was involved | Paramedics recorded acts of aggression and/or violence in 11,813  (5.76 %) of these attendances. | Generic Paramedic Role |
| Davis et al.,  United States | 2014 | Systematic Review | 50 EMS Scope of practice from U. S. states, the District of Columbia, Guam, and Puerto Rico | There is wide variation between states regarding EMS naloxone dosing protocol and route of administration. At the time of review only 13 states permit EMTs and only three  permit EMRs to administer naloxone. | Naloxone |
| Do et al.,  Canada | 2018 | Proof-of-concept study | 86 patients treated with naloxone by paramedics | Significant spikes in paramedic responses to opioid-related events in Ottawa were detected in advance of media reports. Paramedic response data can potentially provide a novel data source for monitoring public health events | Research/Data |
| Duk et al.,  United States | 2020 | Survey | 105 EMS providers | Only 38% of responders believed that they could positively impact the opioid epidemic. Stigma and misconceptions regarding naloxone remain common among medical providers, including emergency medical service (EMS) members. | Empathy/Attitudes |
| Farkas et al.,  United States | 2019 | Retrospective Cohort Study | 272 patients treated with naloxone by paramedics | In opioid overdose patients treated with naloxone by first responders, poor neurological status on paramedic arrival is associated with additional  naloxone administration but does not predict need for hospitalization. | Naloxone |
| Farkas et al.,  United States | 2021 | Retrospective Cross-Sectional  Study | 359 patients treated with naloxone by paramedics | A higher total dose of naloxone and polysubstance intoxication  with additional CNS depressants were predictors of hospital admission | Naloxone |
| Faul et al.,  United States | 2015 |  |  | Naloxone is less often administered by EMT-basics. In most states,  the scope-of-practice model prohibits naloxone administration by  basic EMTs. Reducing this barrier could help prevent drug overdose death | Naloxone |
| Faul et al.,  United States | 2017 | Retrospective Cohort Study | 95,012 patients treated with  naloxone by paramedics | This study shows that frequency of MNA is growing overtime  and is regionally dependent. MNA may be a barometer of the potency of the opioid involved in the overdose. | Naloxone |
| Friedman et al.,  United States | 2016 | Prospective Cohort Study | 249 patients with drug-related  altered mental status | Only 44.2 %of patients who met criteria were administered  naloxone in this study. Possible explanations for this discrepancy include lack of appropriate training, certification, licensure, or lack of direct medical oversight | Naloxone, Generic Paramedic  Role |
| Gjersing et al.,  Norway | 2015 | Prospective Cohort Study | 172 people who inject drugs street-recruited in 1997 and followed-up until the end of 2004 | There is a significantly elevated mortality risk in critical time-periods  after an individual had been treated by ambulance services for an overdose. The risk remained significantly elevated even 5 years after an attendance. | Mortality |
| Gjersing et al.,  Norway | 2016 | Retrospective Cohort Study | 231 people who inject drugs who died from an overdose | Screening for drug use among emergency service attendees may be a way to identify those at risk of overdose death and enable the introduction of additional interventions | Mortality |
| Glenn et al.,  United States | 2020 | Retrospective Cohort Study | 164 and 153 patients who were treated with naloxone by paramedics before and after awareness of COVID-19 respectively | More than a two-fold increase in the rate of refusal after  non-fatal opioid overdose was observed following the COVID-19 outbreak. | Mortality, SODOS |
| Glober et al.,  United States | 2020 | Survey | 33 medical directors from  California local EMS agencies | California medical directors are uniformly aware of the impact of the opioid epidemic. Protocols widely adopted for naloxone administration, re-dosing, and use by law enforcement, consistent with the national standard of practice. | Generic Paramedic Role,  Naloxone |
| Greene et al.,  Canada | 2019 | Systematic Review | 7 studies that evaluated SODOS following paramedic administration of naloxone | Mortality or serious adverse events due to suspected rebound  toxicity in patients released on scene post-EMS treatment with naloxone were rare. However, studies involving longer-acting opioids were rare and no study involved fentanyl | SODOS, Mortality |
| Grover et al.,  United States | 2018 | Retrospective Cohort Study | 4,758 patients treated for overdose  by paramedics | Among patients receiving care in this large urban EMS system in the United States, the overall sensitivity and positive predictive value for naloxone administration for identifying opioid overdoses was low. | Naloxone, Generic Paramedic  Role |
| Gulec et al.,  United States | 2018 | Retrospective Cohort Study | 3,219 patients who were treated  with naloxone by paramedics | BLS providers were as effective as ALS providers in improving  patient outcome measures after naloxone administration and in identifying patients for whom administration of naloxone is appropriate. | Naloxone |
| Hallowell et al.,  United States | 2021 | Development & Evaluation of  Case Definition | 400 randomly selected cases where naloxone was administered by paramedics | EMS data can be an effective tool for monitoring overdoses in real time and informing public health practice. To accurately identify opioid overdose related EMS runs, the use of a comprehensive case definition is essential. | Research/Data |
| Harris et al.,  United States | 2020 | Retrospective Cohort Study | 243 patients who were treated with naloxone by paramedics | A single large prehospital IM dose of naloxone reversed the toxicity  of suspected heroin overdose in most patients treated with naloxone by this route. | Naloxone |
| Hatten et al.,  United States | 2014 | Thesis. Ecological Study | 52014 patients who were treated with naloxone by paramedics | There is a wide degree of county-to-county variation in prehospital  l naloxone use. Both EMS and sociodemographic factors appear to serve as predictors of naloxone administration. | Naloxone |
| Haug et al.,  United States | 2016 | Qualitative Analysis | 368 individuals including  paramedics who posted on twitter about naloxone | The highest levels of burnout, fatigue, and stigma regarding naloxone and opioid overdose were among nurses, EMTs, other health care providers, and physicians | Empathy/Attitudes |
| Hern et al.,  United States | 2021 | Editorial | N/A | By encouraging hospitals to become Overdose Receiving Centers  and then bringing patients to those facilities preferentially, EMS has the chance to have a major role in the treatment of opioid use disorder. | Generic Paramedic Role/Alternative Care  Pathways |
| Jeffrey et al.,  United States | 2017 | Proof-of-concept study | N/A | Non-professional agencies may need to expand their protocols to  include the provision of naloxone for patients with acute opioid toxicity. If permitted, intranasal naloxone may be a reasonable and safe alternative to IV naloxone | Naloxone |
| Jenkins et al.,  United States | 2021 | Retrospective Cohort Study | 2,580 patients who were treated with naloxone by paramedics | Naloxone was administered to individuals without respiratory  depression in nearly one-half of all cases. Naloxone is a relatively safe medication with few complications in those without opioid dependence. However, the administration of naloxone to those with opioid dependence may precipitate withdrawal. | Naloxone |
| Johnston et al.,  United Kingdom | 2021 | Multi-site Feasibility Trial | 4 patients who were treated  with naloxone and subsequently supplied THN by paramedics | Most eligible patients presented with a reduced  consciousness level, preventing recruitment 73% (n=42/48). The lowered consciousness levels of prehospital emergency ambulance patients who present with opioid poisoning, often prevent the delivery of training required to enable the supply of THN. | Paramedic-led harm  reduction |
| Joiner et al.,  United States | 2021 | Editorial | N/A | EMS agencies must closely partner with key stakeholders to develop mechanisms to end the pervasive repeating cycle of emergency care interventions followed by immediate return to drug dependence behaviors, life-threatening overdoses, and related complications. | Generic Paramedic Role/Alternative Care  Pathways/Paramedic-led Harm Reduction |
| Jones et al.,  Australia | 2019 | Retrospective Cohort Study | 3282 paramedic-attended  methamphetamine-related  events | Findings suggest the need for targeted prevention and treatment  programs rather than further spending on legislation and policing which are of minimal benefit | Generic Paramedic Role |
| Jones et al.,  Australia | 2021 | Cross-Sectional Survey | 154 police officers and 63  paramedics | Participants agreed meth-amphetamine users deserve and are  entitled to the same medical care as other patients despite perceiving drug users as personally responsible for their drug use | Empathy/Attitudes |
| Kelly et al.,  Australia | 2005 | Randomized Control Trial | 155 patients who were treated with either IM or IN naloxone by paramedics | Naloxone for IN use may be an appropriate form in which this  drug could be made more widely available, as it has significant advantages over other forms. An IN form of naloxone would eliminate the need for needles, thereby reducing risks of blood-borne virus transmission. | Naloxone |
| Kerr et al.,  Australia | 2008 | Systematic Review | 7 studies that evaluated out-  of-hospital IN naloxone administration | There is increasing evidence that the IN route may be useful for  the administration of naloxone in cases of opioid overdose. | Naloxone |
| Keseg et al.,  United States | 2019 | Consensus Guideline | 78 EMS medical directors | EMS agencies must also closely partner with key stakeholders to  develop mechanisms to end the pervasive repeating cycle of emergency care interventions followed by immediate return to drug dependence behaviors, life-threatening overdoses, and related complications. | Generic Paramedic Role/  Paramedic-led Harm Reduction, Alternative Care Pathways |
| Khoury et al.,  United States | 2021 | Retrospective Time Series  Study | Patients who were treated with  naloxone by paramedics | This study reports an increase in both occurrence and severity  of opioid overdoses during the COVID-19 pandemic. Additional research on the use of EMS data on naloxone administrations and multiple naloxone administrations to monitor opioid overdoses is encouraged. | Naloxone |
| Kilwein et al.,  United States | 2019 | Mixed Methods | 854 surveyed paramedics and  20 focus group-attended paramedics | Support for permitting BLS personnel to administer naloxone,  specifically given the percentage of BLS that feel confident in managing an opioid overdose despite not receiving training in this area. | Naloxone, Empathy/Attitudes |
| Kinsman et al.,  United States | 2018 | Systematic Review | 52 US Jurisdictions Legal Scope  of EMS Practice | The number of states authorizing EMTs and EMRs to administer an  opioid antagonist has increased greatly over the past 3 and 1/2 years. | Naloxone |
| Klebacher et al.,  United States | 2017 | Retrospective Cohort Study | 266 patients who were treated  with naloxone by paramedics | Patients with an opioid OD can be successfully reversed with IN  naloxone provided by first responders. Patients who fail to achieve a GCS of 15 warrant further evaluation by advanced providers. | Naloxone |
| Kolinksy et al.,  United States | 2017 | Literature Review | 5 Studies with a combined pool  of 3875 patients who were  treated and released by paramedics | Existing literature suggests a treat and release policy for suspected  prehospital opioid overdose might be safe, but additional research  should be conducted in a prospective design. | SODOS/Mortality |
| Kruis et al.,  United States | 2020 | Qualitative Analysis | 743 paramedic, nursing, and  criminology students | Work shows that social stigma toward drug users is moderately high  among persons whose work does or will involve providing support to such persons. | Empathy/Attitudes |
| Kruis et al.,  United States | 2021 | Qualitative Analysis | 282 paramedics | First responders held slightly negative attitudes toward the use of MAT. Dimensions of stigma exhibit a negative relationship with attitudes toward MAT, while support for the disease model of addiction was associated with positive perceptions | Empathy/Attitudes |
| Levine et al.,  United States | 2016 | Retrospective Cohort Study | 205 patients who were treated  with naloxone by paramedics | The practice of receiving pre-hospital naloxone by paramedics and  subsequently refusing care is associated with an extremely low short- and intermediate-term mortality. | SODOS/Mortality |
| Lindstrom et al.,  United States | 2015 | Retrospective Cohort Study | 1,812 patients who were treated with naloxone by paramedics | There is a temporal relationship between the EMS and ED data on  opiate ODs. In this regard, the use of EMS naloxone administration as  a surrogate marker for community opiate use appears to hold true. | Naloxone, Research and Data |
| Lund et al.,  United States | 2013 | Prospective Cohort Study | 2054 PWUD, 686 patients who  were treated with naloxone by paramedics | The highest 5-year mortality rates existed amongst those treated  by ambulance. The patients had high mortality compared with the general population. | Mortality |
| Maragh-Bass et al.,  United States | 2017 | Qualitative Analysis | 22 paramedics | Participants recognized their unique position as first responders to  deliver motivational, harm-reduction messages to substance-using patients during transport. With incentivized training, implementing this program could be life- and cost-saving, improving emergency and behavioral health services. | Empathy/Attitudes |
| Marks  United Kingdrom | 2010 | Qualitative Analysis | 45 school-aged children | There was a statistical significance in the differences pre- and post-test  for the response of ringing 999 and responses to the actions they would take and why. This suggests a positive effect of the programme. | Paramedic-led Harm Reduction, Generic paramedic role |
| McCann et al.,  Australia | 2018 | Qualitative Analysis | 73 paramedics | Extending paramedics role could potentially benefit people with these  problems by improving the quality of care, reducing the need for ED conveyance, and decreasing clinician workload in these departments. Paramedics need more undergraduate and in-service education about the care of patients with mental health and or alcohol or drug problems. | Empathy/Attitudes, Generic  Paramedic Role, Paramedic-led Harm Reduction, Alternative Care Pathways |
| Mcdermot et al.,  Ireland | 2012 | Randomized Control Trial | 18 paramedic students | Amongst advanced paramedic trainees, the IN route of medication  administration is significantly faster, better accepted and perceived to be safer than using the IV route. Thus, IN medication administration could be considered more frequently when administering emergency medications in a pre-hospital setting | Naloxone |
| Merlin et al.,  United States | 2010 | Retrospective Cohort Study | 344 patients who were treated  with naloxone by paramedics | Intranasal naloxone is statistically as effective as IV naloxone at  reversing the effects of opioid overdose. Twice as many patients in the IN group were given second doses, as compared with the IV group. The decision to re-dose is very subjective and may represent the inability to wait for the full desired clinical response | Naloxone |
| Moallef et al.,  Canada | 2021 | Prospective Cohort Study | 540 PWUD | Community-recruited PWUD who witnessed an overdose event called  EMS approximately half of the time. GSLs did not seem to improve EMS calling and individuals living in SROs were less likely to call EMS. | Empathy/Attitudes |
| Montoy et al.,  United States | 2022 | Qualitative Analysis | 150 paramedics | Health professionals' attitudes toward substance use have changed  in the past few decades as harm reduction has gained broader acceptance and substance use treatment has become more integrated into emergency health care | Empathy/Attitudes |
| Moore et al.,  United Kingdom | 2015 | Cluster Randomized Controlled  Trial | Patients who were treated  with naloxone and subsequently supplied THN by paramedics | Drug taking or help seeking behaviours may be altered by the provision of the kits and evidence is required to underpin widespread implementation of this new route for THN. | Paramedic-led Harm Reduction |
| Nugent et al.,  United States | 2018 | Retrospective Cohort Study | 131 patients who were treated  with naloxone by paramedics | Patients treated by BLS providers carrying naloxone received the  medication in significantly less time than patients treated by BLS providers without naloxone who waited for ALS arrival, an average of 7.8 minutes faster | Naloxone |
| Pegano et al.,  Canada | 2018 | Qualitative Analysis | 20 paramedic students | Results from this study suggest that in general, empathy levels  among paramedic students decline over the course of their education. | Empathy/Attitudes |
| Peprah et al.,  Canada | 2020 | Literature Review | 2 included studies | Research considering the various routes of naloxone administration  and different delivery devices are needed. Such studies should also examine the impact of a wider variety of opioids including the relatively new and more potent synthetic opioids to comprehensively respond to the research questions under review. | Naloxone |
| Ray et al.,  United States | 2018 | Retrospective Cohort Study | 4726 Patients who were treated with naloxone and subsequently supplied THN by paramedics | Among patients administered naloxone for opioid overdose, those  with repeat non-fatal opioid overdose events are at a much higher risk of mortality, particularly drug-related mortality, than those without repeat events. | Mortality |
| Redfield et al.,  United States | 2016 | Systematic Review | 50 US States | 32 states permit EMT-Bs to administer naloxone. | Naloxone |
| Robertson et al.,  United States | 2009 | Retrospective Cohort Study | 154 patients who were treated  with naloxone by paramedics | IN naloxone offers a needleless alternative that may be lifesaving  or spare a patient intubation if IV access cannot be quickly established. | Naloxone |
| Saunders et al.,  United States | 2019 | Qualitative Analysis | 18 first responders,  (Paramedics n=6) | interventions addressing trauma and burnout are necessary to  support emergency personnel, while expanded harm reduction and treatment access are critical to support those who experience opioid overdose in NH | Empathy/Attitudes |
| Scharf et al.,  United States | 2021 | Retrospective Cohort Study | 239 Patients who were treated with naloxone by paramedics | NLB initiatives can potentially augment existing community-based  naloxone training structures, thus widening the scope of the life-saving drug, and reaching those most at risk of dying from an opioid overdose. | Naloxone, Paramedic-led  Harm Reduction |
| Skulberg et al.,  Norway | 2022 | Randomized Control Trial | Patients who were treated with  naloxone by paramedics | Intranasal naloxone (1.4 mg/0.1 mL) was less efficient than 0.8 mg  intramuscular naloxone for return to spontaneous breathing within 10 minutes in overdose patients in the pre-hospital environment when compared head-to-head. | Naloxone |
| Smith et al., | 2017 | Retrospective Cohort Study | 85 patients who were treated  with naloxone by paramedics and who had ETCO2 monitoring | Controlling for dose of naloxone, ETCO2 was a better measurement  for response to naloxone than GCS | Naloxone |
| Smith et al.,  Canada | 2022 | Retrospective Cohort Study | 558 paramedic-attended  overdose events | Only 22% of identified opioid overdoses were treated by a paramedic  with naloxone and each year, a smaller proportion of cases were treated with PNA despite increasing annual overdose numbers. | Naloxone |
| Smith-Bernadin et al.,  United States | 2017 | Retrospective Cohort Study | 2723 post-overdose patients  conveyed to sobering centre by  paramedics | Sobering center are an appropriate alternate destination. Most patients referred were appropriate for the level of support provided, and did not require transfer to the ED | Alternative Care Pathways |
| Snooks et al.,  United Kingdom | 2011 | Mixed-Methods | PWUD | Death rates may be reduced by take-home naloxone; bystander CPR;  treatment for addiction; naloxone implants | Paramedic-led Harm  Reduction, Generic Paramedic Role, Naloxone |
| Soderqvist et al.,  Finland | 2019 | Retrospective Cohort Study | 57 PWUD | Oral fluid screening for illicit substances can be a valuable diagnostic  c tool in addition to the usual diagnostic methods in EMS patients with unconsciousness due to an unknown cause or intoxication | Generic Paramedic Role |
| Stam et al.,  Australia | 2018 | Retrospective Cohort Study | 3921 paramedic-attended  overdose events | The treatment of uncomplicated heroin overdose in the out-of-hospital environment was safe in terms of mortality, irrespective of whether naloxone had been administered and that whether transported to hospital or not, death occurred because of a subsequent and unrelated heroin overdose | Mortality/SODOS |
| Stoove et al.,  Australia | 2009 | Retrospective Cohort Study | 4884 paramedic-attended  overdose events | Experiencing a non-fatal overdose substantially increases the risk of  subsequent overdose mortality. | Mortality/SODOS |
| Tanghlerini et al.,  United States | 2016 | Retrospective Cohort Study | 59 PWUD | Frequent users of EMS suffer from disproportionate comorbidities,  particularly substance use\* and psychiatric disorders. This population responds well to the intervention of a specially trained paramedic as measured by EMS usage | Paramedic-led Harm Reduction, Generic paramedic role |
| Thompson et al.,  United States | 2022 | Retrospective Cross-Sectional  Study | 218 patients who were treated  with naloxone by paramedics | Treatment of prehospital opioid overdose using intranasal naloxone  at an initial dose of 0.4 mg was equally effective during the prehospital period as treatment at an initial dose of 2 mg, was associated with a lower rate of adverse effects, and represented a 79% reduction in cost. | Naloxone |
| Tobin et al.,  United States | 2005 | Qualitative Analysis: Survey | 327 paramedics | Overall attitudes toward training drug users to administer naloxone  were negative with 56% responding that this training would not be effective in reducing overdose deaths. | Empathy/Attitudes |
| Togia et al.,  Greece | 2008 | Retrospective Cohort Study | 5,836 substance use\* related  events | Substance use\* related calls represent a significant load for emergency  medical services in metropolitan areas, representing 2% of all emergency calls | Generic Paramedic Role |
| Tukel et al.,  United States | 2022 | Clinical Trial | 55 PWUD experiencing an OOH  overdose | A drone can travel several ranges of straight-line  distance faster than an ambulance | Naloxone |
| Tylleskar et al.,  Norway | 2020 | Prospective Observational Study | 2,215 patients treated with  naloxone by paramedics | Intramuscular naloxone doses of 0.4 and 0.8 mg were effective and safe in the treatment of opioid overdose in the prehospital setting. Emergency medical staff appear to titrate naloxone based on clinical presentation | Naloxone |
| Vilke et al.,  United States | 2003 | Retrospective Cohort Study | 998 patients treated with  naloxone by paramedics | Giving naloxone to patients with heroin overdoses in the field  and then allowing them to sign out AMA resulted in no identifiable deaths within this study population | Naloxone/SODOS/Mortality |
| Wagner et al.,  United States | 2019 | Qualitative Analysis | 11 PWUD | To maximize effectiveness of innovative intervention strategies to  reduce opioid overdose deaths it is imperative to center the perspectives of PWUD when designing interventions | Empathy/Attitudes |
| Walsh et al.,  United States | 2013 | Retrospective Cohort Study | 230 elderly patients who were  treated with naloxone by paramedics | More than 75% of elderly patients treated with naloxone are not hypoventilating, suggesting that it is being administered for other reasons - probably altered mental status. | Naloxone |
| Wampler et al.,  United States | 2011 | Retrospective Cohort Study | 592 patients who were treated  with naloxone by paramedics | The primary outcome was that no patients who were treated with naloxone for opioid overdose and then refused care were examined by the MEO within a 48-hour time frame. | SODOS/Mortality |
| Weber et al.,  United States | 2011 | Retrospective Cohort Study | 105 patients who were treated  with naloxone by paramedics | Nebulized naloxone is a safe and effective needleless alternative for  prehospital treatment of suspected opioid overdose in patients with spontaneous respirations | Naloxone |
| Weiner et al.,  United States | 2017 | Retrospective Cohort Study | 793 patients who were treated  with naloxone by paramedics | BLS administration of IN naloxone is a safe practice and offer us  experience as a potential model for other EMS systems and only a small percentage of patients receiving prehospital administration of nasal naloxone by BLS providers required additional doses of naloxone in the ED | Naloxone |
| Weiner et al.,  United States | 2017 | Retrospective Observational  Study | 12,192 patients who were  treated with naloxone by paramedics | Patients who survive opioid overdose should be considered  extremely high risk and should receive interventions such as offering buprenorphine, counseling, and referral to treatment prior to ED discharge. | Mortality/SODOS |
| Weiner et al.,  United States | 2022 | Retrospective Observational  Study | 9,734 patients who were treated with naloxone by paramedics | Our study demonstrates that the 1-year mortality of patients who  received naloxone by EMS is quite high. About 1 in 12people (8.3%) died within 3 days, and an additional 1 in 15(6.9%) died between 4 days and 1 year. | Mortality/SODOS |
| Wichmann et al.,  Denmark | 2012 | Prospective Cohort Study | 4762 patients who were treated  with naloxone by paramedics | Prehospital opioid overdose was associated with a mortality of 8.4%  within 48 h, and 85% of the deaths (66/78) were on scene. | Mortality/SODOS |
| Williams et al.,  Australia | 2015 | Prospective Cross-Sectional  Longitudinal Study | 554 paramedic and nursing  students | Patients presenting with substance use\* had the lowest regard,  with first year students showing the lowest regard and second year students showing the highest regard. | Empathy/Attitudes |
| Williams-Yuen et al.,  Canada | 2020 | Qualitative Analysis | 10 paramedics | Paramedics felt highly confident in providing clinical care, but their  capacity to address underlying causes of drug use was understood as much more limited. | Empathy/Attitudes |
| Willman et al.,  United States | 2017 | Literature Review | People who use heroin | The risk of death in patients with short-acting opioid over-dose treated  with naloxone is very small. Any deaths are more likely attributable to additional opioid use than to rebound toxicity. | Mortality/SODOS |
| Wosiki-Kuhn et al.,  United States | 2020 | Retrospective Cohort Study | 3,099 patients who were treated with naloxone by paramedics | Patients who refuse transport after prehospital naloxone are not at  higher risk of death by one-year than those who are transported to a hospital | Mortality/SODS |
| Wright et al.,  United States | 2018 | Qualitative Analysis | 506 EMS agencies | the IN route was the most used route of Naloxone  administration in the out-of-hospital setting. IV was the second most used route. IM / SQ administration was lesscommon. | Naloxone |
| Yousefifard et al.,  Iran | 2020 | Systematic Review | Patients who were treated with  naloxone by paramedics | intranasal naloxone is as effective as injectable naloxone in the  pre-hospital management of opioid overdose complications. Consequently, intranasal naloxone may be an appropriate alternative to injectable naloxone | Naloxone |
| Zhang et al.,  United States | 2018 | Mixed-Methods | 117 paramedics | Found an improvement in opioid overdose and related legislation  knowledge among 117 EMTs from seven rural and frontier counties of Nevada. | Generic Paramedic Role |
| Zozula et al.,  United States | 2022 | Retrospective Cohort Study | 1,131 patients who were treated  with naloxone by paramedics | Non-transport after prehospital naloxone administration is  associated with an increased risk of subsequent non-fatal overdose requiring EMS intervention | Mortality |