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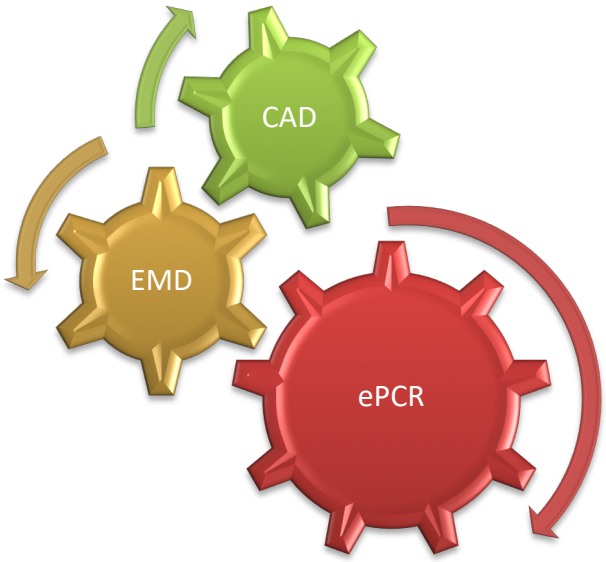
Recommendations for Surveillance of EMS Data for Opioid Overdoses

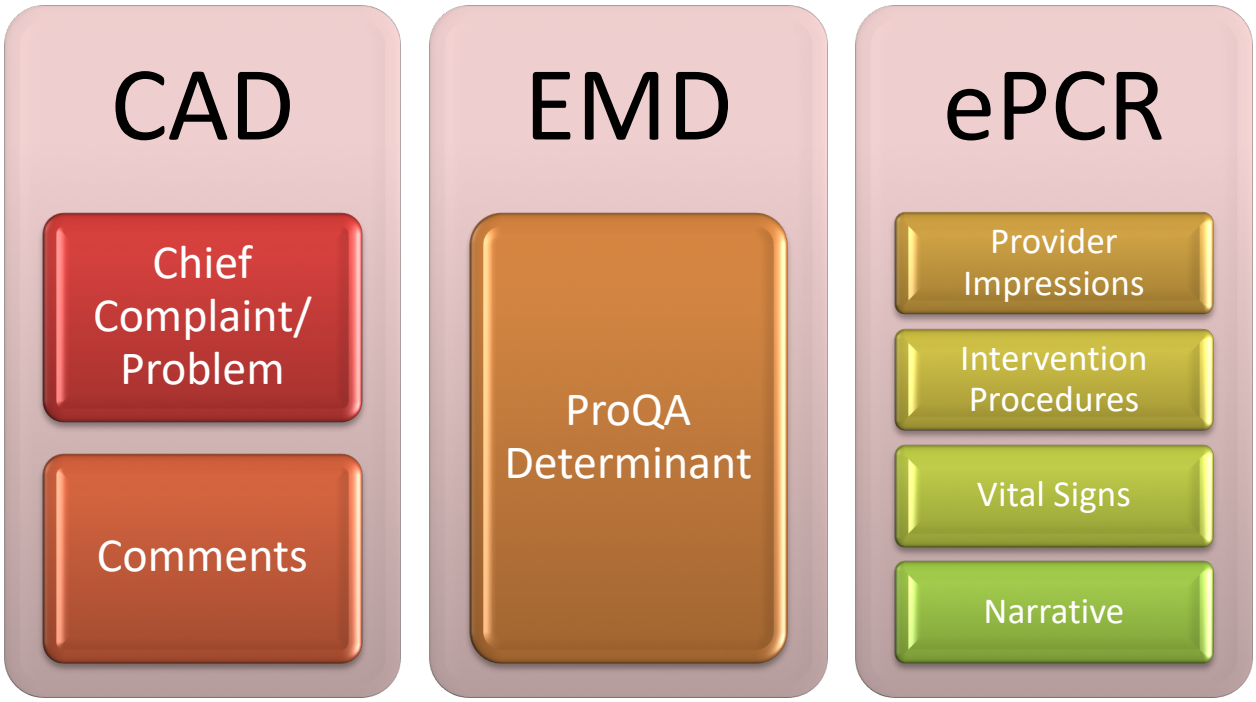
(To learn more about FirstWatch and this project, please see the end of this document. To be sure you are seeing the latest information, please visit: www.firstwatch.net/finding-opioid-data)

Emergency Medical Service (EMS) data has been successfully employed in the past to complement opioid overdose surveillance data provided by the traditional routes. While EMS data still has the limitation of being non-standardized and dependent on the documentation of the EMS provider; it has the advantage of providing information on non-fatal overdoses that would and could not be captured elsewhere. While EMS data in reality starts from a 911 dispatch with a Computer Aided Dispatch (CAD) and in many communities, a call taking set of protocols and guidelines using ProQA or other Emergency Medical Dispatch (EMD) system, moving to an Electronic Patient Care Record (ePCR) rarely are able to trace the entire path that a single 911 call generates within data sources (Diagram 1). Correctly identifying an Opioid Overdose continues to be a challenging task. Its clinical features are non-specific and EMS providers can easily be deceived on the true underlying cause of the present illness. Identifying a set of indicators of overdose that provide key elements throughout the entire EMS data sources can provide a more robust understanding of opioid overdose surveillance within the EMS context.

Diagram 1: Emergency Medical Services (EMS) Data sources.



As EMS data is noted to be a typically “dirty” data source of information, in order to mine it for overdose data, one must look in non-standard locations. With that in mind, we have created a set of clinical indicators of overdose that illustrate the acknowledgement of key Data Elements through the entire EMS data (Diagram 2).



From the above described Data Elements, we have extracted from the CAD system a Chief Complaint or Problem of Overdose/Poisoning ingestion, along with a free text search in the comment section for overdose related keywords. To complement the CAD information, from the EMD we used a ProQA determinant of Protocol 23: Overdose/Poisoning (Ingestion). From the ePCR we obtained a Primary and Secondary Impression of Overdose along with a free text search in the Narrative for any opioid overdose related keyword. We used the identical set of keywords in both the CAD-Comments and ePCR-Narrative free text search (Table 1). An intervention of Narcan/Naloxone administration as well as vital signs where included. From the vital signs we used an altered mental status determined by a Glasgow Coma Score (GCS) of less than or equal to 13 and a decreased Respiratory Rate (RR) rated of less than or equal to 12 per minute.

Diagram 2: Data Elements to identify Opioid Overdose Calls within EMS Data sources

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Opioid Overdose Data Mining Data Element Descriptions per EMS Data Source FirstWatch Solutions				
Data Source	**Data Element**	**Nemsis 3.3.4 Field**	**Nemsis 3.3.4 Code**	**Description**
CAD	Chief Complaint/ Problem	[eDispatch.01]	2301053	Overdose/Poisoning/Ingestion
			2301077	Unconscious/Fainting/Near-Fainting
	Comments	Free text keyword search	N/A	List of Opioid related Keywords
EMD	EMD Determinant, ProQA Determinant	[eDispatch.03]	N/A	Card '23%'
			N/A	Card '31%'
ePCR NEMSIS 3.3.4	Primary Impression	[eSituation_11]	T40.1%	Poisoning by and adverse effect of heroin
			T40.2	Poisoning by, adverse effect of and underdosing of other opioids
			T40.3%	Poisoning by, adverse effect of and underdosing of methadone
			T40.4%	Poisoning by, adverse effect of and underdosing of other synthetic narcotics
			T40.6%	Poisoning by, adverse effect of and underdosing of other and unspecified narcotics
			T50.90	Poisoning by, adverse effect of and underdosing of unspecified drugs, medicaments and biological substances
			R41.8	Other symptoms and signs involving cognitive functions and awareness
			R46.4	Slowness and poor responsiveness
	Secondary Impression	[eSituation_12]	T40.1%	Poisoning by and adverse effect of heroin
			T40.2	Poisoning by, adverse effect of and underdosing of other opioids
			T40.3%	Poisoning by, adverse effect of and underdosing of methadone
			T40.4%	Poisoning by, adverse effect of and underdosing of other synthetic narcotics
			T40.6%	Poisoning by, adverse effect of and underdosing of other and unspecified narcotics
			T50.90	Poisoning by, adverse effect of and underdosing of unspecified drugs, medicaments and biological substances
			R41.8	Other symptoms and signs involving cognitive functions and awareness
			R46.4	Slowness and poor responsiveness
	Narcan Administration - PTA	[eMedications_02]	N/A	Narcan/Naxone
	Narcan Administration - Crew	[eMedications_03]	N/A	Narcan/Naxone
	Altered Mental Status	[eVitals_23]	N/A	GSC < 13
	Decreased Respiratory Rate	[eVitals_14]	N/A	RR <12

Table 1: Category of Keyword used in Free Text Search for CAD and ePCR.

Category:	**#**
Prescription Drug Names	100
Substance or Medication Use	17
Heroin and Overdose	4
Intravenous	3
Slang	2

(See spreadsheet “Keyword List for ISDS” for list of keywords, referencing Table 1.)

FirstWatch and Opioid Surveillance

FirstWatch, a longtime partner with public health in general, and specifically with the International Society for Disease Surveillance (ISDS), has focused for 20 years on emergency medical services (EMS) data surveillance for public health and other purposes. EMS data (call taking, dispatch, electronic patient care records) is rich in information, but notoriously non-standardized. FirstWatch monitors for overdoses (of all kinds) for over 200 communities, over half of which are specifically for opioid overdoses. These recommendations are presented to share our evolving experience in this area for the public good. These recommendations are provided as an informative starting point for anyone who wants to monitor their EMS data for opioid overdoses, and are provided as is, with no intended guarantee because every EMS system is different. However, we think and hope that you will find these recommendations helpful and will share your own suggestions here. We will be updating pertinent information on this page, including the Keyword List as we learn more, so we can all make improvements and share best practices for mining EMS data to identify opioid overdoses. If you have suggestions for this page, please contact Jenny Abercrombie, our Marketing Coordinator, at jabercrombie@firstwatch.net.

View this ISDS Webinar to see how the project got started and to learn more.
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