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Memorandum

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SUBJECT : Estimating Non-Fatal Carbon Monoxide Poisoning Injuries

This memorandum explains the historical procedure of estimating injuries associated with non-fire carbon monoxide (CO) poisonings, issues surrounding the procedure, and a brief consideration of ideas for future methods of estimating the number of CO poisoning injuries associated with consumer products.

Prior to the year 2001, the CPSC generated estimates of non-fatal carbon monoxide poisoning injuries reported in hospital emergency rooms as part of the annual report entitled "Annual Estimates of Non-Fire Consumer Product-Related Carbon Monoxide Deaths and Injuries." These estimates were based on data from CPSC's National Electronic Injury Surveillance System (NEISS). Industry's representatives expressed concern about the methodology used by CPSC staff to generate these estimates. After examining industry's criticism, the methodology was re-evaluated and CPSC staff decided to stop producing estimates of CO poisoning injuries as part of the annual report. The year 1999 was the last year an annual estimate was calculated for the number of people who reported to hospital emergency rooms for non-fire CO poisoning related to a consumer product. This memo will describe the methodology previously used to estimate CO injuries and also the criticism the methodology received.

CPSC staff has continued to discuss other options for obtaining data that can be used to generate annual estimates of non-fatal CO poisoning injuries associated with consumer products. One idea that has begun to be explored is to assign follow-up interviews for each NEISS case potentially associated with carbon monoxide and a consumer product to further examine the specifics of the emergency room visit. This memo will provide a brief introduction to this activity.

During meetings of the CPSC's Combustion Team and CO Strategic Planning Team, members of the teams have proposed alternative methods to generate an estimate of the number of non-fatal CO poisoning injuries associated with consumer products. Most of these proposals involve obtaining data from outside sources. Unfortunately, many of these proposals are prone to similar problems for which the historical methodology was criticized. In addition, some of the proposals would not allow for calculating a national estimate that could be monitored on a yearly basis. This memo will discuss alternative ideas that have been proposed by team members to generate the estimate and the challenges associated with these proposals.

Historical Methodology Used in Estimating Non-Fire Carbon Monoxide Poisoning Injuries

The estimated number of non-fatal CO poisonings reported in hospital emergency rooms was historically based on the National Electronic Injury Surveillance System (NEISS). NEISS is a probability sample of hospitals selected from the population of all hospitals with emergency rooms (ERs) in the U.S. and its territories. The hospitals in the sampling frame are stratified by size (number of emergency room visits) into four strata with a fifth stratum for children's hospitals. Cases in the NEISS sample are weighted to represent similar injuries in the U.S. and its territories. Using these weights, national estimates associated with carbon monoxide and a consumer product can be calculated. Data relating to each injury, including the consumer product(s) involved, location of injury, and a brief narrative, are collected in NEISS.

In order to locate CO poisoning cases within the NEISS database, the database was initially searched on the following criteria: treatment date within the year in question, diagnosis code equal to anoxia (65) or poisoning (68), non-work related injury, and the narrative contained reference to carbon monoxide, CO, or variations thereof. After the initial query of the NEISS database, cases were manually reviewed to exclude cases that were not associated with a non-fire CO exposure potentially related to a consumer product. The NEISS cases were attributed to CO largely based on the NEISS narrative. In a small number of cases, an in-depth telephone interview was conducted and completed. Any information obtained during this interview was also used to categorize the case.

NEISS case narratives are transcribed from medical charts of emergency room patients and contain any initial diagnosis by the ER attending physician. Any in-depth telephone interviews conducted from NEISS cases consist of telephone interviews with the ER patient (or his/her guardian) or less commonly, a firsthand witness of the incident. Historically, the majority of NEISS cases associated with CO did not have completed in-depths, so the analyst depended on the NEISS case narrative to determine whether a carbon monoxide (CO) poisoning occurred.

Criticism of Methodology Used in Estimating CO Injuries

In 2002, representatives of the gas industry criticized the process CPSC staff used for assessing and presenting CO-related injuries[1]. In response, the CPSC staff reassessed the manner in which CO injury estimates were calculated and decided to stop producing estimates.

[1] WEC Consulting, "Carbon Monoxide Injury Analysis: Preliminary Review of CPSC Non-fatal CO Injury Analysis", April 17, 2002.

Much of the criticism centered on the lack of detailed information contained about each case in the NEISS database.

To categorize whether the injury was a non-fatal CO poisoning depended mainly upon the short narrative field of the NEISS database. NEISS narratives associated with CO can vary greatly on the amount of detailed information contained. Examples of narratives associated with CO include:

- "Was working in enclosed room when got dizzy and passed out. Carbon monoxide poisoning ."[2]
- "Patient exposed to carbon monoxide in house, vomiting with headache."[3]
- "15 YOF sleeping in basement at home when CO detector went off - diagnosis CO poisoning. Fire Department attendance not stated."[4]
- "Carbon monoxide exposure - CO detector alarmed- Fire Department came - stated level was 200+ from the furnace."[5]
- "CO exposure, nausea and vomiting. Patient had a gas leak in house and patient was nauseated."[6]

Basing whether a CO poisoning occurred mainly upon the short NEISS narrative leads to a few issues. First, there is the question of whether there truly was a CO poisoning. A person may go to the emergency room for precautionary reasons because their CO alarm has gone off , the Fire Department detected CO in the home, or a CO exposure was suspected for some reason, but the individual may not be experiencing any effects of CO poisoning. In some cases, there may be some confusion as to whether the poisoning is associated with an exposure to natural gas or carbon monoxide. Since many of the symptoms of CO poisoning (e.g. fatigue, headache, nausea, dizziness, shortness of breath) mimic those of the flu or a cold there is the potential for misdiagnosing flu symptoms as a CO poisoning. It should be noted that the similarity of symptoms could also result in some cases of CO poisoning misdiagnosed as a cold or flu. Without further information about the case, such as carboxyhemoglobin (COHb) blood levels, ambient carbon monoxide levels in the house, confirmation of the source of the CO, reasons for visiting the ER (precautionary versus symptomatic), and further treatment obtained, it is difficult to determine whether a case can be classified as a carbon monoxide poisoning.

Secondly, there is the issue of what product is associated with the incident. The specific product involved may or may not have been coded by the hospital coders in the product field of the NEISS database. In some cases, the source of the CO was coded as unknown or as a CO alarm. Additionally, from the amount of information in the narrative, it is often not possible to ascertain the source of carbon monoxide or how the source was determined. Often the source of the CO can only be determined once an authority, such as the fire department, utility company representative, or an HVAC contractor has entered the home and investigated. This may be done

[2] NEK: 10826144
[3] NEK: 11104551
[4] NEK: 20204497
[5] NEK: 20145045
[6] NEK: 20324749

before or after the individual has visited the ER. Therefore at the time of the ER visit it may not be possible to accurately identify or confirm the source of the CO.

Finally, there has been some criticism over presenting NEISS CO estimates as "non-fatal CO poisoning injuries." NEISS cases can vary in their severity, from an individual receiving a precautionary examination due to their CO detector alarming to an individual receiving treatment in a hyperbaric oxygen chamber. There is likely a continuum of emergency room visits associated with a CO exposure that include those which are precautionary in nature, those that are symptomatic in nature, and those which require intensive medical treatment. With the historical method of calculating CO estimates it is not possible to divide CO emergency room visits depending upon severity due to the lack of information available within the NEISS database.

Alternative Ideas Considered for Obtaining CO Injury Estimates

CPSC staff continues to consider methods for estimating the number of non-fatal CO poisonings associated with consumer products. There are two pieces of information that are needed in order to develop the estimate. First there needs to be a method to confirm that a CO poisoning has taken place and second there needs to be a confirmation of the source of the CO. Due to the sparse amount of information provided in the NEISS database, one proposal has been to further explore NEISS cases with a follow-up phone interview in an attempt to obtain more detailed information that could potentially confirm the CO poisoning and the source of the CO. This has been done and data are being compiled. A brief description of this project is explained in the next section of this memo.

Another proposal is to use the NEISS system to conduct a special study. It has been proposed that as part of a special study, hospitals would perform a carboxyhemoglobin (COHb) blood test on cases that meet certain criteria. Since symptoms of carbon monoxide poisoning are very similar to a cold or flu, if the study group is defined by its symptoms the eligible study population would become quite large. If the group is limited to those who mention carbon monoxide in their initial complaint, then the selection of the test group becomes very subjective. Logistically, there are many difficulties inherent in the special study proposal. All NEISS hospitals cannot be mandated to participate in the special study. Participation would need to be on a voluntary basis therefore national estimates may not be able to be calculated. Any hospital that would volunteer to participate would need to obtain permission from a hospital review board since the study would involve the sampling of blood from human subjects. Not only would this present a difficulty in convincing hospitals to participate in this time consuming process but the cost of this process could also be substantial. Another sizeable cost associated with this type of special study would be the cost of the COHb blood tests. Since COHb tests are very time dependent, as the concentration of CO in the blood can decrease if a person is given oxygen or has been removed from the source, basing the definition of a CO poisoning on a COHb blood test alone may result in an underestimation of poisonings. Therefore additional information would also be needed on each case. Additionally, information on the source of the CO would be prone to the same problems as the NEISS system; as the source of the CO would be reported by the consumer at the time of the ER visit.

Other ideas that have been considered focus on obtaining and using information sources other than NEISS. Unfortunately many of these sources are susceptible to some of the same difficulties as NEISS in defining and confirming a CO poisoning and the source of the CO. Different sources that have been proposed are laboratories that perform carboxyhemoglobin (COHb) testing, Medicare and Medicaid records, insurance records, military personnel records, and surveillance of hyperbaric oxygen facilities. All of these alternative sources have two problems in common. At this time, there is no public access surveillance system in place that would allow us to compile this type of data. Data obtained from these sources would be a sample of convenience and not a probability sample; therefore the data would be representative of a specific subgroup of the population and national estimates could not be calculated using the data collected. In addition to these two major obstacles, each of these sources presents some additional challenges.

Surveillance of laboratories presents a problem with only providing the COHb level and it is not clear how the source of the CO could be determined. It may be difficult to obtain personal identifiers from a laboratory. Only with personal identifier information could there potentially be some sort of follow-up that could determine the source of the carbon monoxide. Also since COHb tests are time dependent, as the concentration of CO in the blood can decrease rapidly if a person is given oxygen or has been removed from the source, basing the definition of a CO poisoning on a COHb test alone may result in an underestimation of poisonings.

Obtaining information from insurance, Medicare, Medicaid, or military personnel records is prone to the same challenges as the NEISS system in confirming a CO poisoning and the CO source. To begin, the method used to define a case as a CO poisoning is subject to the same problems as the NEISS system (i.e. precautionary visit versus poisoning, misdiagnosis, natural gas versus CO exposure). Depending on the type of information available from these records, it may or may not be possible to confirm whether a CO poisoning occurred. Information on the source of the CO associated with the exposure may or may not be available from these records. Since these records are not set up as a surveillance system for consumer products, it may be difficult to obtain information on the source of the CO. If information about the source of the CO is found on the record, it would be prone to the same problems as information about the source of the CO found in the NEISS system.

Surveillance of hyperbaric oxygen (HBO) facilities offers an option to monitor cases of CO poisoning that undergo treatment at an HBO facility. In 1992, there were 208 HBO facilities in North America that managed a total of 2,636 patients[7]. Surveillance of these facilities may offer information on the CO cases that receive HBO treatment at one of the facilities but would provide information only on a subgroup of the population. Only certain regions and hospitals have access to an HBO facility. Variability exists among facilities as to what selection criteria are employed for the use of HBO in acute CO poisoning cases; therefore not all patients treated in an HBO facility meet the same eligibility criteria. For cases with serious initial symptoms, HBO facilities are in agreement on routinely prescribing HBO treatment (i.e. 98% of the HBO facilities would routinely use HBO treatment for an adult patient who arrived at an ER unconscious with COHb 9.5%). In cases with less severe symptoms HBO facilities do not

[7] Hampson N, Dunford R, Kramer C, Norkool D. Selection Criteria Utilized for Hyperbaric Oxygen Treatment of Carbon Monoxide Poisoning. The Journal of Emergency Medicine. 1995; 13:227-231.

routinely agree on when treatment should be prescribed (i.e. 48% of the HBO facilities would routinely use HBO treatment for an adult patient with a history of CO exposure, no loss of consciousness, COHb 9.5% with headache and dizziness only) [7]. Therefore this sample population would not be homogenous in the severity of the poisoning or their clinical definition. The sole defining characteristic would be that they received treatment in one of the HBO facilities. Therefore monitoring the yearly trends of this population may be difficult as any trend may be influenced by confounding issues such as the number of hospitals having access to the facility and the criteria implemented in prescribing the treatment. Finally there remains the issue of confirming the source of the CO, which is prone to the same challenges as the previously discussed proposals.

Another proposal is to use data collected by other agencies. Three examples of potential data sources compiled by other agencies are the three national surveys conducted by the Centers for Disease Control and Prevention (CDC). These three surveys include the National Hospital Ambulatory Medical Care Survey (NHAMCS)[8], the National Ambulatory Medical Care Survey (NAMCS)[9], and the National Health Interview Survey (NHIS)[10]. In brief, NHAMCS is a national probability sample that gathers information about the ambulatory health care provided by hospital emergency rooms and outpatient departments. NAMCS is a similar survey that collects information on the ambulatory care visits provided by office-based physicians. NHIS is a multistage probability sample that collects data during face-to-face interviews of members of selected households. A cursory review of these surveys was conducted in order to determine whether any of these surveys could provide the type of information required to estimate the number of non-fatal CO poisonings associated with consumer products. To begin, the general summaries published by the CDC for each survey were examined. The NHAMCS report provides a single estimate for all poisonings (including poisonings by drugs, medical substances, biological, other solid and liquid substances, gases, and vapors). The NAMCS report groups all injuries and poisonings together into one category. The NHIS report groups all medically attended poisonings together. Therefore the type of information CPSC staff would use to estimate the number of non-fatal CO poisonings associated with a consumer product is not found within the general summaries published for these three national surveys. After briefly reviewing the questionnaires utilized in these surveys it appears that data obtained from these surveys face similar challenges as the NEISS system. The NHIS survey generates poisoning estimates based on an individual's self-report of a medically attended injury or poisoning episode in the past 12 months. Therefore this data would present the same problem as the NEISS data in confirming the poisoning. Both NHAMCS and NAMCS use a questionnaire that allows for a narrative of the patient's initial complaint and the physician's final diagnosis. These are then coded into ICD-9 Clinical Modification codes. Therefore confirming a CO poisoning using this data is prone to many of the same problems as the NEISS system. None of these surveys are aimed at collecting information on the source of the CO and this type of information would again be collected from a short narrative that might contain CO source information. In conclusion, after a

[8] McCaig L, Ly N. National Hospital Ambulatory Medical Care Survey: 2000 Emergency Department Summary. Advance Data from Vital and Health Statistics. 2002; Number 326.
[9] Cherry D, Woodwell D. National Ambulatory Medical Care Survey: 2000 Summary. Advance Data from Vital and Health Statistics. 2002; Number 328.
[10] National Center for Health Statistics. Summary Health Statistics for the US Population: National Health Interview Survey, 1998. Vital and Health Statistics. 2002; Series 10, Number 207.

cursory review of these surveys, it does not appear that information obtained from these surveys would offer any advantages to data obtained from the NEISS database.

There has also been some discussion of the new CDC Environmental Public Health Tracking Program[11]. The goal of this tracking program is to allow direct electronic data reporting and linkage of health effect, exposure, and hazard data. Although there may be potential for the CPSC staff to find useful data within this tracking system, at this time the tracking system is still in its very early stages of development and has only begun identifying and evaluating existing data systems and developing model systems that link environmental and human health data. Therefore the usefulness of the data obtained from this network will need to be evaluated at a later date.

The discussion of alternative proposals to monitor non-fatal CO poisoning injuries has not yielded an alternative data source that is logistically feasible, provides a national estimate, and overcomes the criticisms of the historical method of estimation. Staff will continue to consider alternative data sources but at this time no alternative has been proposed that allows for national estimates to be calculated and overcomes the shortcomings of the estimates generated using the NEISS database.

NEISS Follow-up Interview Project

NEISS cases that were associated with carbon monoxide (CO) were assigned from May 1, 2001 to April 30, 2002. In order to locate CO poisoning cases within the NEISS database, the database was initially searched on the following criteria: the treatment date between 5/01/2001 to 4/30/2002, the diagnosis code equal to anoxia (65) or poisonings (68), a non-work related injury, and a product code equal to carbon monoxide poisoning when source is unknown or carbon monoxide detector or the narrative contained reference to carbon monoxide, CO, or variations thereof. Cases were then manually reviewed to select cases to be assigned an in-depth telephone interview. Cases were not assigned an in-depth telephone interview if from review of the NEISS narrative the case was: not potentially associated with a CO exposure (i.e. was some other type of poisoning or asphyxiation), fire related, intentional in nature, related to a source not under the jurisdiction of the CPSC (i.e. auto or boat related), or ruled out as a CO exposure. If an incident involved multiple individuals, only one in-depth interview was assigned and the interviewer attempted to obtain some information about all individuals. The questionnaire used during the interview can be found in Appendix A.

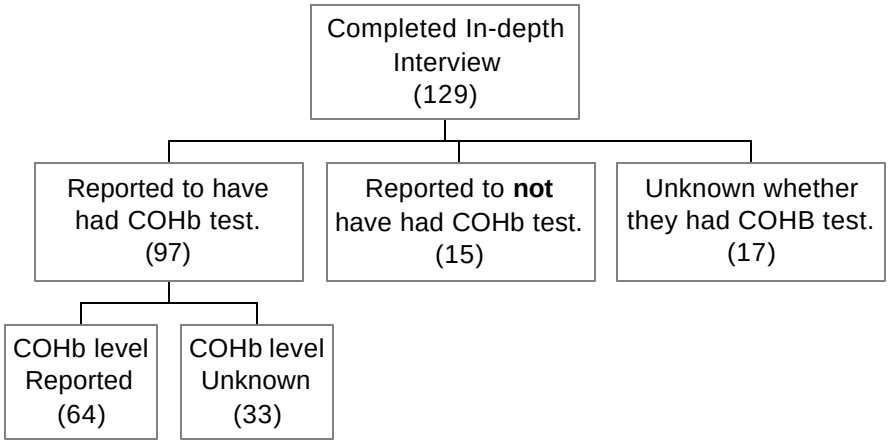
Two hundred and seventy-four individual cases met the criteria for assignment. At this time, in-depth interviews have been completed for 129 individuals (this includes those interviews that were conducted where one individual in a multiple case incident was interviewed; the number of unique incidents is 68). Reasons that interviews were not completed include: contact information for an individual was not provided by the NEISS hospital (47 individuals), an individual refused to participate in the interview (27 individuals), or attempts to contact an individual were unsuccessful including interviews that were mailed and at this time were not returned (71 individuals). Variables that will be examined to confirm a CO poisoning include

[11] CDC Press Release. CDC Awards Fund for Environmental Public Health Tracking. Oct. 8, 2002. www.cdc.gov/od/oc/media/pressrel/r021008b.htm

ambient in-house CO levels, symptoms experienced, and COHb levels. Information will also be obtained about the source of the CO that was associated with the incident.

Ninety-seven of the 129 (75%) individuals reported that they had a COHb test at the hospital and 64 of the 97 (66%) individuals reported a value for their COHb test. Figure 1 provides a flow chart of COHb blood test reporting. For 17 individuals it was not known if a COHb test was performed. Therefore there were 50 individuals (39%) who either had a test and did not know the COHb blood level (33) or did not know if they had a COHb blood test (17). Due to the large percentage of individuals who did not provide complete information on their COHb levels, staff members are in the process of attempting to obtain COHb information from NEISS hospital records. Eighty-seven individuals reported that the ambient level of CO was measured in their house and 50 individuals reported the level. In-depth interviews will be examined more closely to determine if sufficient information is available to develop a method of defining a CO poisoning and if so, how many of the cases meet this definition. A full description of the in-depth interviews will be provided in a future memorandum. A potential limitation of this study may be the small sample size of those who completed the interview, therefore the analysis of this study will be limited in the number of stratified analyses that can be performed with an acceptable degree of accuracy.

Figure 1:
COHb Blood Test Reporting



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McCaig L, Ly N. National Hospital Ambulatory Medical Care Survey: 2000 Emergency Department Summary. Advance Data from Vital and Health Statistics. 2002; Number 326.

National Center for Health Statistics. Summary Health Statistics for the US Population: National Health Interview Survey, 1998. Vital and Health Statistics. 2002; Series 10, Number 207.

WEC Consulting. Carbon Monoxide Injury Analysis: Preliminary Review of CPSC Non-fatal CO Injury Analysis. April 17, 2002.

Appendix A

Questionnaire for Carbon Monoxide Incidents

Task Number_____ Interviewer_____

Record of Calls

Date	Day of Week	Time	Result

*=Completed CB=Call Back LB=Line BusyWN=Wrong Number
NWN=Nonworking Number NA=No Answer R=Refused
NER=No Eligible Respondent

Suggested call back time: Day:_____ Time:_____ am/pm

Review NEISS information.

Interviewer introduction:

The respondent should be the victim if at all possible.
If the victim is age 17 or younger, obtain parental permission to interview the victim.

If permission is not given to speak to the child, ask the parent/guardian if he/she would be willing to listen to the interview (on an extension phone, if available) while you interview the victim.

If not, interview the parent or guardian of the victim.

If respondent was victim, use "You" where appropriate in the questions; otherwise use victim's name or say "the victim" or "the patient."

In general, in the questionnaire, the bolded text contains interviewer instructions and should not be read to the respondent!

Hello. May I speak with_____? **(Ask for victim by name or parent or guardian of victim under age 18.)**

(If the above person is available, continue with introduction below.) Otherwise, ask: When would be a good time to contact him/her? **(Record above and when desired person is contacted, continue with introduction.)**

Hello, I'm _____ from _____. We are working with the U.S. Consumer Product Safety Commission and some hospitals to find out about incidents involving **carbon monoxide (CO) exposure**. We would like to ask you a few questions about your/the victim's accident. This should take only a few minutes. Your answers will be kept completely confidential. The information is only for statistical totals and no names will be used. Will you help us?

INTERVIEWER: Please circle the number of the correct response:

Respondent:
1 agreed
2 refused
3 other (specify:)_____

1. I understand you/victim were treated at _____ Hospital on _____ (date) for an incident that involved **carbon monoxide**. Is that correct?
   1. yes
   2. no --> **Only if incident did NOT involve carbon monoxide, STOP after obtaining correct injury scenario information.**
      _____
      _____
      _____
      _____
   3. don't know --> **Ask if anyone else in the household knows more about the incident and can respond. If necessary, set up a time to call back.**
      (Record on page 1.)

INTERVIEWER: Please circle the number of the correct response:

Respondent is:
1. injured person --> skip to question 2
2. parent of an injured child under 18
3. other --> Specify: _____

1.A. Were you present during the incident?
   1. yes
   2. no

2. Please describe how the carbon monoxide incident happened. That is, what (were you/was the victim) doing just before, during and just after the incident occurred. Describe what fuel-burning product or products generated the carbon monoxide. Did you/the victim receive treatment? If so, please describe the treatment. How many others besides you/the victim went to the ER and what treatment, if any, did they receive?

Interviewer Check List: **____ Describe scenario** **____ Describe product**

____ Describe treatment **____ Describe other victims**

Interviewer: The following questions may have been answered in the narrative above. If so, ask again, telling respondent you are just verifying the answer. You could say: "Let's see, you told me before that..., is that correct?"

Interviewer: Inform the respondent that "CO" will be used to mean carbon monoxide in the following questions.

3. Where were you/was the victim at the time of the incident? **If the respondent answers "home", you may have to prompt him/her by reading down the list.**

   ____ Detached house, townhouse, or duplex

   ____ Apartment

   ____ Mobile home

   ____ Manufactured home

   ____ Recreational Vehicle, camper, or trailer

   ____ Tent, cabin

   ____ Other, specify_____

   ____ Don't know

4. Was a CO detector present where the incident occurred?

   ____ Yes

   ____ No **(Skip to Question 6)**

   ____ Don't know **(Skip to Question 6)**

5. Did the CO detector alarm or sound during the incident?

   ____ Yes

   ____ No

   ____ Don't know

6. Were you/the victim aware of any of the following symptoms during the incident? **Check all that apply**

___ Headache
___ Fatigue/tiredness
___ Dizziness
___ Confusion
___ Nausea
___ Shortness of breath
___ Chest pains
___ Other, specify_____
___ None
___ Don't know

7. What fuel-burning product or products generated the CO in the incident?

Check all that apply. After each product, ask for the type of fuel.
If the respondent answers "gas", ask whether natural gas or LP gas/ propane/butane. If respondent doesn't know the type of gas, write "Unknown Gas".

___ Don't Know
___ None
___ **Motor vehicle** (Skip to Question 12)

___ Furnace (central heating)	Fuel_____
___ Boiler (central heating)	Fuel_____
___ Wall/floor furnace or space heater	Fuel_____
___ Fireplace	Fuel_____
___ Water heater	Fuel_____
___ Range or oven	Fuel_____
___ Grill	Fuel_____
___ Other, specify_____	Fuel_____

8. To your knowledge, were other factors involved in causing the CO incident, for example backdrafting, a blocked vent, product malfunction, etc.?
____ Yes
____ No **(Skip to Question 9.)**
____ Don't Know **(Skip to Question 9.)**

8.A. Please describe other factors involved.

_____

_____

_____

_____

9. Did someone measure the CO level in the place where the incident occurred?

___ Yes

___ No **(Skip to Question 10.)**

___ Don't Know **(Skip to Question 10.)**

9A. Who measured the CO level, and what level did they find? **Fill-in all that apply.**

___ Fire Department CO level _____ppm ____Don't Know

___ Utility Company CO level _____ppm ____Don't Know

___ Other, specify_____ CO level _____ppm ____Don't Know

___ Don't Know who measured

10. Was the carbon monoxide level in your/the victim's blood measured during the ER visit?

____ Yes

____ No (Skip to Question 11.)

____ Don't Know **(Skip to Question 11.)**

10A. What was the level?

_____ %

____ There was no CO found in blood

____ Don't Know

11. Please provide the age, sex and CO blood level of each *additional* victim who went to the ER, if any:

_____ No Additional Victims

Additional Victims	**Age (yrs./mos.)**	**Sex (M/F)**	**CO blood level (%)**	**Don't Know CO Blood Level**	**No Blood Test**
Addt'l Victim 1					
Addt'l Victim 2					
Addt'l Victim 3					
Addt'l Victim 4					
Addt'l Victim 5					
Addt'l Victim 6					
Addt'l Victim 7					
Addt'l Victim 8					
Addt'l Victim 9					
Addt'l Victim 10					

12. If we have any further questions, may we call you back?

___ Yes What is the best day and time to reach you? _____

___ No

Thank you very much for your time and for your help.