Trained nurses in poison information: An approach to increase effectiveness in poison information
Binscheck T*, Borchart-Avalone J, Engel A, Schyska R
Poison Information Centre Berlin at Charité University Medicine, Berlin
*Labor Berlin, Laboratory Medicine & Toxicology, Berlin

Introduction
Objective. Poison information centres are challenged with an increasing number of inquiries combined with high economical pressure. As the increase in inbound calls is predominantly due to a rising number of nonprofessional persons seeking medical advice with assumed toxic exposures (Fig. 1), we have established and tested a model in which trained nurses preferentially answer those low-level inquiries in the first line.

The design of this study was encompassing the following conditions:
1. A physician in charge is always present and can take over the call immediately.
2. The nurses answer all calls in first priority and decide if advice by a physician is necessary (escalation principle). A scope of substances and an algorithm to decide when nurses should escalate the call to a physician, have been developed.

After two years of training we have analyzed a retrospective three months trial period to answer the following questions:
3. Is it possible to shift a part of the inbound calls workload from physicians to trained nurses maintaining a high level of quality?
4. Does a call by a nonprofessional person predict that it is mostly low-level and how to find out the serious interations among them?
5. Can the scope of inquiries and the algorithm allow to seamlessly integrate the nurses activity into the routine workflow?
6. Does the strategy significantly free physicians time to do more specialized things?

Results (continued)

A first three month time interval was examined for the following parameters: a total number of 10,986 of inbound calls were counted with 3,463 (31.5%) received by nurses. From these, 2,045 calls were initiated by non-professionals and 1,301 by health care professionals (i.e., 37.6%). In 39 cases of the 2,045 call was handed over to a physician because of the unexpected complexity or other medical problems. In contrast 703 calls from health care professionals had to be managed by a physician. To analyse the throughput of cases their duration was measured yielding a median of 2.41 [min.; mean]. In comparison, toxicological advice by physicians had a median duration of 3.03 [min.; mean]. 1,468 from 2,045 (71.3%) calls by non-professionals did not need any therapeutic advice; in 280 cases simple treatment (e.g., decontaminating agent) was requested. In 240 cases admission to a hospital was advised.

A trial period of three months with 15,090 calls in total has been analyzed for the parameters listed below. Two Nurses worked from 8.00 to 20.00 in a regular schedule from Monday to Friday. During that time a physician was present but not answering calls in first priority except when the nurses decided to involve them.

Fig. 2 Flowchart for the escalation of calls
This procedure allows the comprehensible decision for the nurse, when to handover the call to a physician. It is based on four simple questions which trigger the escalation of the case when necessary.

Fig. 3 Origin of inbound calls
With an almost identical number of contacts at 2,500 during the three month trial, the nurses had a significant higher portion of non-professional callers. Non-professionals consisted of ordinary people, employees at homes for seniors, handicapped people, pharmacists, health care professionals were physicians, paramedics and nurses. Although the nurses only worked between 8.00 and 20.00 they processed more than 50% of all calls during the three months.

Introducing trained nurses into the daily routine on the phone at poison information can significantly reduce the physicians’ workload and increase accessibility of the institution. A mandatory scope of substances, nurses can manage by themselves, has to be coupled to a decision flowchart which triggers the escalation of any case to a physician standing by. Using this approach the following points could be demonstrated:

The activity of the nurses can be focussed on low-level inquiries which are predominantly received from non-professional inbound calls.
Exposed persons rarely have any symptoms or need medical treatment.
It is of greatest importance that nurses have stay alert that at any time a case may occur with alarming symptoms or conditions which requires immediate handover to the physician.
The quality and safety of the given advice can be maintained by a supervision performed by a physician.
To fully integrate this procedure it is of greatest importance that both roles are clearly defined and accepted by the team of advisors. As the experience of nurses will increase by time it is recommended to adjust the scope of substances from time to time.

Conclusion

Fig. 4 Age distribution of patients
Nurses are significantly more often confronted with inquiries about babies and infants than physicians. These are more often involved in cases of adults and seniors due to the fact that those inquiries are more often high-level and therefore must not be advised by a nurse.

Fig. 5 Estimated severity of intoxication at first contact
In more than 75% of all inquiries handled by the nurses no symptoms were present. Compared to the physicians they managed a significantly smaller portion of poisonings with medium and severe symptoms, which were routinely hand over to the physician.

Tab. 1 Most prominent agents
There is a significant difference in the frequency of medications as cause of intoxications between nurses and physicians. This is probably due to the fact, that nurses only work at daytime. For the same reason they are confronted more like with exposures towards plants as there are more common in infants than in adults.