



The Q-Net™ Monthly

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APIC '99

Presented are the data of *The Q-Net™ Monthly's* first national survey. In next month's issue, the significance of these data will be discussed in detail.

In the April 1999 issues of the *American Journal of Infection Control* and *Infection Control and Hospital Epidemiology*, outbreaks or (pseudo-outbreaks) following bronchoscopy were reported. It appears that bacteria in the rinse water may be at fault. See you at APIC '99!

Q-Net '98



'Q-Net-98' is now available. This book contains all of the past year's newsletters in a bound booklet. Order your copy today. \$9.95 includes S&H.

What is 'Q-Net'?

Q-Net is a technology-assessment network of questions and answers. Its newsletter is *The Q-Net™ Monthly*.

Q-Net's main goal is to encourage the infection control and endoscopy communities not only to ask good questions but also to demand succinct and well referenced responses.

Q-Net addresses the needs of both the health care provider whose goal is to provide the best care possible, and the patient who deserves affordable quality health care.

Current Reprocessing Practices: A National Survey

PART 1: THE DATA

Last year a questionnaire was mailed to the subscribers of this newsletter. This questionnaire, which was published in this newsletter's May-June 1998 double issue, was designed to provide insight into current flexible endoscope reprocessing practices. Other practices, such as rigid endoscope and biopsy forceps reprocessing, outsourcing and the reuse of single-use instruments, were also investigated. The data are presented below. Next month's newsletter will present: Part 2: Discussion of Results.

In early June 1998 a two-page survey questionnaire was mailed to all subscribers of this newsletter. The survey was divided into 4 sections: (1) *General Questions*, (2) *Flexible Endoscope Reprocessing*, (3) *Rigid Endoscope Reprocessing*, and (4) *Outsourcing/Reuse of Single-Use Devices*.

The survey, which asked 25 multi-item questions, many of which provided multiple-choice answers, was mailed to approximately 2900 health care professionals. Completed surveys from 146 respondents were returned, most within 4 weeks (94%, n=137).

The data from only one survey were accepted when an institution returned two or more surveys. The majority of the

surveys were returned anonymously (69%, n=101).

For several of the survey's questions, respondents provided multiple responses, often causing number of responses to exceed the number of respondents. Whenever a respondent did not provide a complete or clear response, the response was not recorded.

General Questions: Most respondents were registered nurses (RN) (n=126, 86%), and almost all worked in health care facilities located in the United States (US) (n=136, 93%). Approximately half (n=76) resided in the *North-East* (n=38) and *Mid-West* regions (n=38) of the US (Table 1, next page).

Almost three-quarters of the respondents worked in non-profit, public health care facilities (n=105, 72%). Two-thirds (n=98, 67%) worked in an "urban/city" environment. Between 200 and 300 (n=25, 17%) beds was the most frequent response, and "2" (n=42, 29%) was the most frequent response for the number of dedicated endoscopic procedure rooms ("EPR/GI"). (The mean number of beds and EPRs was 260 and 3.1, respectively.)

More than three quarters of the respondents (n=114, 78%) reported that infection control measures in endoscopy have increased over the past few years. Few respondents (n=7, 5%) reported altering their routine reprocessing procedure for endoscopes used on

TABLE 1: NUMBER, PERCENTAGE OF RESPONDENTS WORKING IN THE INDICATED REGION OR COUNTRY.

North-East (USA) (eg. ME, CT, PA, DE)	Mid-West (USA) (eg. IA, OH, MO, IN)	South-East (USA) (eg. NC, GA, AR)	North-West (USA) (eg. ID, WA, n. CA)	South-West (USA) (eg. HI, TX, s. CA)	Mid-Atlantic (USA) (eg. VA, Wash DC)	Canada	Cuba
38	38	18	17	17	8	9	1
26%	26%	12%	12%	12%	5%	6%	<1%

patients known to be (or suspected of being) infected with a bloodborne pathogen, such as HIV or HBV.

Flexible Endoscope Reprocessing: Respondents reported using 4 types of biocidal agents to reprocess flexible endoscopes in several different facility sites (Table 2). Due to multiple answers, 160 responses were provided by the 146 respondents. One hundred and seventeen (80%) respondents used glutaraldehyde (all types of formulations). (Because 4 of these respondents used glutaraldehyde in two different sites, 121 responses are listed in Table 2.) While ethylene oxide gas (EtO) (n=1) and Sporox (n=4) were infrequently used, 33 (23%) respondents used the *Steris System 1™* ("SS1"). (Because 1 respondent used the *SSI* in two different sites, 34 responses are listed in Table 2.)

In general, respondents reprocessed flexible endoscopes at the *point-of-use*: that is, *in* or *near* the endoscopic procedure room ("EPR/GI") (Table 2). Only a few respondents reprocessed flexible endoscopes in the central supply department ("CS"). (See Table 5 for a comparison of these data to *rigid* endoscope reprocessing.)

Nine brands of different glutaraldehyde formulations were used to reprocess flexible endoscopes. Ninety-two (79%) of these 117 respondents used 2% (14-day, alkaline, non-surfactant) glutaraldehyde, with *Cidex™* being the most frequent response (52%, n=48), followed by *Metricide™* (15%, n=14). (Fourteen (15%) of these 92 respondents did not provide the solution's brand name.) Twenty (17%) respondents used a 28-day glutaraldehyde (ie, >2%, alkaline, surfactant) formulation, with *Cidex Plus™* being the most frequent response (n=14, 70%). Five (4%) respondents used *Wavicide™*, an acidic 2% glutaraldehyde formulation.

2% (alkaline, 14-day) glutaraldehyde: Of the 92 respondents using 2% (14-day, alkaline) glutaraldehyde, more than half (58%; n=53) immersed endoscopes for 20 minutes to achieve high-level disinfection (Figure 1); 9 (10%) immersed endoscopes for 45 minutes; 3 (3%) for between 25 and 30 minutes; 2 (2%) for less than 20 minutes; and 25 (27%) did not provide an immersion time.

More than one-third (36%, n=33) of the 92 respondents reported an immersion temperature of 20°C (ie, 'room temperature') (Figure 1). Three (3%), 4 (4%), and 8 (9%) respondents used an elevated immersion temperature between 20° and 25° C, 25° C, and above 25° C, respectively. Almost half (48%, n=44) did not provide an immersion temperature. Immersing endoscopes for 20 minutes at room temperature was the most frequent response (n=28, 30%). Three (3%) respondents used 2% glutaraldehyde for 45 minutes at 25°C.

28-Day glutaraldehyde: Twelve (60%) of the 20 respondents using 28-day (>2%, alkaline, surfactant) glutaraldehyde immersed endoscopes for 20 minutes. One respondent used an immersion time of 10 minutes, one used an immersion time above 20 minutes, and 6 (30%) did not provide an immersion time. Four (20%) of these 20 respondents used an immersion temperature of 'room temperature' (ie, 20°C), and 2 (10%) used a temperature of 25° C or above. Fourteen (70%) respondents did not provide an immersion temperature.

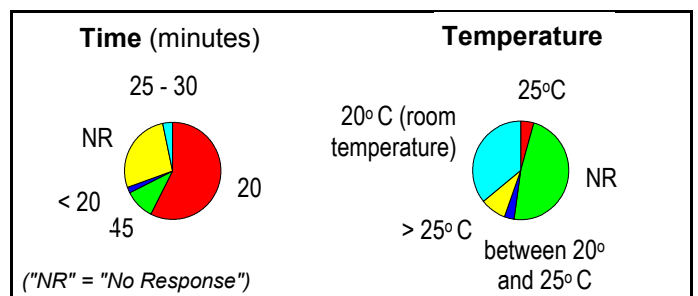
(Continued on page 9)

TABLE 2: NUMBER OF RESPONSES INDICATING A SPECIFIC BIOCIDAL AGENT TO REPROCESS FLEXIBLE ENDOSCOPES; AND THE SITES IN THE FACILITY WHERE THESE AGENTS WERE USED.

Biocidal agent, Site	In CS	In EPR/GI	Near EPR/GI	No Response
Glutaraldehyde (all types)	8	8	103	2
Steris	2	3	29	0
Sporox	0	0	4	0
EtO	0	0	1	0

Note: 'CS' refers to the 'central supply department,' and 'EPR/GI' refers to 'endoscopic procedure room'.

FIGURE 1: IMMERSION TIMES AND TEMPERATURES REPORTED FOR 2% (ALKALINE) GLUTARALDEHYDE.



Sporox,™ *Wavicide*™: Three (75%) of the 4 respondents using *Sporox* immersed flexible endoscopes for 20 minutes. Two (50%) used an immersion temperature of between 27° C and 30° C. Of the 5 respondents using *Wavicide*™ (2%, acidic), 3 (60%) reported using a soaking time of 20 minutes, and 4 (80%) an immersion temperature of 20° C.

AFERs: One hundred (68%) of the 146 respondents used an AFER (no manual reprocessing); 37 (25%) respondents manually reprocessed (ie, cleaned and disinfected) flexible endoscopes (no AFER); and 8 (5%) reprocessed endoscopes both manually and with an AFER. One respondent did not provide a response. Several different brands of AFERs were reported (Table 3). (Because 4 respondents used two brands of AFERs, 112 responses are listed in Table 3, causing the total to exceed 100%.)

Eighty-eight (81%) of the 108 respondents using an AFER (either exclusively or in addition to manual reprocessing) filtered the tap water using a bacterial (0.1 or 0.2 micron) filter membrane. Of the 45 respondents (25%) that reprocessed flexible endoscopes manually (8 of whom also used an AFER), 23 (51%) used unfiltered tap water to

TABLE 3: BRAND AND NUMBER, PERCENTAGE OF RESPONDENTS USING AN AUTOMATED FLEXIBLE ENDOSCOPE REPROCESSOR (AFER).

Custom Ultrasonics	Steris System 1	Olympus/Medivator	Chris Lutz	Unitrol/ (ASP)	No Response	Ott Disinfectant
46	34	14	6	5	5	2
43%	31%	13%	6%	5%	5%	2%

rinse the endoscope. Eleven (30%) and 4 (11%) of the 37 respondents who only reprocessed endoscopes manually used bottled, sterile water and distilled water, respectively, as a final water rinse.

Water quality: Eight (5%) of the 146 respondents reported isolating *Pseudomonas aeruginosa*, *Mycobacterium chelonae*, *M. avium*, and other atypical mycobacteria from their facility's tap water supply.

Alcohol rinse, forced-air: One hundred and twenty (82%) of the 146 respondents *both*: (a) terminally rinsed the endoscope's channels with 70% alcohol (to facilitate drying), and (b) dried each channel using forced air. Seventy-three (61%) of these 120 respondents performed these two steps prior to endoscope storage as well as after each reprocessing cycle (ie., several times a day), while 39 (33%) performed both steps only prior to endoscope storage. (Eight of these 120 respondents did not provide a response.) Ten of the respondents either performed only one of these two steps or

TABLE 4: REPORTED INFECTIONS FOLLOWING A FLEXIBLE ENDOSCOPIC PROCEDURE.

Respondent	Procedure	Infection Type	Microorganism
1	bronchoscopy	Legionella pneumonia	<i>Legionella pneumophila</i>
2	ERCP	cholangitis	<i>Pseudomonas species</i>
3	ERCP	Unknown	No response
4	ERCP	pancreatitis	Unknown
5	ERCP	bacteremia	<i>Pseudomonas Maltophilia</i>
6	bronchoscopy	No response	<i>Pseudomonas species</i>
7	ERCP	bacteremia	No response

did not provide a response, and 16 (11%) performed neither step. Eleven (69%) of these 16 used *SSI*, 2 (13%) tap water, and 3 (19%) bottled, sterile water for the final rinse.

Reported infections: Seven (5%) respondents reported patient infection following flexible endoscopy (Table 4).

Biopsy forceps: Over half (n=81, 55%) of the 146 respondents used pressurized steam to sterilize biopsy forceps; 33 (23%) used either glutaraldehyde (n=23) or *SSI* (n=10); 14 (10%) respondents used EtO; and 3 (2%) used the *Sterrad*™. Twenty respondents (14%) used disposables biopsy forceps. (Some respondents provided multiple responses.)



Rigid endoscope reprocessing: Eighty-nine respondents (61%) used rigid endoscopes. Four (4%) of these respondents used disposable rigid endoscopes that (presumably) were discarded after one use. Several different types of biocidal agents were used to reprocess reusable rigid endoscopes. (Due to multiple answers, 85 respondents provided 98 responses.) Nineteen (21%) respondents used pressurized steam; 11 (12%) used EtO; 28 (31%) used *SSI*; 26 (29%) used glutaraldehyde (all types of formulations); 9 (10%) used the *Sterrad*™; 2 (2%) did not provide a response; and 3 used either *Abtox*™ (n=1, 1%), *Sporox*™ (n=1, 1%), or *PlasPlus*™ (n=1, 1%).

Rigid endoscopes were reprocessed in several different sites within the facility (Table 5). (Due to multiple answers, 104 responses are listed in Table 5.) Unlike flexible endoscopes (Table 2), reprocessing rigid endoscopes in a central department was a more frequent response than *in* or *near* the procedure room, ie., operating room ("OR"). Twelve respondents reprocessed rigid endoscopes in the 'GI' suite. Also, although the use of the *SSI* for reprocessing flexible endoscopes was much less frequent a response than

TABLE 5: NUMBER OF RESPONSES INDICATING A SPECIFIC BIOCIDAL AGENT TO REPROCESS RIGID ENDOSCOPES; AND THE SITES IN THE FACILITY WHERE THESE AGENTS WERE USED.

Biocidal agent, Site	In CS	In OR	Near OR	In GI	No Response	Other
Pressurized steam	17	0	2	0	1	0
EtO	11	0	0	0	0	0
Steris System 1™	4	13	9	4	0	0
Glutaraldehyde (All types)	7	3	7	8	3	1
Sterrad™	8	1	0	0	0	0
Other or No response	3	2	0	0	0	0

glutaraldehyde (Table 2), the *SSI* was as frequent a response as glutaraldehyde for reprocessing rigid endoscopes.

Of the 26 respondents using glutaraldehyde (all formulations) for reprocessing rigid endoscopes, more (n=14; 54%) used a 2% (alkaline) glutaraldehyde solution than any other formulation, with *Cidex*™ (n=11) being the most frequent response. (Ten of the respondents did not provide a brand name.) Thirteen (50%) of these respondents immersed rigid endoscopes for 20 minutes; 11 did not specify an immersion time; and 2 soaked rigid endoscopes for 45 minutes, and each elevated the temperature of the solution to 25°C. Of the 13 immersing endoscopes in glutaraldehyde for 20 minutes, 2 elevated the temperature above room temperature and 4 did not provide a temperature.

Reported infections: The number of reported infections following rigid endoscopy was low. Five (6%) of the 85 respondents reprocessing rigid endoscopes reported infections. *Staphylococcus aureus* was the contaminating microorganism reported by one respondent.

Reusing single-use devices: Few (n=9, 6%) of the 146 respondents reported outsourcing instruments to a third-party company. Two, however, indicated that they would be soon, and 6 either were not sure or did not provide a response. Outsourced items reported include: *EP catheters*, *SCD sleeves*, *arthroscopic burrs and blades*, *pulse oxymeters*, *several types of OR instrument sets*, *biopsy forceps*, and *opened but unused sutures*.

Almost half (n=65, 45%) of the 146 respondents reported that their facility reused single-use items. Two types of practices were described: *Practice 1*, defined as reprocessing and reusing opened, but unused, disposable items; and *Practice 2*, defined as reprocessing and reusing disposable items that had previously been used on a patient. Seventeen

(26%) of these 65 respondents exercised only *Practice 1*, while 10 (15%) exercised only *Practice 2*. Thirty-one (48%) of the respondents that reused disposable items exercised both types of practices. (Seven [11%] respondents did not specify which of these 2 practices their facility exercised.) Reused disposable items included: *balloon dilators (ie, pyloric, esophageal)*, *retrieval balloons*, *biopsy forceps*, *EP catheters and other types of cardiac cannulae*, *bicap probes*, *ERCP papillotomes and sphincterotomes*, *bite blocks*, *snare*, *stent introducers*, *guidewires*, *oxysensor probes*, and *arthroscopic blades and burrs*.

Several different types of biocidal agents were used to reprocess these disposable items. Of the 79 responses provided by the 65 respondents, EtO, pressurized steam and glutaraldehyde represented 23% (n=18), 18% (n=14), and 14% (n=11) of the responses, respectively. The *SSI* and *Sterrad*™ represented 4 (5%) and 2 (3%) of the responses, respectively. Twenty-five respondents did not specify a reprocessing method.

None of the 65 respondents reported that reusing a disposable item had injured a patient. (Three were unsure and 7 did not provide a response.) In general, patients were not informed when a disposable item had been reused during the procedure, although 2 reported that "sometimes" the patient was informed, 5 were not sure, and 12 did not provide a response. Fifteen (23%) respondents reported that when a disposable item is reused, the patient (or an insurance company) is always billed the price of a new disposable item.

Next month:

Part 2: Discussion of results

Thank you for your interest in this newsletter. *I have addressed each issue to the best of my ability. Respectfully, the Publisher: Lawrence F. Muscarella, PhD. Please return completed survey to:*

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