The Pacific Northwest Laboratory Medicine Sentinel Monitoring Network
Final Report of the Findings of Questionnaire 10
Point of Care Testing

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BACKGROUND

The Pacific Northwest Laboratory Medicine Sentinel Monitoring Network was created in January 1995 to gather ongoing information about practices in hospital, independent and physician office laboratories. To date, ten questionnaires have been released to the network, exploring a variety of issues, such as: testing quality; access to testing services; laboratory-related problems and errors; personnel training and changes; proficiency testing participation; and point of care testing. The data gathered thus far have provided network participants, interest groups and regulators with information about trends in laboratory medicine, based on actual practices and experiences in testing facilities.

QUESTIONNAIRE 10

In January 1999, Questionnaire 10 was mailed to 188 network facilities, which were categorized as a hospital, clinic, community or rural health clinic, health department or district, or independent laboratory. The intent of this questionnaire was to ask:

· Where are point of care (POC) tests performed; what tests are done at POC locations; and who performs these tests at these locations?
· Who trains POC testing personnel and who oversees POC test monitoring activities?
· What are the sources of problems or errors with POC testing?
· What tests have been discontinued at POC locations and why?

We intentionally did not send this questionnaire to network sites identified as physician office laboratories (POLs) because we anticipated that testing in most POLs would be considered POC testing. For this survey, we were interested in POC testing performed at sites other than POLs.

149 network participants returned a completed questionnaire in time for analysis, a 79% response rate. Demographic characteristics of the respondents are summarized in Table 1.

Table 1 - Questionnaire 10 respondents (N=149)

Demographic characteristic	Percent
STATE	
Alaska	8
Idaho	17
Oregon	20
Washington	55
SITE TYPE	
Hospital	58
Clinic; Community or rural health clinic; Health department or district.	18
Independent laboratory	23
CENSUS BUREAU DESIGNATION	
Urban	47
Rural	53

FINDINGS

Where is point of care testing performed?

Network participants were asked, "Does your facility currently perform any point of care testing?" and "Where is point of care testing performed?" For the purpose of this questionnaire, we defined point of care testing as follows: "Laboratory tests performed at a location near the patient, outside the physical confines of the facility's clinical laboratory. Also called near-patient testing. Locations may include: nursing stations; patient bedsides; patient examination rooms; emergency departments; surgical areas; critical care/intensive care units; blood drawing stations; health fairs."

One hundred nineteen of all the respondents (80%) stated that they performed POC testing. We found that 100% of the hospitals performed POC testing, primarily at nursing stations, emergency departments, patient bedsides and intensive care units. Sixty-seven percent of the clinics and health departments performed POC testing, primarily in patient examination rooms. Forty percent of the independent laboratories performed POC testing, primarily at nursing stations, examination rooms and specimen collection stations. (We note that 64% of the independent laboratories performing POC testing are either hospital-based or part of a large clinic. This would explain the

amount of POC testing being performed at locations in independent laboratories, which would not typically be expected in a stand-alone reference laboratory.

Table 2 shows the frequency with which respondents performed POC testing, according to various demographic characteristics and Table 3 shows the percentage of responses for each type of location where POC testing is performed.

Table 2 – Point of care (POC) testing

Demographic characteristic	**Number of respondents**	**Percent that perform POC testing**
Laboratory type		
Clinics, Health departments	27	67
Hospital	87	100
Independent	35	40
Census bureau designation		
Urban	70	71
Rural	79	87
Laboratory size (annual test volume)		
<10,000	33	67
10,001 to 50,000	34	76
50,001 to 100,000	12	100
>100,000	66	85

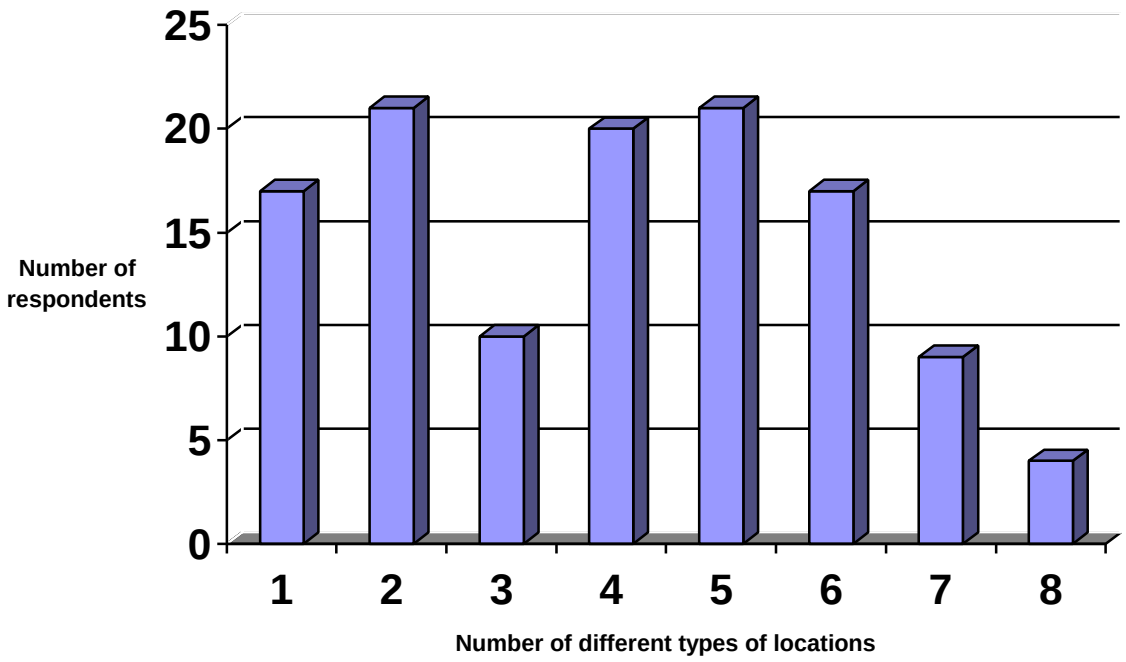
Table 3 – Where is POC testing performed?

Location	**Percent of responses**			
	All respondents	Clinics, health departments	Hospitals	Independent
Nursing station	76	28	87	64
Emergency room/department	67	6	86	29
Patient bedside	66	11	84	21
Intensive care, critical care unit	53	0	70	14
Patient examination room	48	78	43	43
Surgical area	35	6	43	29
Health fair	21	11	24	14
Specimen collection station	15	22	9	43
Other*	15	11	24	29

*Other locations include: Pulmonary laboratory; hospital clinic; blood donor site; nursery; obstetrics department; vascular/ cardiac catheterization/angioplasty laboratory; accident locations; air transport jet; doctor's office clinic; long term care; radiology; cardiac rehabilitation department; pharmacy; IV/transfusion department; home health; urgent care; occupational medicine; dialysis.

The respondents performed POC testing at an average of 4 different locations within their facility. Figure 1 shows a frequency distribution of the number of different POC testing locations for these respondents.

Figure 1 – POC testing locations



What tests are performed at point of care locations?

For each location checked, participants were asked to write the name of the test(s) performed.

We found 29 different tests being performed at POC locations, with glucose testing being the most popular test. Urinalysis and occult blood were the next most common tests, each performed by less than half the respondents. Each of the remaining 26 analytes were performed by less than 15% of the facilities responding. Table 4 shows all tests given in order of frequency.

Table 4 – Tests performed at POC

Test	Percent of respondents that perform the test		Test	Percent of respondents that perform the test
Glucose	90		Ethanol	2
Urinalysis	41		Complete blood count	2
Occult blood	37		pH , fluid	2
Arterial blood gases	14		Lipid panel	2
Hemoglobin or Hematocrit	12		Drugs of abuse screen	1
Pregnancy test	11		Helicobacter pylori	1
Activated clotting time	11		Gram's stain	1
Strep antigen test	9		Rh factor	1
Cholesterol	7		Blood urea nitrogen	1
Prothrombin time	7		Creatinine	1
Microscopic examinations	6		Erythrocyte sedimentation rate	1
i – Stat™ *	5		Bleeding time	1
Specific gravity	5		Chemistry profile	1
Electrolytes	4		Blood culture	1
Hemoglobin A1C	3			

* Trademark name of a portable test system capable of performing one or all of the following analytes: Arterial blood gases, sodium, potassium, chloride, glucose, blood urea nitrogen, ionized calcium, and hematocrit.

The respondents performed an average of 3 different tests at POC locations in their facility. Figure 2 shows a frequency distribution of the number of different tests performed by these respondents.

Figure 2 – POC tests

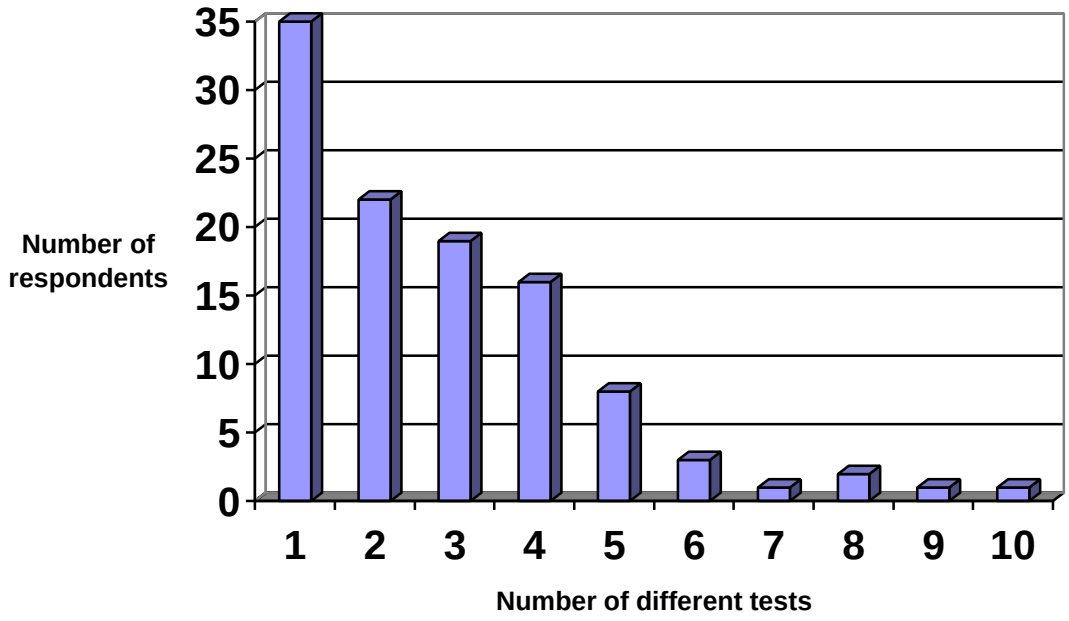


Table 5 summarizes all POC tests and the locations where they are performed.

Table 5 – Where are POC tests performed?

Test	Locations – Number of responses								
	Nursing Station	Emergency Department	ICU CCU	Surgery	Specimen Collection	Bedside	Exam Room	Health Fair	Other
Chemistry									
Arterial blood gases	4	5	7	8	1	2			2
Blood urea nitrogen					1				
Chemistry profile	1						1		
Cholesterol								8	
Creatinine					1				
Drugs of abuse	1								
Electrolytes	2	2	1	3	2	1			
Ethanol		1			1				
Glucose	78	74	59	33	12	69	38	20	12
i – Stat ™	1	4	2	1		1	1		1
Lipid profile								2	
Occult blood	26	26	20	4	1	19	21		3
pH, fluid	2						1		
Specific gravity	2		3	1					
Urinalysis	27	29	13	1	3	8	14		6
Urine pregnancy	5	4			2		2		3
Hematology									
Activated clotting time	3	1	7	9					5
Bleeding time					1				
Complete blood count	1				1		1		
ESR					1				
Hemoglobin/hematocrit	2	2	1	3	3	1	1		2
Hemoglobin A1C	1				2				
Prothrombin time	1			1	3		5		2
Microbiology									
Blood culture	1						1		
Gram's stain	1								
H. pylori				1					
Strep antigen	2	6					2		2
Microscopic exams	2						3		1
Rh factor					1				

Who performs point of care testing?

For each location checked, participants were asked to choose from a list of different types of personnel to describe those performing POC testing.

We found a wide variety of personnel performing POC testing. Registered nurses and licensed practical nurses were the most common personnel at nearly every POC location. Medical technologists and technicians accounted for 6% of the responses about POC testing personnel. In specimen collection stations, medical technologists and technicians and phlebotomists were the most common personnel. Registered nurses and medical technologists and technicians were primarily testing personnel at health fairs. Table 6 shows the responses for each type of personnel doing POC testing and Table 7 summarizes all POC testing personnel and the locations where they perform testing.

Table 6 - Who performs POC testing?

Type of personnel performing POC testing	Percent of responses
Registered nurse (RN)	42
Licensed practical nurse (LPN)	24
Medical assistant (MA)	10
Medical technologist, technician (MT, MLT)	6
Medical doctor (MD)	5
Phlebotomist	4
Respiratory therapist	2
Perfusionist	1
Other *	4

*Other types of personnel include: Nurse practitioners; physician assistants; certified nursing assistants; emergency medical technicians; cardiovascular technicians; catheterization lab technician; diagnostic imaging staff; endoscopy technicians; exercise physiologists; health care assistants; lay health workers; paramedics; pharmacists; radiology technicians; Women/Infant/Children (WIC) certifier; physical therapists; patient care technicians; pulmonary technicians; laboratory technicians.

Table 7 – Where do personnel do POC testing?

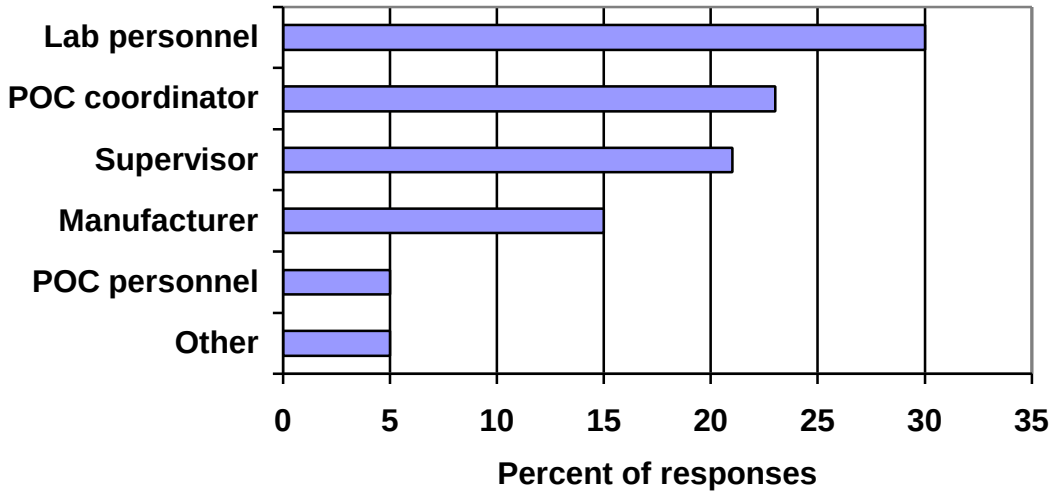
Personnel	Location – Number of responses								
	Nursing Station	Emergency Department	ICU/ CCU	Surgery	Specimen Collection	Bedside	Exam Room	Health Fair	Other location
RN	82	76	58	35	6	73	48	16	16
LPN	56	39	24	18	4	47	30	9	6
MA	22	15	9	5	4	13	26	3	3
MD	7	12	4	9		3	16		2
MT or MLT	7	7	4	3	9	8	9	12	
Phlebotomist	4	4	4	1	13	6	2	7	
Respiratory therapist	4	4	9	2		2	1	1	
Perfusionist				10					1
Other personnel	5	8	2	1	2	7	8	2	8

Who trains point of care testing personnel?

Network participants were asked "Who primarily trains point of care testing personnel in your facility?"

Laboratory personnel were given most frequently as the types of individuals who train POC testing personnel (30% of all responses), followed by point of care coordinators/supervisors (23%) and the supervisors of the point of care testing personnel (21%). Figure 3 shows the different types of personnel that train POC testing personnel.

Figure 3 – Who trains POC testing personnel?



Other types of personnel include: Nursing educators, preceptors, charge nurses; supervisor of the blood gas laboratory; and personnel from both nursing and laboratory.

Thirty of the 118 respondents (25%) indicated that they had a point of care coordinator or supervisor. Over half of these individuals (52%) had a nursing background and more than one third (35%) had a laboratory background. The remaining point of care coordinator/supervisors had the following backgrounds: Blood bank specimen collector; someone trained on the procedure; one individual who is both a registered nurse and a medical technologist; and a combination of individuals from nursing, laboratory and education departments.

Who oversees point of care monitoring activities?

Using a list of different types of personnel backgrounds, participants were asked to indicate the background of the individual overseeing or supervising each of seven POC testing monitoring activities.

The responsibilities for personnel competency assessment and review of patient test results fell primarily on the supervisor of the personnel performing the POC testing. The monitoring of compliance with POC test procedures and policies was split between supervisors of the personnel and laboratorians. Evaluation of quality control, proficiency testing and blind testing results, problems, equipment or test failures and test selection were primarily delegated to laboratory staff. Table 8 summarizes the monitoring activities and the types of personnel who supervise or oversee each of them.

Table 8 – Who oversees monitoring activities?

Activity	Background of personnel – Percent of responses						
	Supervisor	Testing personnel	Lab personnel	POC coordinator	No one oversees	Don't know	Other*
Personnel competency assessment	44	4	25	20	1		5
Compliance with procedures	37	4	35	19	2		3
Evaluation of quality control, proficiency testing, blind samples	20	5	53	18	<1	<1	4
Evaluation of patient test results	35	25	23	9	2	3	2
Evaluation of problems and errors	29	13	39	17	<1	<1	1
Resolution of equipment/test failures	28	10	43	18	<1		1
Selection of POC instruments/tests	28	4	40	15	1	4	8

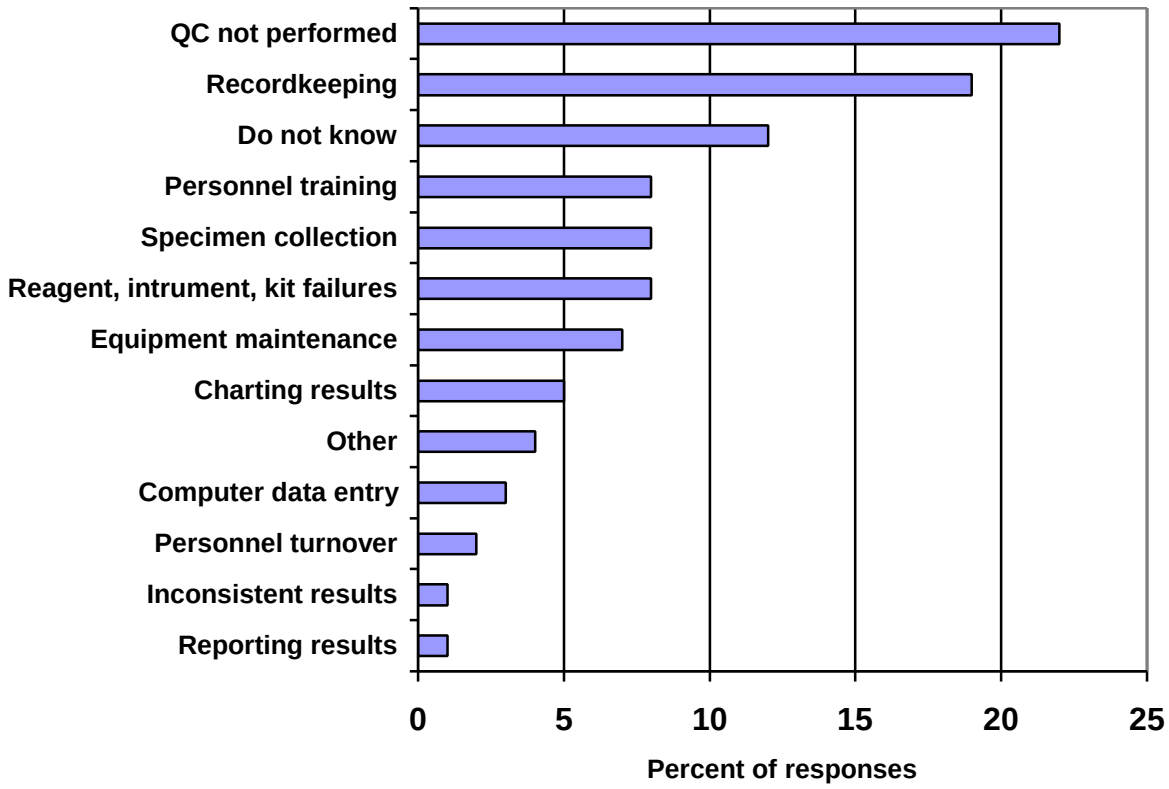
*Other types of personnel include: Nursing educator, nurse; group decision, multi-disciplinary team, patient care committee; clinic network; supervisor of blood gas laboratory; doctor; biomedical staff; purchasing staff; educational coordinator; patient care technician trainer; and state auditor.

Sources of problems or errors with point of care testing

Participants were asked to choose from a list their most common source of problems or errors with POC testing in their facility.

The most common problems related to quality control not being performed as required (22% of responses) and record keeping issues (19% of responses). None of the respondents noted inaccurate results as a problem. Figure 4 shows all responses about problems or errors with POC testing.

Figure 4 – Sources of problems or errors with POC testing



Other problems listed include: Operator error; billing losses; not confirming critical results; and no problems.

What tests have been discontinued at point of care locations?

Participants were asked "In the past 2 years, have any point of care tests been discontinued at any point of care location and returned to the laboratory for test performance? If Yes, what tests and why?"

Ten percent of respondents answered that they had discontinued testing at a POC location. A total of 23 tests were discontinued by these facilities. The most common reasons for discontinuing testing at POC related to quality control (not willing to do QC; not being documented; compliance issues; not meeting accredited laboratory QC requirements) [41% of all responses] and personnel issues (problems with personnel; competency; training) [24%]. Table 9 shows the types of tests that were discontinued and the reasons given.

Table 9 – Tests discontinued at POC locations

Reason	**Tests discontinued – Number of responses**										
	UA	Occult blood	ABG	HCG	Clo test	Hgb A1C	Stool reducing substance	ACT	Urine drug screen	Strep antigen	Glucose
Quality control issues	5	3		1	1	1		1	1		1
Personnel training	2		1								1
Personnel competency	3										1
Cost issues			2								
Record keeping issues	1							1			
Test is not waived	1						1				
Standardized to one type	1										
QC required too much time	1										
Duplicate testing	1										
Inconsistent results	1										
Reagent/kit failure										1	
Staff not complying with proficiency testing requirements								1			

(UA=Urinalysis; ABG=Arterial blood gases; HCG=Human chorionic gonadotropin [pregnancy test]; Hgb A1C=Hemoglobin A1C; ACT=Activated clotting time)

CONCLUSION

Although we found a wide range of tests being performed at many different POC locations, the long-standing, commonly-used tests were still the most popular – glucose, urinalysis and occult blood testing. With the advent of many new easy-use, portable test systems for clinically important analytes, we expected to see more of these in use at POC locations. However, prothrombin times, blood gases, electrolytes, hemoglobins, hematocrits and lipids were performed by fairly low numbers of our respondents at POC. None of our respondents tested for cardiac markers (creatine kinase, CK-MB, myoglobin and troponin) at POC, despite recent attention given to these analytes.

This low frequency of testing at point of care (beyond the top three tests) may demonstrate that laboratories in these facilities are meeting the needs and/or expectations for turnaround time, costs and other key aspects in the delivery of laboratory services. It may also reflect reluctance by the laboratories to give up testing to other locations in the facility. Alternately, these findings may represent the reluctance of personnel in other areas to take on the additional responsibility of POC testing for any but the most common tests.

Twenty-seven different types of personnel were performing POC testing, posing a challenge to these facilities to adequately train individuals and monitor key activities such as quality control, record keeping, reporting and competency assessment. The laboratory staff appear to play a key role in training POC testing personnel, in addition to being the most common type of personnel responsible for assuring that quality control is performed and problems and equipment issues are addressed.

We found that inaccurate test results, associated with POC testing, were not a concern for our respondents.

With laboratory testing taking place in so many types of locations, it has become difficult to define the terms “hospital laboratory“, “independent laboratory” and “physician office laboratory” and to categorize these testing sites as one type of laboratory or another. The connotation of independent laboratories as large, stand-alone entities has been challenged by the respondents in our network who operate within hospital and clinic settings, yet designate themselves as independent laboratories.