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## Major article

## Compliance with standard precautions: Results of a French national audit



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## Key Words:

Assessment  
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Standard precautions

**Background:** Standard precautions (SPs) aim to reduce the risk of cross-transmission of microorganisms. The objectives of the present study were to assess institutional policies for SPs promotion, available resources for SPs implementation, and education of health care workers (HCWs) and their compliance with SPs.

**Methods:** A multisite mixed-methods audit was conducted in 2011. Self-assessment questionnaires were administered at institution, ward, and HCW levels in French health care facilities (HCFs). Results were given as percentage of objectives achieved (POA) or percentage of “never or sometimes,” “often,” and “always” responses for each question.

**Results:** A total of 1599 HCFs participated, including 14,968 wards and 203,840 HCWs. At an institutional level, the POA was 88%, covering SPs promotion (91%), procedures (99%), and SPs evaluation (63%). At the ward level, the POA was 94%, covering procedures (95%) and resources (93%). HCWs reported the best compliance for changing gloves between patients (94.5% “always”), and the worst compliance for the use of gloves for intramuscular injection and the use of eye protection in cases of blood exposure risk (34.5% and 24.4% of “always,” respectively).

**Conclusions:** A literature review found no other study of SPs that included such a large study group. These results led to SPs promotion actions at local and regional levels. Reinforcement of SPs observance will be prioritized in the next national program from the French Ministry of Health.

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Standard precautions (SPs) aim to protect health care workers (HCWs) and patients from infectious diseases due to blood-borne pathogens and to prevent cross-transmission. SPs must be applied by each HCW in all situations, regardless of the patient’s infectious status.<sup>1</sup> In France, the 2009-2013 National Program for Nosocomial Infection Prevention planned the assessment of HCW

compliance with SPs in health care facilities (HCFs).<sup>2</sup> The French Group for Infection Control Practice Assessment (GREPH), comprising experts from the 5 Coordinating Centers for Healthcare-Associated Infection Prevention and Control (CClin), developed an audit tool to assess SPs implementation. The French Ministry of Health encouraged French HCFs to undertake this audit in 2011.<sup>3</sup>

At the institutional level, the objectives of this audit were to assess institutional policies for SPs promotion, availability of resources for SPs implementation, and HCWs’ education and compliance with SPs. At the national level, the objectives were to assess SPs on a large scale and to produce references for comparing hospitals.

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Conflicts of interest: None to report.

**Table 1**  
Theme grouping and score calculation for institutional questionnaire

Assessed criterion Themes Questions	Assigned score to each question	Maximum expected score by theme	Global expected score
SPs promotion			10
SPs promotion program		3	
1. Implemented program	3 if yes		
2. Planned program	1 if yes		
Newcomer training (at least 1 category)		4	
3. Physicians	4 if yes		
4. Nonmedical personnel	4 if yes		
5. Others	4 if yes		
OBE surveillance		3	
6. BE surveillance	3 if yes		
Procedures			10
SPs procedure		5	
7. Written	2 if yes		
8. Validated	1 if yes		
9. Available	2 if yes		
Procedure to be followed in the event of OBE	5		
10. Written	2 if yes		
11. Validated	1 if yes		
12. Available	2 if yes		
SPs evaluation			5
13. Global	5		
14. Partial	2.5		
Global score at institutional level			25

OBE, occupational blood exposure.

## MATERIALS AND METHODS

### Definition

SP recommended in France and evaluated in this study meet the definition of the Centers for Disease Control and Prevention.<sup>4</sup>

### Design and population

This study, involving a mixed methods audit of policies, procedures, available equipment, and self-reported training and practices of HCWs regarding SP implementation, was conducted between February 1 and December 31, 2011. Inclusion criteria were (1) a voluntary public or private HCF in France; (2) medical, surgical and medicotechnical wards in the HCF; and (3) HCWs in charge of patients in these wards. In each HCF, the infection control team decided which ward and HCWs to include in participation, depending on the ward activity and the number of HCWs per ward.

### Data collection

Self-assessment questionnaires were administered on an anonymous basis at 3 levels, covering the following criteria: (1) SP promotion policy, procedures, and evaluation at the institutional level; (2) available equipment and procedures at the ward level; and (3) training and self-reported compliance at professional level. Data collected were analyzed with Excel software (Microsoft, Redmond, WA) program by the infection control team at each HCF and centralized in the South-Eastern Cclin.

### Statistical analysis and presentation of results

At both the institutional and ward levels, results were recorded as percentage of positive answers to each question and as percentage of objective achieved (POA) by theme (ie, groups of

**Table 2**  
Theme grouping and score calculation for ward questionnaire

Assessed criterion Themes Questions	Assigned score to each question	Maximum expected score by theme	Global expected score
Procedures			10
SP procedure		5	
1. Written	3 if yes		
2. Available	2 if yes		
Procedure to be followed in the event of OBE:		5	
3. Written	3 if yes		
4. Available	2 if yes		
Resources			18
Available equipment		8	
5. Hydroalcoholic solution	1 if yes		
6. Hand soap	1 if yes		
7. Nonsterile single-use gloves	1 if yes		
8. Gowns/plastic aprons	1 if yes		
9. Masks	1 if yes		
10. Eye protection	1 if yes		
11. Sharps containers	1 if yes		
12. Bleach	1 if yes		
Appropriate location for hydroalcoholic solution		4	
13. Central nursing station	2 if yes		
14. Next to medical care	2 if yes		
Correct use of sharps containers		3	
15. Nursing station	1 if yes		
16. Next to medical care	1 if yes		
17. Boundary filling	1 if no or NA		
Suitable means of transportation		3	
18. Specimen	1 if yes or NA		
19. Linen	1 if yes or NA		
20. Instrument	1 if yes or NA		
Global score at ward level			28

NA, not applicable; OBE, occupational blood exposure.

questions). A weight was attributed to each question according to its importance. This led to the calculation of a score obtained and a maximal expected score for each theme (Tables 1 and 2). The POA was calculated using the following formula: obtained score  $\times$  100/ expected score.

At the professional level, results were given as percentage of responses reported as "never or sometimes," "often," and "always" for each question. Hereinafter, percentages of "always" responses are given unless specified otherwise. Calculations excluded HCWs for whom the question was not applicable. Responses with a frequency of "always" >80% were considered as "encouraging results," whereas those with a frequency of "never or sometimes" >20% were considered to indicate "priority actions."

### Validity and reliability

A national panel of experts in infection control designed the 3 questionnaires, merged the questions by theme, and assigned the weighting of the responses according to their priority for SP implementation. The audit tools were tested by 6 local, regional, and teaching hospitals, both public and private. The final version was validated by the GREPHH.

## RESULTS

### Participation

A total of 1599 HCFs participated in the study, including 14,968 wards and 203,840 HCWs. The participating acute care HCFs represented 64.4% of the acute care HCFs in France. The

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