

# Données épidémiologiques spécifiques de la radiologie interventionnelle

04/12/2015

## Etat des lieux

- ◆ Peu de littérature récente apportant des données épidémiologiques sur la fréquence des AES, malgré le nombre croissant d'actes interventionnels effectués en radiologie.
- ◆ De plus
  - ◆ actes très diversifiés
  - ◆ risque différent selon la procédure.

FRI : Fédération de la radiologie interventionnelle

## La radiologie interventionnelle en France en 2007

### Activités de Radiologie Interventionnelle en France par région

Inter région	Région	En données				En pourcentage		
		Nb de centres	Nb de radiologues	Nb de R.I.	Nb RI par radiologues	Centres	Radiologue	R.I.
1 Ile de France	11 Ile-de-France	71	240	55 799	233	25%	20%	32%
	22 Picardie	2	14	891	64	1%	1%	1%
	23 Haute-Normandie	6	32	3 878	121	2%	3%	2%
2 Nord Ouest	25 Basse-Normandie	8	32	5 068	158	3%	3%	3%
	31 Nord-Pas-de-Calais	9	36	7 172	199	3%	3%	4%
	24 Centre	15	81	10 110	125	5%	7%	6%
3 Ouest	52 Pays de la Loire	12	49	5 424	111	4%	4%	3%
	53 Bretagne	14	66	11 554	175	5%	6%	7%
	54 Poitou-Charentes	4	27	1 043	39	1%	2%	1%
	21 Champagne-Ardenne	5	21	987	47	2%	2%	1%
	26 Bourgogne	3	9	1 048	116	1%	1%	1%
4 Est	41 Lorraine	11	31	2 038	66	4%	3%	1%
	42 Alsace	7	19	1 927	101	2%	2%	1%
	43 Franche-Comté	2	2	200	100	1%	0%	0%
	72 Aquitaine	19	79	3 758	48	7%	7%	2%
5 Sud Ouest	73 Midi-Pyrénées	11	41	4 159	101	4%	4%	2%
	74 Limousin	2	6	1 299	217	1%	1%	1%
	82 Rhône-Alpes	40	186	30 783	166	14%	16%	17%
6 Sud Est	83 Auvergne	5	26	3 076	118	2%	2%	2%
	91 Languedoc-Roussillon	16	68	5 265	77	6%	6%	3%
7 Sud Méditerranée	93 Provence-Alpes-Côte d'Azur	26	106	21 358	201	9%	9%	12%
Total France		288	1 171	176 837	151			

230128 en 2009

300 centres en radiologie interventionnelle thérapeutique

1200 radiologues qui pratiquent quotidiennement

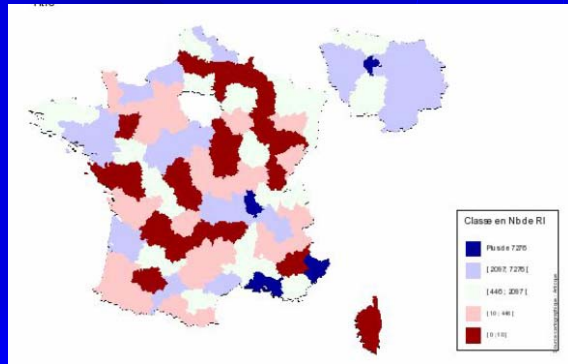
En moyenne 151 actes par radiologue sur une année

## Actes de cancérologie

- ◆ 330 000 actes diagnostiques (biopsies)
- ◆ 132 000 actes thérapeutiques « classés cancer » :
  - 110 000 poses de voie veineuse centrale
  - 21 000 actes thérapeutiques hors poses de cathéters.

Ces actes thérapeutiques sont essentiellement des actes endocanalaire (10 500 cas), traitement de la douleur (1400 cas) et ablation tumorale (1700 cas).

## Départements sans radiologie interventionnelle (n'ayant pas répondu à l'enquête)



## Risques en fonction du pathogène

- ◆ HIV 0,3 – 0,4 %
- ◆ VHB 12 %
- ◆ VHC 3% (*Vijayanathan BIJ 2006*)
  
- ◆ Taux de VHC positifs en RI 9,7 % (*Baffoy JCVIR 2003*)

### Needle-Stick Injuries and Blood Contacts During Invasive Radiologic Procedures: Frequency and Risk Factors

Margaret E. Hansen<sup>1</sup>  
George L. Miller III<sup>1</sup>  
Helen C. Redman<sup>1</sup>  
Donald D. McIntire<sup>2</sup>

**OBJECTIVE.** Possible nosocomial transmission of blood-borne pathogens is a serious concern for health care workers and patients alike. Needle-stick injuries and blood contacts pose a risk of pathogen transmission during procedures. We performed a study to determine the frequency of injuries and blood contacts during invasive radiologic procedures and to examine procedure-related factors that may increase risk of injury or exposure.

**SUBJECTS AND METHODS.** A prospective study of needle-stick injuries and blood contacts during invasive radiologic procedures was performed. During a 10-week period, information about procedures was recorded by technologists or physicians, and needle-stick injuries and exposures to patients' blood and body fluids were noted. Data were analyzed with the SAS statistical package.

**RESULTS.** Accidental exposure to patients' blood and body fluids occurred in 15 of 501 cases (3.0%; 95% confidence interval, 1.7–4.9%). Of 729 operators at risk, 15 were exposed (2.0%; 95% confidence interval 1.1–3.3%). Exposure was parenteral in one case and cutaneous in 14. Risk of exposure was correlated with procedure duration ( $p = .003$ ), but not with emergency vs elective procedure status ( $p = .796$ ), procedure type ( $p = .275$ ), or operator experience level ( $p = .554$ ). Three needle-stick injuries (0.6% of cases) occurred, all with sterile instruments; bleeding occurred in two cases. Risk of injury was correlated only with procedure type ( $p = .046$ ). In no case was a patient exposed to a physician's blood.

**CONCLUSION.** Whereas cutaneous exposure of physicians to patients' blood was not infrequent, parenteral exposure was rare in this series. Most of the exposures in this study could have been prevented by the use of protective equipment. Patients' contact with physicians' blood did not occur in this study.

AJR 1993;160:1119–1122

1: [Am J Infect Control](#). 1994 Feb;22(1):1-5.

Use of universal precautions in interventional radiology: results of a national survey.

[Hansen ME](#), [McIntire DD](#), [Miller GL 3rd](#), [Redman HC](#).

Department of Radiology, University of Texas Southwestern Medical Center, Dallas 75235-9071.

**OBJECTIVE:** To determine current use of universal precautions by practicing interventional radiologists in the United States. **METHODS:** National survey mailed to interventional radiologists, conducted anonymously in November 1991. Of 1530 survey forms mailed to practicing interventional radiologists, 817 (53%) were returned and 804 (52%) were completed and evaluable. Both academic and private practice settings were represented. **RESULTS:** Eighty-five percent of respondents had changed their use of infection control measures in the previous 10 years. Of these, 96% cited personal concerns about AIDS as a reason for making changes. Sixty-two percent made changes in response to Centers for Disease Control and Prevention and Occupational Safety and Health Administration recommendations as well. Use of barrier precautions was quite variable. Although 86% of respondents always wore a sterile gown during procedures, only 32% routinely wore a face mask or shield and only 29% of those who did not wear corrective glasses routinely wore protective eye gear during procedures. Seven percent of respondents routinely double gloved for procedures. Twenty percent of reported percutaneous injuries occurred during recapping of used sharps; an additional 6% were related to improper disposal of used sharps. **CONCLUSIONS:** We conclude that use of universal precautions by interventional radiologists in the United States is variable. Some practices that may lead to preventable injury to health care workers remain common.

PMID: 8172369 [PubMed - indexed for MEDLINE]

Accidents d'exposition au sang en radiologie interventionnelle: évaluation des pratiques dans onze services parisiens. N BAFFOY, N LE DU, V SALOMON, P ASTAGNEAU, G BRÜCKER *Feuilles de radiologie 1999 39: 384-386*

## Potential Exposure to Hepatitis C Virus through Accidental Blood Contact in Interventional Radiology

Nadège Raffoy-Fayard, PharmD, Sylvie Maugat MPH, Marc Szpovai, MD, PhD, Philippe Cluzel, MD, PhD, Alban Dreyer, MD, Nicolas Seltzer, MD, Eric Doummes, MD, Paul Leguinau, MD, Vincent Talhaoui, PhD, Gilles Bruckler, MD, and Pascal Astagneau, MD, PhD, for the Study Group on Hygiene Practices in Interventional Radiology

**PURPOSE:** To quantify the prevalence of accidental blood exposure (ABE) among interventional radiologists and contrast that with the prevalence of patients with hepatitis C virus (HCV) undergoing interventional radiology procedures.

**MATERIALS AND METHODS:** A multicenter epidemiologic study was conducted in radiology wards in France. The risk of ABE to radiologists was assessed based on personal interviews that determined the frequency and type of ABE and the use of standard protective barriers. Patients who underwent invasive procedures underwent prospective sampling for HCV serologic analysis. HCV viremia was measured in patients who tested positive for HCV.

**RESULTS:** Of the 77 radiologists who participated in 11 interventional radiology wards, 44% reported at least one incident of mucous membrane blood exposure and 5% reported at least one percutaneous injury since the beginning of their occupational activity. Compliance with standard precautions was poor, especially for the use of protective clothes and safety material. Overall, 5% of 948 treated patients (5.7%) tested positive for HCV during the study period, of whom 90.1% had positive viremia results, demonstrating a high potential for contamination through blood contacts.

**CONCLUSIONS:** The probability of HCV transmission from contact with contaminated blood after percutaneous injury ranged from 0.03 to 0.036; the high frequency of accidental blood exposure and high percentage of patients with HCV could generate a risk of exposure to HCV for radiologists who perform invasive procedures with frequent blood contact. The need to reinforce compliance with standard hygiene precautions is becoming crucial for medical and technical personnel working in these wards.

**Index terms:** Catheters and administration • Hepatitis • Infections • Radiology and radiologists, techniques

J Vasc Med Biol 2005; 14:172-179

**Abbreviations:** ABE = accidental blood exposure, HCV = hepatitis C virus

HEPATITIS C virus (HCV) is one of the blood-borne viruses responsible for millions of cases of chronic hepat-

itis throughout the world (1). In France, prevalence of HCV is estimated to be 1.0%–1.2% in the general population

(2–4). Most cases have been reported in individuals with histories of blood transfusions or intravenous drug use (5). The number of patients who are potentially infected in health-care settings has been poorly estimated until recently. The prevalence rate of HCV reported in hospital-based studies ranged from 5.9% to 24% (6,7). Patients who are chronic carriers of HCV are a source of contamination for health-care personnel in cases of blood contact. The risk of HCV transmission to health-care providers after percutaneous injury has been estimated at 1.8%–3% (8–10). Until now, 33 health-care workers have been reported to

From the Interregional Centre for Interventional Radiology (NDF, SM, C.E., P.A.), Service de Cardiovasculaire Radiologie (N.C.), Hôpital Saint-Joseph, Georges Pompidou, Service de Interventionnel Radiologie (P.L.), Hôpital Saint-Louis, Hôpital Saint-Joseph, Pitié-Salpêtrière, Service de Radiologie (A.D.), Hôpital de Saint-Denis, Service de Interventionnel Radiologie (P.L.), Hôpital Cochin, Paris, Service de Radiologie (D.C.), Hôpital Jean Verdier, Service de Service of Anatomopathologie (S.D.), Institut Cochin, Hôpital Saint-Joseph, Paris. A complete list of the members of the Study Group on Hygiene Practices in Interventional Radiology is given at the end of the article. The study was supported by grants from the In-

stitut de Veille Sanitaire, Saint-Maurice, France. Received May 20, 2005; revision received July 25; final revision received September 2, 2005. Accepted September 4. Address correspondence to P.A., C.C.L.M., Paris Nord, Hôpital Saint-Joseph, 10 rue de Valenciennes, 75006 Paris, France. E-mail: astagneau@hopital-stjoseph.fr. None of the authors has identified a potential conflict of interest. © 2005, 2005 DOI: 10.1097/01.VLM.0000162579.02916.92

## Accidental blood exposure: risk and prevention in interventional radiology

A Vijayananthan<sup>1,1</sup>, MBBS, MRad, LH Tan<sup>2</sup>, MMed, A Owen<sup>3</sup>, BSc, MRCP, FRCR, R Bhat<sup>3</sup>, R Edwards<sup>3</sup>, MBChB, MRCP, FRCR, I Robertson<sup>3</sup>, MBChB, MRCP, FRCR, JG Moss<sup>3</sup>, MBChB, FRCS, FRCR, R Nicholls<sup>3</sup>

<sup>1</sup> Department of Biomedical Imaging (Radiology), Faculty of Medicine, University of Malaya, Kuala Lumpur, Malaysia

<sup>2</sup> Department of Medicine, Faculty of Medicine, University of Malaya, Kuala Lumpur, Malaysia

<sup>3</sup> Department of Radiology, Garraway General Hospital, Glasgow, United Kingdom

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### ABSTRACT

There is a growing concern about the transmission of bloodborne pathogens during medical procedures among health care workers and patients. Over the last three decades, radiological services have undergone many changes with the introduction of new modalities. One of these new disciplines is interventional radiology (IR) which deals with procedures such as arteriography, image-guided biopsies, intravascular catheter insertions, angioplasty and stent placements. Despite these developments, the potential for accidental blood exposure and exposure to other infectious material continues to exist. Therefore, it is important for all radiologists who perform invasive procedures to observe specific recommendations for infection control. In this review, we look at the different policies for protection and universal standards on infection control. © 2006 Biomedical Imaging and Intervention Journal. All rights reserved.

**Keywords:** Interventional radiology, bloodborne pathogens, prevention

### INTRODUCTION

therapeutic procedures involving needles and catheters.

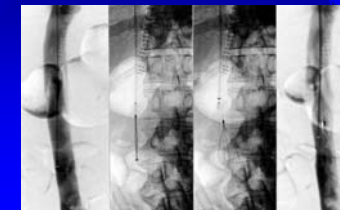
## Une activité en progression

- ◆ **RI oncologique**
  - ◆ chimio-embolisations
  - ◆ Radiofréquence +++
- ◆ **Des risques différents**
  - ◆ RI vasculaire : utilisation brève de matériels piquants, salle dédiée
  - ◆ RI non vasculaire : matériels piquants utilisés de manière itérative, par guidage scanner ou échographique



## 1°) les actes endovasculaires

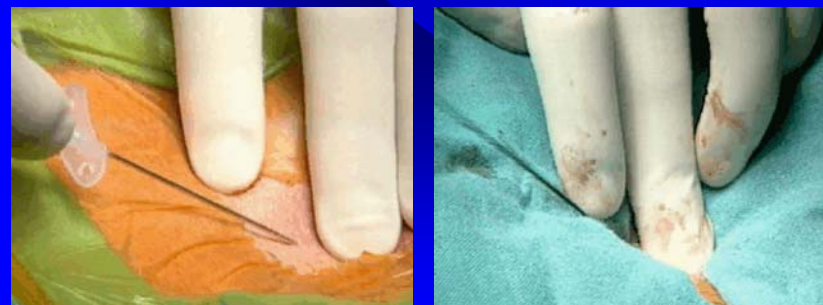
- ◆ Ils comprennent les **angioplasties, désobstructions artérielles, et poses d'endoprothèses.**
- ◆ Les occlusions vasculaires (**embolisations**) peuvent se faire au moyen de micro-particules inertes, de micro ressorts (coils).
- ◆ Les **interruptions de la veine cave inférieure** correspondent en fait à la pose de filtre servant à fragmenter les caillots venant des membres inférieurs.



## Matériel



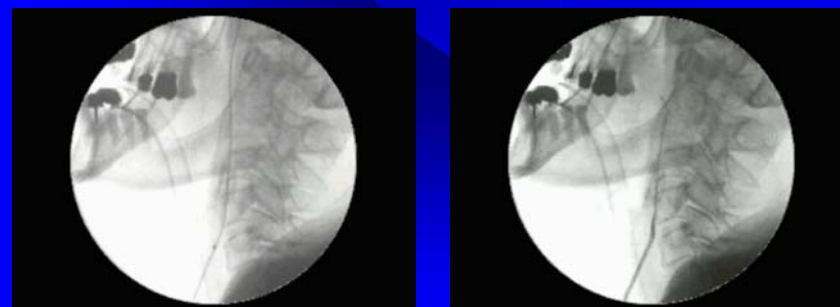
## Procédure



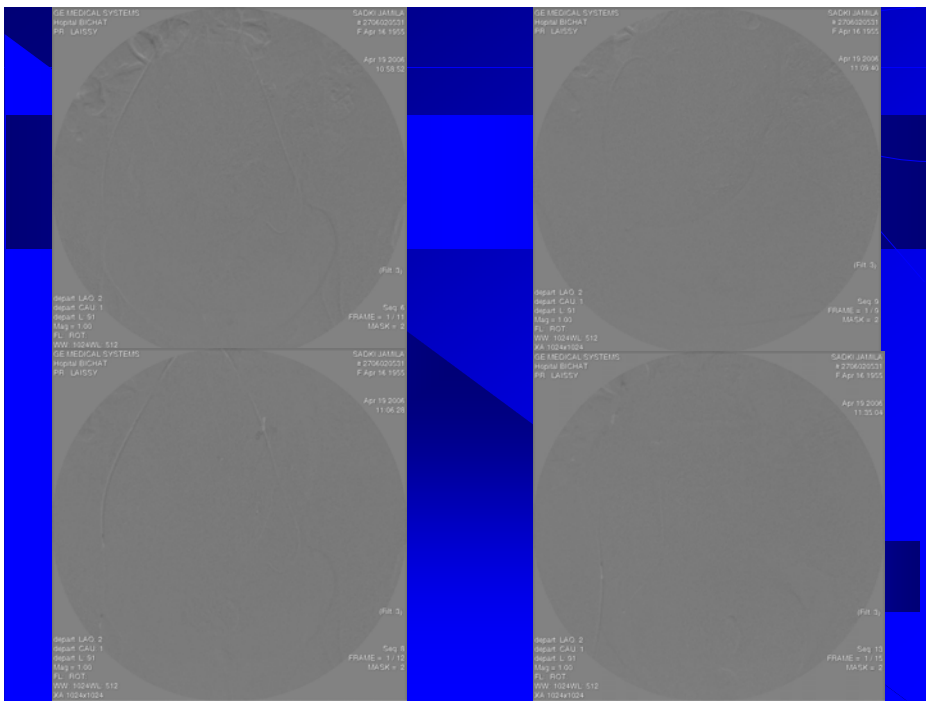
## Ponctions itératives

- ◆ Des moments de grande solitude...

## Acte interventionnel

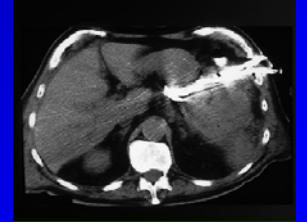




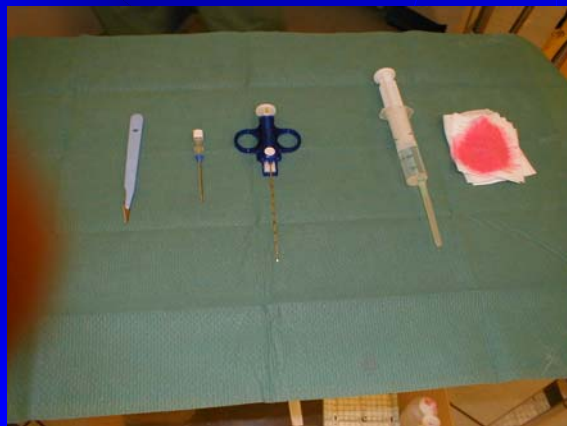


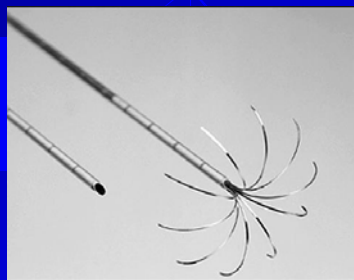
## 2°) les gestes percutanés directs

- ◆ Ils comprennent une multiplicité
  - ◆ d'actes diagnostiques (ponctions)
  - ◆ et des actes thérapeutiques (drainages, destruction tumorale percutanée +++).



## Matériel





## Les risques particuliers

- ◆ Il existe deux types d'accidents d'exposition aux fluides biologiques :
- ◆ La **piqûre**
- ◆ La **projection**.

## La piqûre :

- ◆ Utilisation de trois matériels piquants ou coupants:
  - ◆ l'**aiguille intramusculaire** pour réaliser l'anesthésie locale,
  - ◆ l'**aiguille de ponction**,
  - ◆ le **bistouri**.
- ◆ Autre objet coupant lorsque un drainage est effectué: l'**aiguille sertie** pour fixer un drain à la peau.

## La projection:

- ◆ Elle peut se faire lorsque que l'injection de produit de contraste se fait en hyperpression dans la sonde d'angiographie (injection manuelle); il peut alors y avoir une pulvérisation de produit de contraste mélangé avec du sang.
- ◆ Elle peut également se faire après aspiration de fluide biologique et notamment de pus.

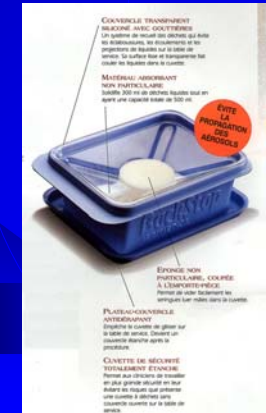


## Les techniques de prévention : piqûres

- ◆ Aucune technique de prévention validée.
- ◆ Aiguilles de ponction pour cathétérisme sans protection. Utilisation itérative d'un Cathlon, (échec de ponction), nécessite de remettre le mandrin dans le Cathlon, = source potentielle de piqûre par le radiologue.
- ◆ Utilisation de coupelles dédiées aux matériels coupants utile.
- ◆ En fait, matériel souillé (aiguilles d'anesthésie, de ponction et bistouri) dans les **conteneurs à aiguilles** dès la fin de leur usage + avertissement à haute voix au personnel paramédical = meilleur moyen de protection.

## Le matériel de prévention

- ◆ **Conteneurs à aiguilles ++**, de grande taille pour pouvoir recevoir et stocker des aiguilles pouvant atteindre 50 cm de long (aiguilles à biopsie transjugulaire).
- ◆ **Cathéters à embout Luer-Lock** pour éviter les accidents de projection.
- ◆ Recueil des fluides biologiques à l'aide de **conteneurs étanches type Backstop**.



## Recommandations

- ◆ 1° éviter l'énerverment et la précipitation (difficile en cas de cathétérisme ou d'abord compliqué, lorsque la procédure se prolonge, et que plusieurs opérateurs travaillent simultanément)
- ◆ 2° jeter le matériel piquant dès son utilisation
- ◆ 3° utiliser des branchements étanches (Luer-Lock)
- ◆ 4° se servir de pinces avec des aiguilles serties pour fixer les drains à la peau

