Primary Immunodeficiency Clinic
Jacques Hébert
CHU de QUÉBEC

Primary immunodeficiencies

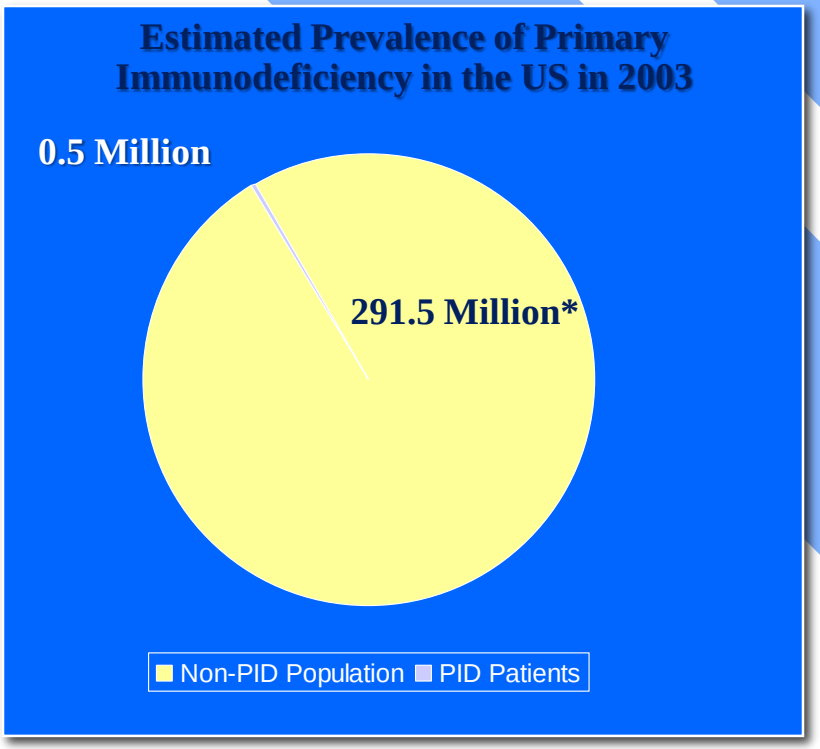
Background

Primary Immunodeficiency (PI)

- Group of >130 heterogeneous disorders
- Hallmark increased susceptibility to infections due to dysfunction or absence of immune response system
- Major manifestations include multiple infections despite aggressive treatment, infections with unusual or opportunistic organisms, failure to thrive or poor growth, and positive family history

Prevalence of Primary Immunodeficiencies

A number of sources indicate there are approximately 500,000 primary immune deficient patients in the US

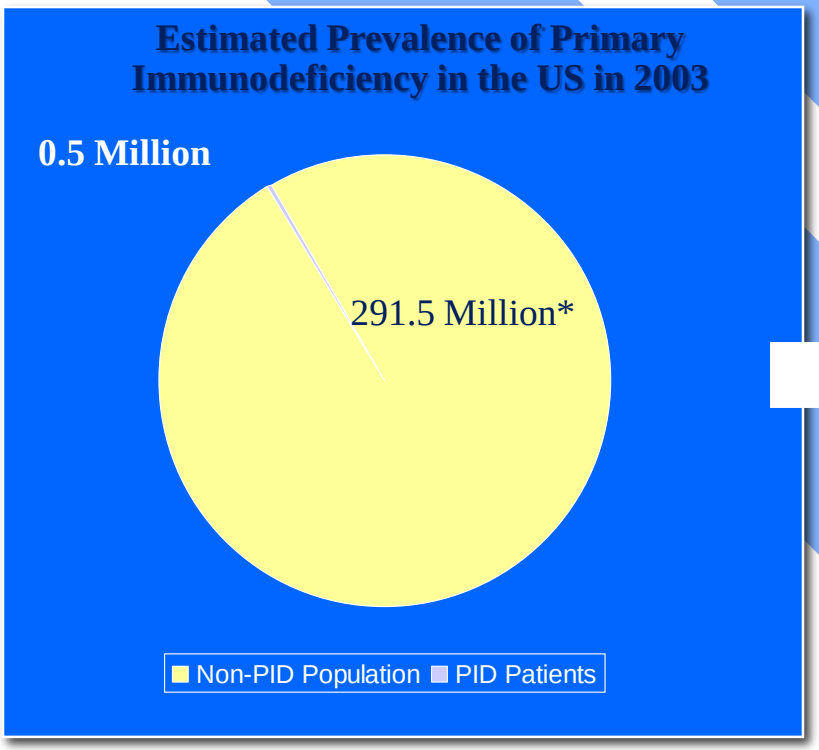


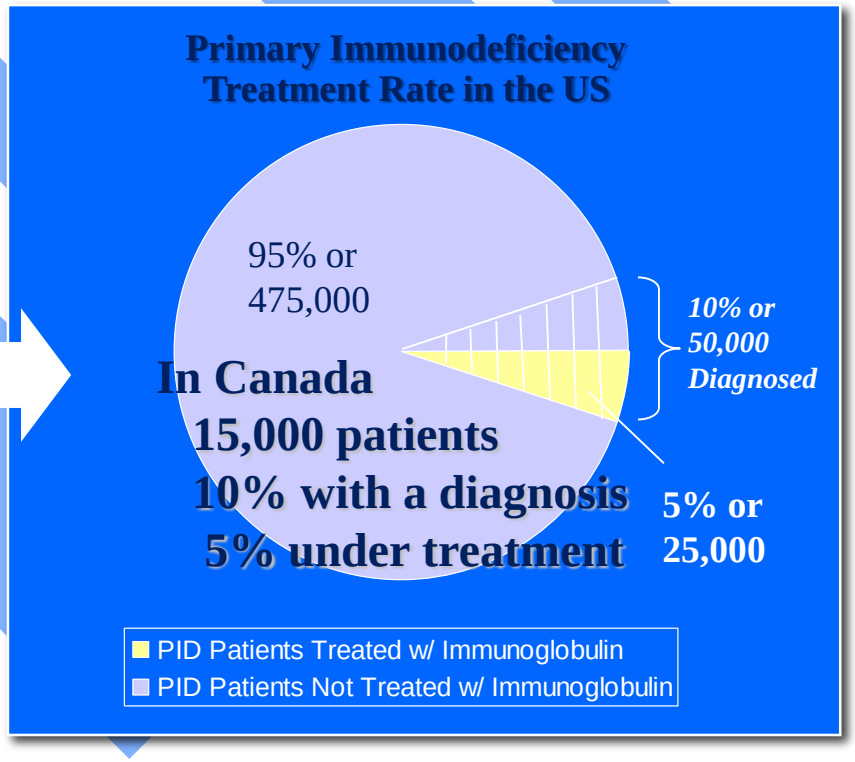
In Canada:
15,000 patients

Prevalence and Treatment of Primary Immunodeficiencies

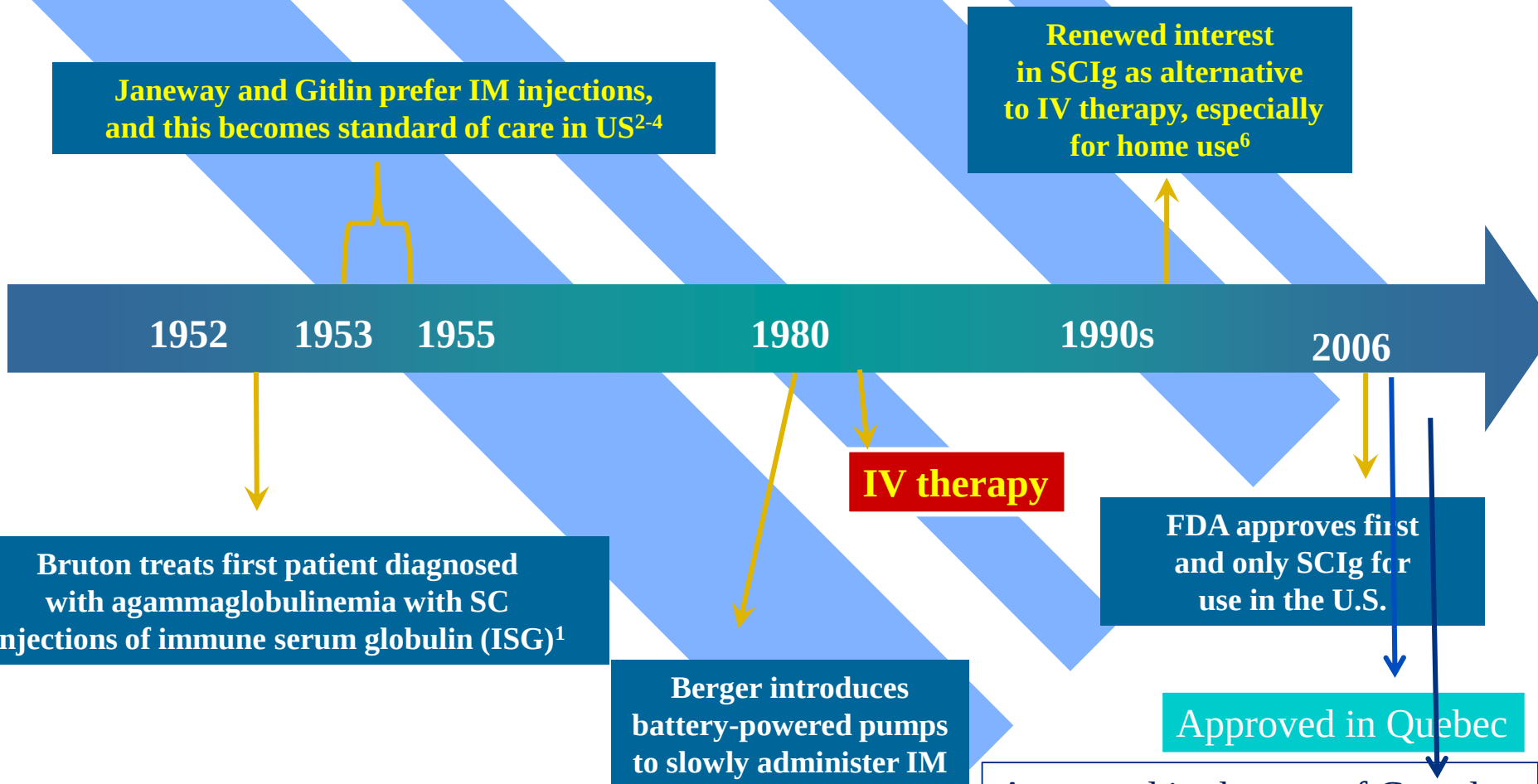
A number of sources indicate there are approximately 500,000 primary immune deficient patients in the US

The immunoglobulin treatment rate is estimated to be approximately 5% of the entire PI population in the US. The immunoglobulin treatment rate is approximately 50% of diagnosed PI





Landmarks in the History of Ig Replacement Therapy



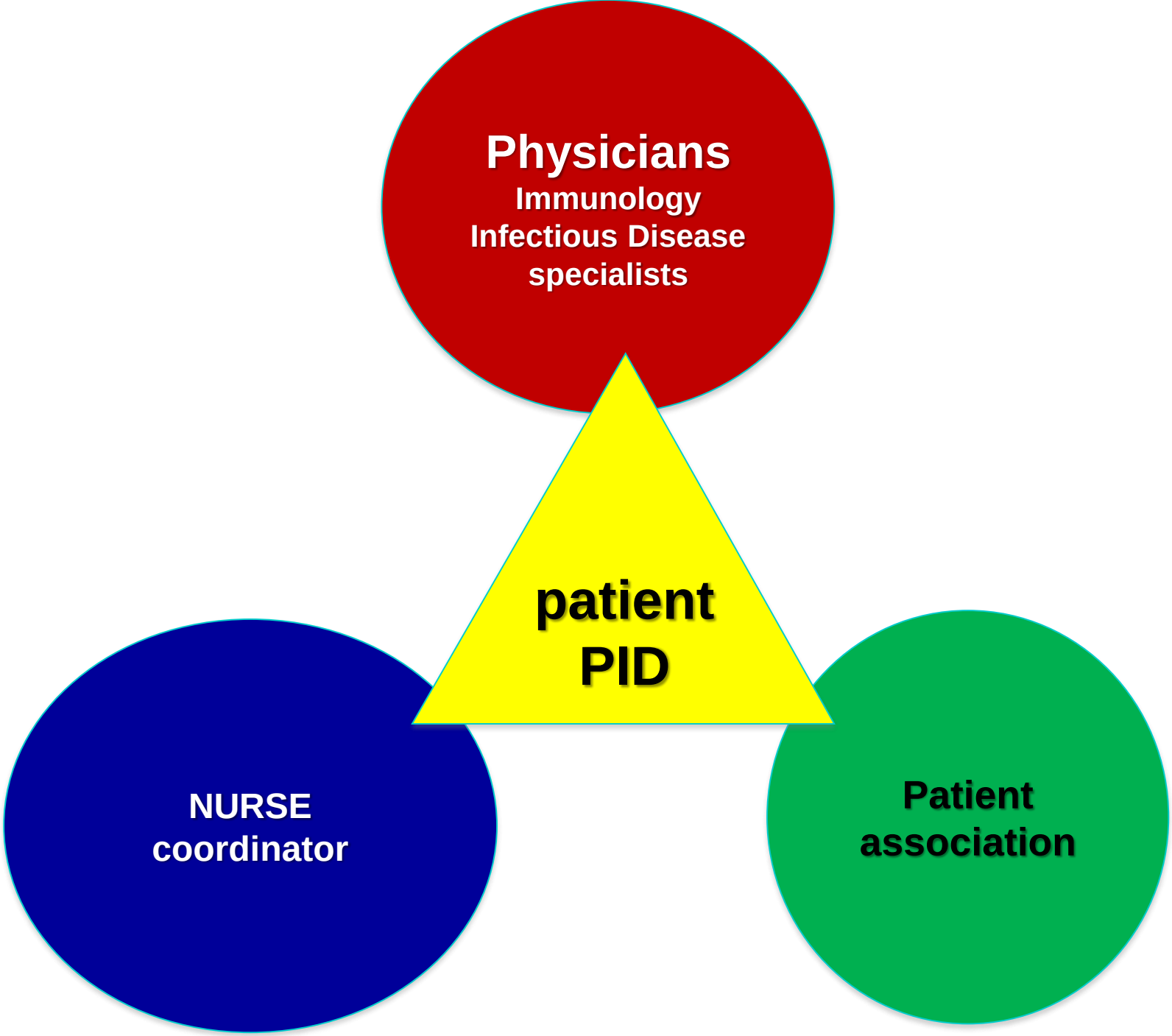
1 Bruton OC. *Pediatrics.* 1952;9:722-728.
2. C.A. Janeway, L. Apt, D. Gitlin, Agammaglobulinemia, *Trans. Assoc. Am. Physicians* 66 (1953) 200-202.
3. D. Gitlin, C.A. Janeway, Agammaglobulinemia: congenital, acquired and transient forms, *Prog. Hematol.* 1 (1956) 318 – 356.
4. L. E. Hill, P.L. Mollison, MRC working party on hypogammaglobulinemia, collection of cases and design of trial, Chap. II, Hypogammaglobulinemia in the UK, Her Majesty's Stationary Office, London 1971, pp. 4 – 8.
5. Berger M. et al. *Ann Intern Med.* 1980;98:55-56.
6. Abrahamsen TG. et al. *Pediatrics.* 1996;98:1127-1131.

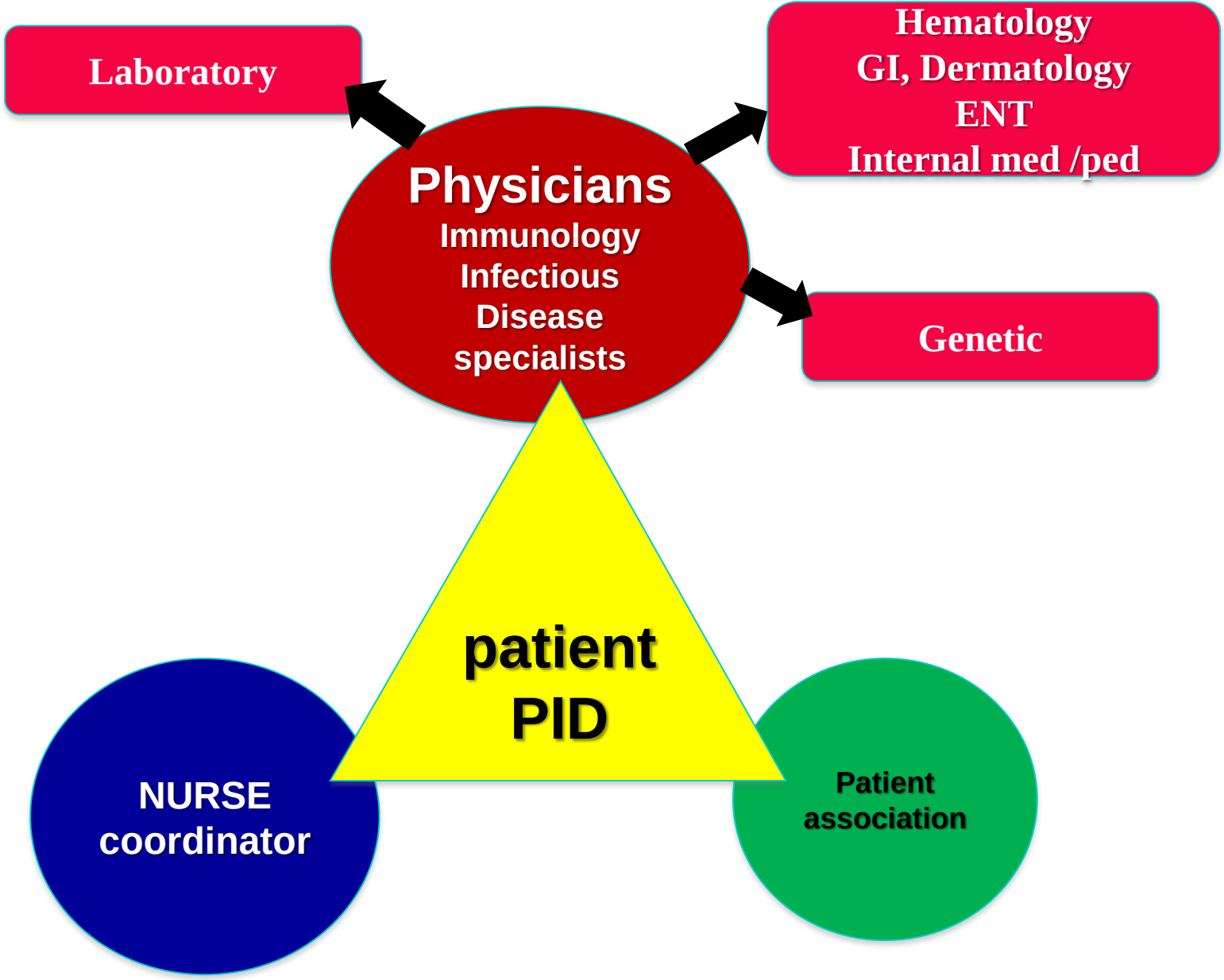
Primary immunodeficiencies

PID clinic overview

Structure of PID clinic

1- medical


Physicians
Immunology
Infectious Disease
specialists
patient
PID
NURSE
coordinator
Patient
association


Laboratory
Hematology
GI, Dermatology
ENT
Internal med /ped
Physicians
Immunology
Infectious
Disease
specialists
Genetic
patient
PID
NURSE
coordinator
Patient
association

Structure of PID clinic

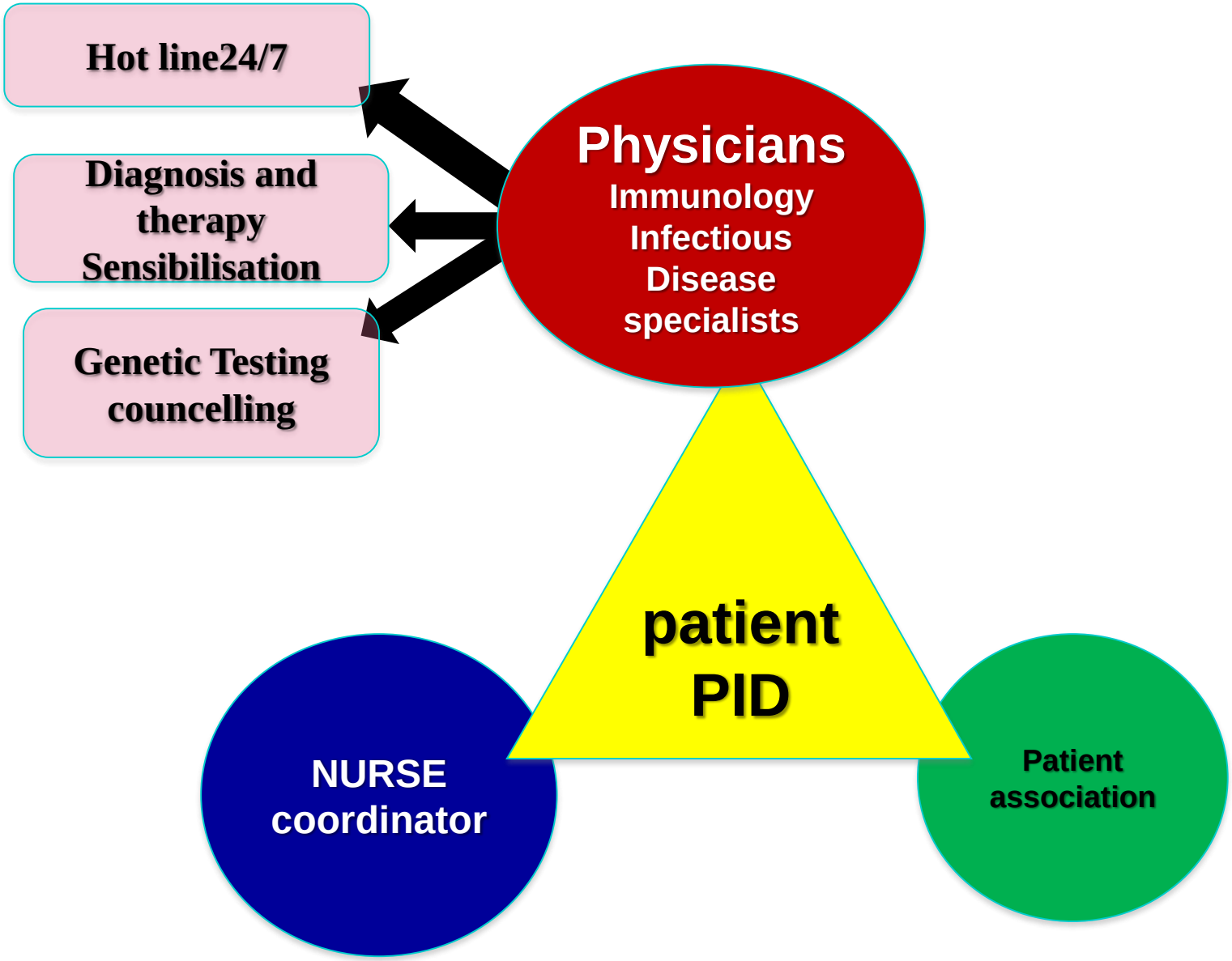
1- medical

monthly clinics by one immunologist and one infectious disease specialist (pediatric and adult)

- clinical outcome
- infections and use of antibiotics
- side effects with treatment
- any medical event since previous visit

access to ENT,GI, dermatology and hematology specialists easy

infusion clinics 2 days per week for IV infusions

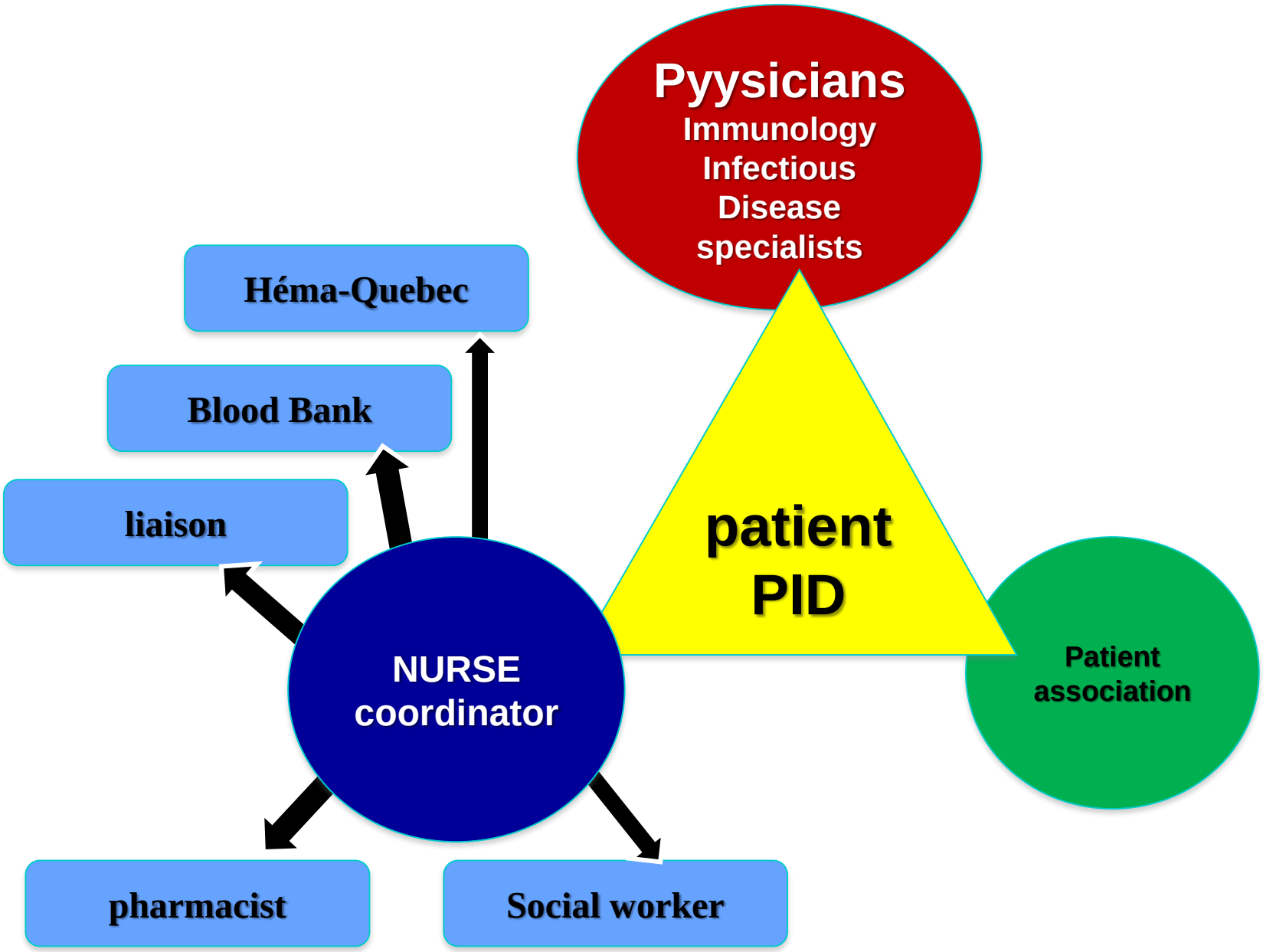

Hot line24/7
Diagnosis and therapy Sensibilisation
Genetic Testing councelling
Physicians
Immunology
Infectious
Disease
specialists
patient
PID
NURSE coordinator
Patient association

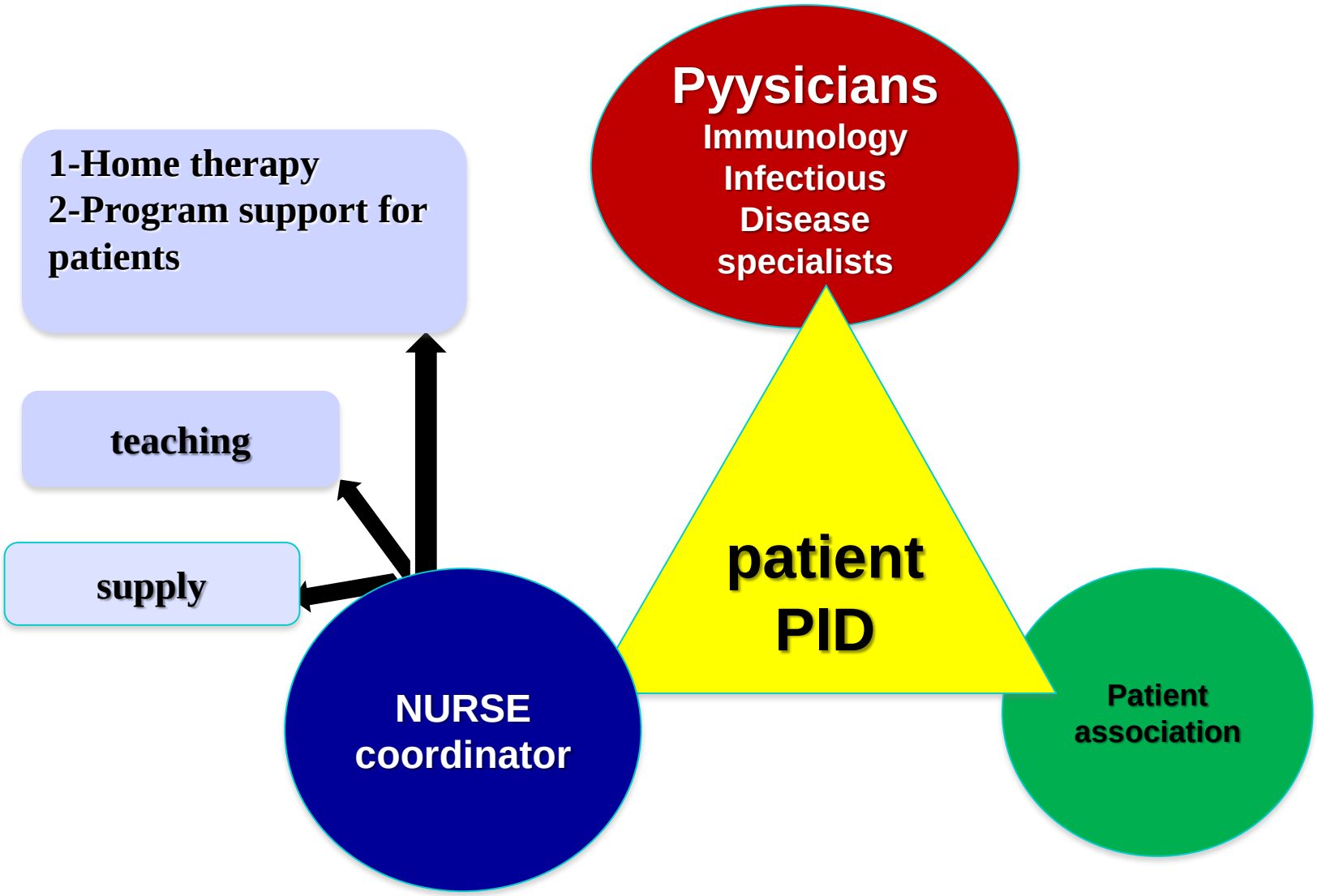
Structure of PID clinic

1- medical

2- dedicated immunology nurses (2)

- liaison nurse
- blood bank
- Héma-Quebec: chargé transfusionnel
- pharmacy


Pyysicians
Immunology
Infectious
Disease
specialists
Héma-Quebec
Blood Bank
liaison
patient
PID
NURSE
coordinator
Patient
association
pharmacist
Social worker


Pyysicians
Immunology
Infectious
Disease
specialists
1-Home therapy
2-Program support for patients
teaching
supply
patient
PID
NURSE
coordinator
Patient
association

Immunology nurse

Évaluation:

criteria for home therapy program
Socio economic bacground
Quality of life in relation to disease and treatment

Planning:

-Sessions of individual Teaching
-Supply of blood product
-Supply of tubing seringes…
-Appointments
-Liaison with CLSC

Surveillance:

- Clinical
-Technical

Immunology nurse/patient

***Teaching*:**

Patient
Staff: nurse

***Communications*:**

***Collaboration and coordination* :**

***Advocacy*:**

-

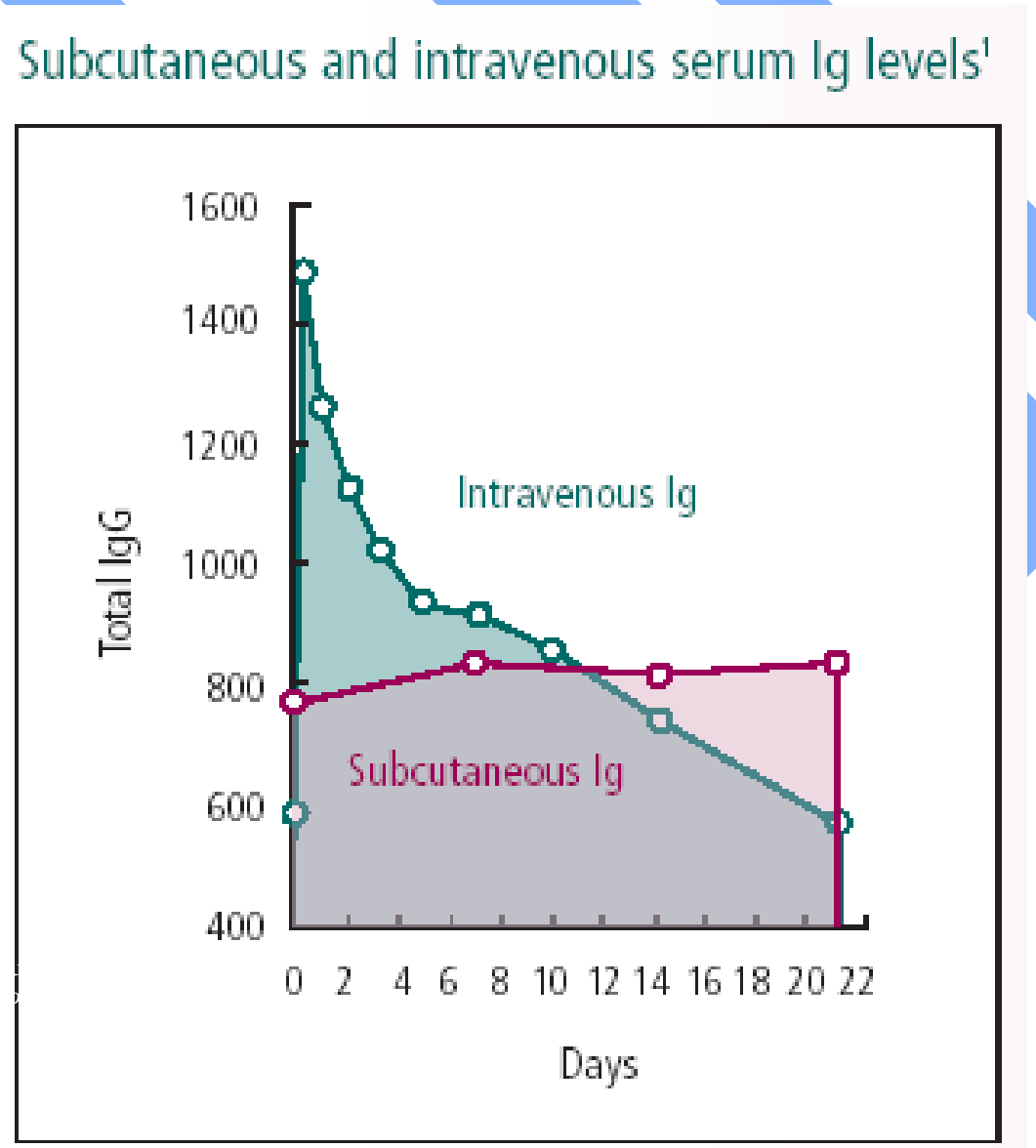
Home Therapy Program

Why choosing SC Route?
Comparison of Advantages

Subcutaneous	Intravenous
No venous access required	Convenient and well tolerated by most patients
Slow administration and gradual absorption reduces severe headaches and other adverse events	Ability to give large volumes per infusion allows intermittent dosing (every 21-28 days)
Maintains more consistent IgG levels; eliminates low troughs	

Berger M. *Clin Immunol.* 2004;112:1-7.

Weekly Dosing Results
In More Even Levels of Plasma IgG



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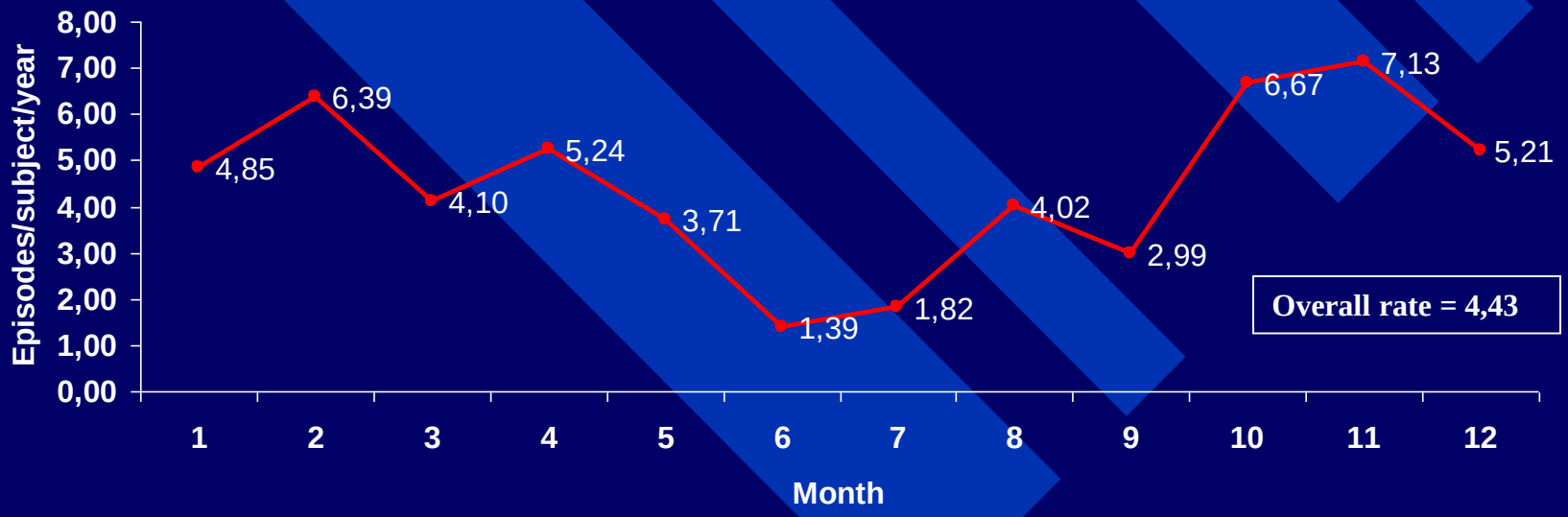
Annualized Infection Rates by Month of Onset
PPS - Efficacy Phase - any Infection-



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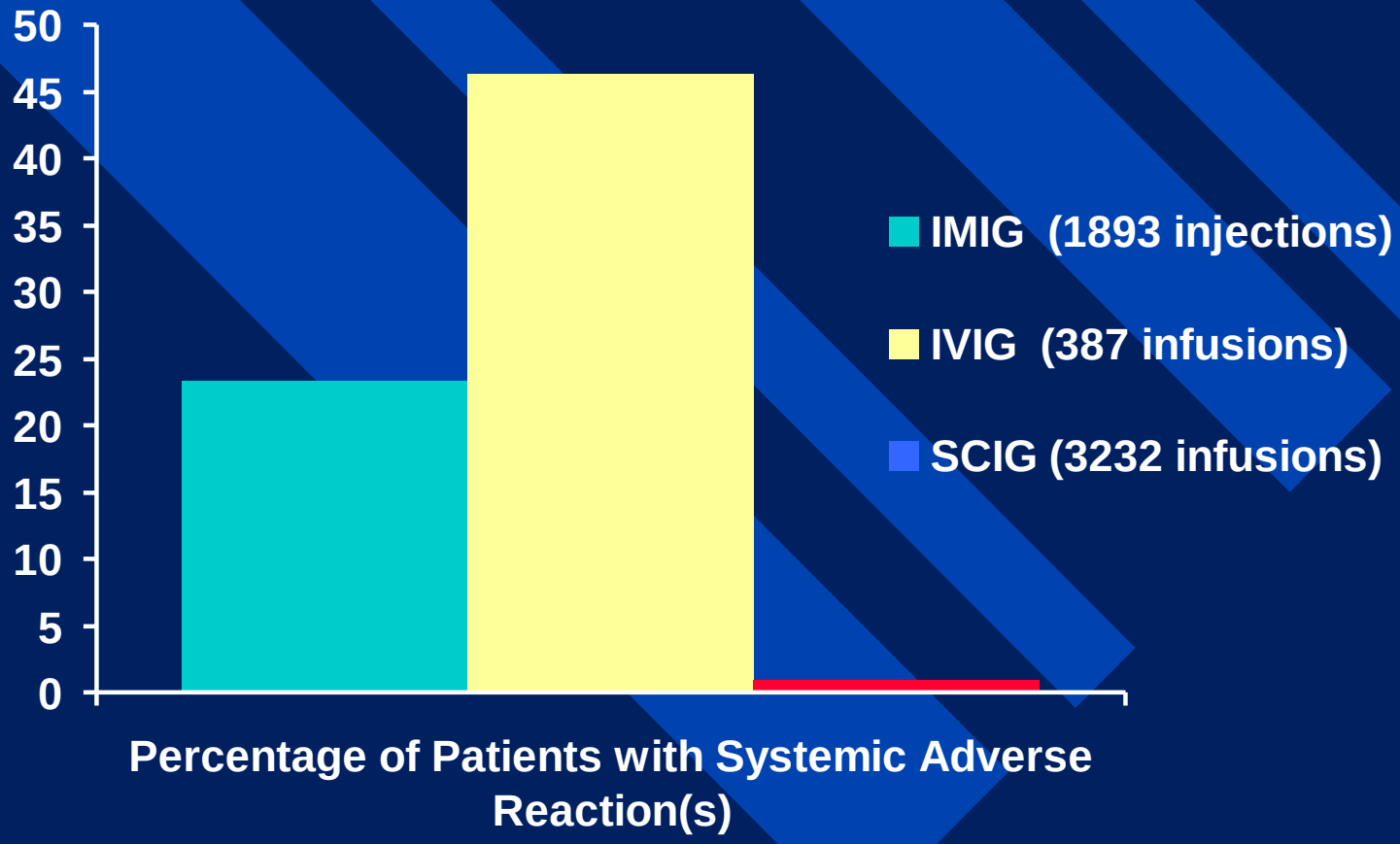
Systemic Adverse Events (During IM, IV, and SC Ig Infusions)

Based on separate studies, not a head-to-head evaluation



****P*<.001 vs SC infusion**

Gardulf A, et al. *Lancet*. 1991;338:162-166.

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Excellent safety profile	
Facilitates self or home infusion, increasing patient autonomy – may improve patient's self-image and sense of control	
Less expensive for society and patient	

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Comparaison: IV (hosp) – SC (home)

	IVIG hospital based	SCIG home based	
Garduf et al	14,124	4,636.	US$ 1993
Hogy direct and indirect	31,027	14,893	Euro 2003
Liu	18,600	11,760	Euro 2005
Haddad	14,304	18,216	Euro

Economical Impact Government perspective

CADTH report

Economy of 9 millions CDN$ / Year if 75% of patients on IVIg are switched to SCIg

Economy of 700$ / patient
(Tubing and pumps included)

Much better with the PUSH technique
no pump and minimal tubing

Ho C. Et al Overview of subcutaneous vs IV for PID: systematic Review and Economic Analysis *Canadian Agency for Drug and Technologies in Health* 2008

Home therapy program

Follow up

Supply

Teaching

planning

Directives équipe transfusionnelle

Entry criterias

Entry criterias

- **Clinical criteria**
- **Skill**
- **Socio economic background**
- **Contract**

Hema-QUÉBEC

- **Tracability**
- **Supply in remote areas**
- **Adverse events**
- **Procedure for recall**

planning

- **Appointments for teaching and supervision**
- **Supply: drug and material**
- **Medical follow-up**
- **Third party: liaison nurse**

Teaching

Étape 3: Vérifiez les flacons

Examinez attentivement à l'œil nu la solution qui se trouve dans chaque flacon de Hizentra®. La solution de Hizentra® devrait être claire et varier de jaune pâle à brun clair. Examinez la solution afin d'y déceler toute particule ou toute décoloration.

N'utilisez pas le flacon si :

- La solution est trouble ou contient des particules ou si elle a changé de couleur.
- La capsule inviolable est manquante.
- La date de péremption inscrite sur l'étiquette est périmée.

Étape 4a : Préparez et remplissez la seringue

Nettoyez le flacon

- Retirez la capsule inviolable du flacon.
- Désinfectez le bouchon de caoutchouc avec un tampon antiseptique.

Étape 4b : Préparez et remplissez la seringue

Transférez Hizentra® dans une seringue pour la perfusion

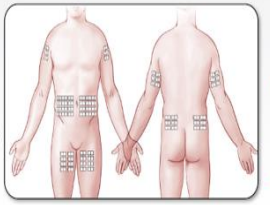
- Fixez une aiguille de transfert à l'extrémité de la seringue.
- Tirez le piston de la seringue vers l'arrière pour y introduire un volume d'air équivalant au volume de Hizentra® requis.
- Déposez le flacon de Hizentra® sur une surface plane et insérez l'aiguille au centre du bouchon de caoutchouc du flacon.
- Assurez-vous que l'extrémité de l'aiguille ne touche pas à la solution. Poussez ensuite le piston de la seringue. Cette opération injectera de l'air à partir de la seringue dans l'espace vide du flacon.
- En laissant l'aiguille dans le bouchon de caoutchouc, renversez délicatement le flacon.
- Tirez tranquillement le piston de la seringue vers l'arrière pour la remplir de Hizentra®.
- Retirez la seringue remplie ainsi que l'aiguille du bouchon de caoutchouc. Retirez l'aiguille, puis jetez-la dans le contenant pour disposer des objets pointus.

Étape 5 : Préparez la tubulure d'administration

- Préparez et remplissez la tubulure d'administration. Pour préparer la tubulure, fixez la seringue remplie de Hizentra® à la tubulure d'administration et poussez délicatement le piston de la seringue afin de remplir la tubulure de Hizentra®

Étape 6: Préparez le ou les sites d'injection

Choisissez le ou les sites d'injection :



- Sélectionnez une zone sur votre abdomen, votre cuisse, vos bras ou votre hanche latérale ou même une partie supérieure de vos jambes pour procéder à l'administration.
- Utilisez un site différent d'une perfusion à l'autre de Hizentra®. De nouveaux sites devraient être situés au moins 1 pouce plus loin que le site précédent.
- Vous ne devez jamais administrer Hizentra® dans les régions où la peau est tendre, parsemée d'ecchymoses, rouge ou dure. Évitez d'administrer Hizentra® dans des cicatrices ou des vergetures.

Étape 6 : Préparez le ou les sites d'injection (suite)

Choisissez le ou les sites d'injection :

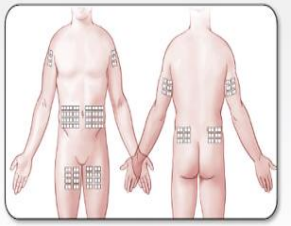
- Si vous utilisez plus d'un site d'injection, veillez à laisser une distance d'au moins 2 pouces (5 cm) entre chaque site.
- Perfuser Hizentra® dans un maximum de 4 sites simultanément.
- Désinfectez la peau au site d'injection avec un tampon antiseptique. Laissez la peau sécher.

Étape 7 : Insérer l'aiguille

- Avec deux doigts, pincer la peau autour du site d'injection. Insérez l'aiguille sous la peau.
- Recouvrez le site d'injection d'un pansement chirurgical transparent ou d'une gaze stérile fixée au moyen de ruban adhésif. L'aiguille ainsi fixée ne pourra pas se dégager.

Étape 8 : Administrez Hizentra®

- Commencez la perfusion.
- Si la perfusion se fait à l'aide d'une pompe à perfusion, observez les directives du fabricant.
- Une fois la perfusion terminée, enlevez le pansement chirurgical transparent ou la gaze et retirez l'aiguille du site d'injection.



Étape 9 : Inscrivez la perfusion

- Inscrivez le numéro de lot provenant de chaque flacon (et tout autre renseignement, s'il y a lieu) dans le registre ou le calendrier des traitements. L'étiquette détachable trouvée sur le flacon de Hizentra® peut être apposée dans le registre ou le calendrier des traitements du patient.
- Scanner le flacon si l'enregistrement de la perfusion se fait par voie électronique.

Methods of administration

PUMP Method: an ambulatory infusion pump or syringe driver is used to infuse the dose as described in the product monograph

- **Frequency: Weekly dose**
- **Weekly Dose: ≈ ¼ monthly IVIg dose**
- **Patient can be ambulatory during administration**

PUSH Method: pushing the product using small doses regularly has been used in some US and Canadian centres

- **Frequency: every day, every 2-3 days, 5 days/wk, etc**
- **Daily Dose: weekly dose divided in vial sizes or number of treatment days required**

- ***Input from patients should be considered when choosing a regimen***
- ***Once patient has learned how to self-administer, nursing services may not be needed***

smiths
smiths

smiths

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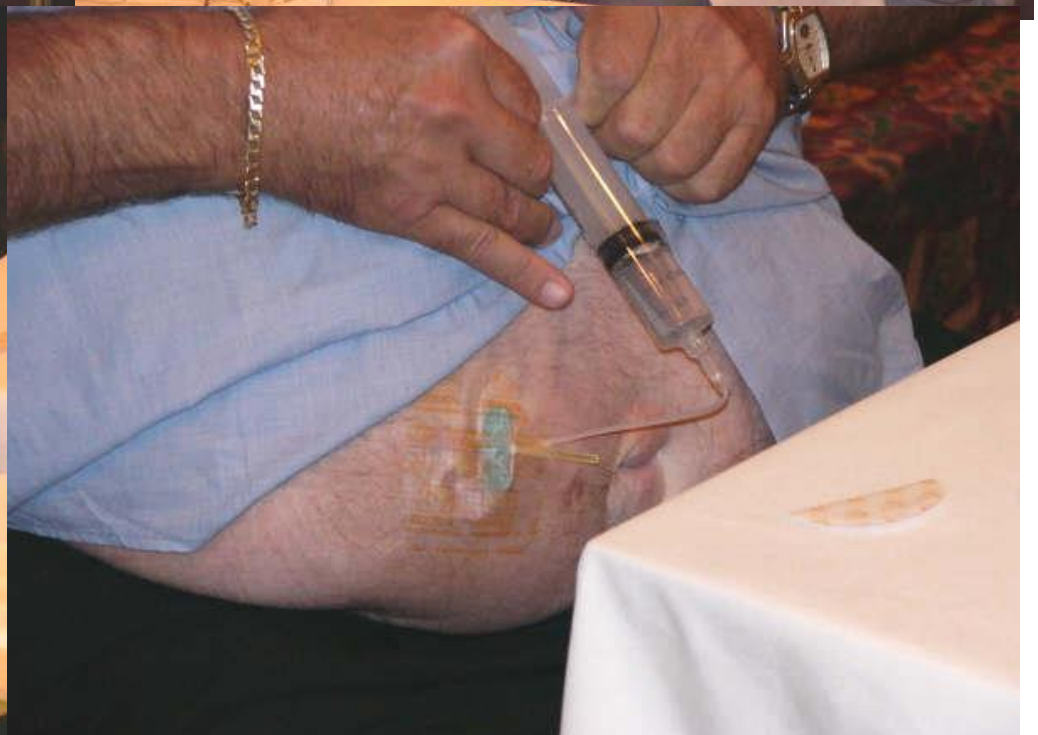


Why choosing the PUSH method?

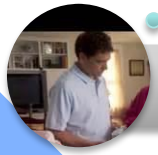
- **From an Health Authority point of view: significantly less expensive, especially when they will have to assume the cost related to pumps**

- **From the patient point of view:**
  - **No dependence to pumps**
  - **No worry about reliability of pumps**
  - **Simpler, faster**

Home therapy program

Follow up

Supply

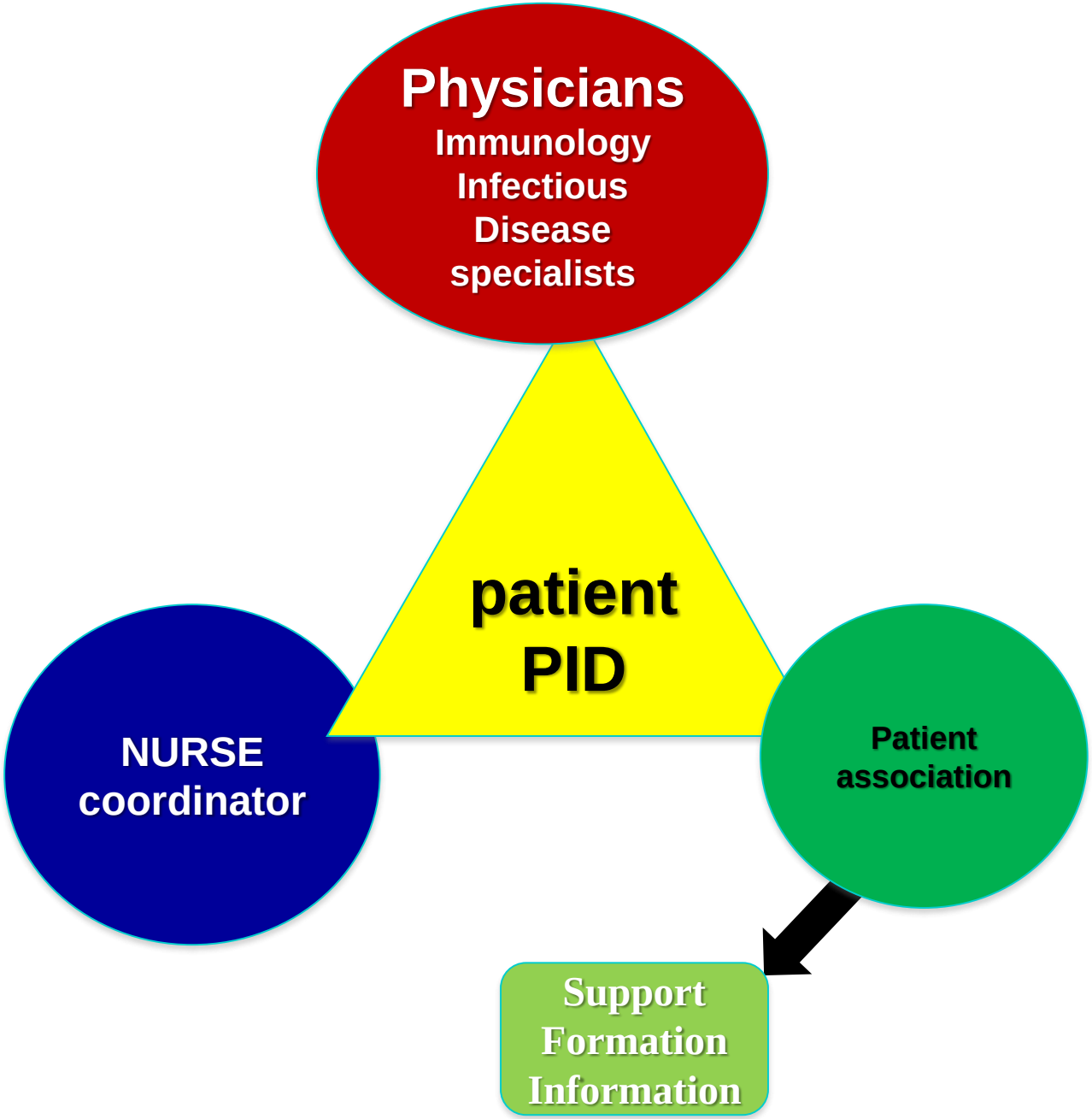


Teaching

planning

Directives équipe transfusionnelle

Entry criterias


Physicians
Immunology
Infectious
Disease
specialists
patient
PID
NURSE
coordinator
Patient
association
Support
Formation
Information

Summary

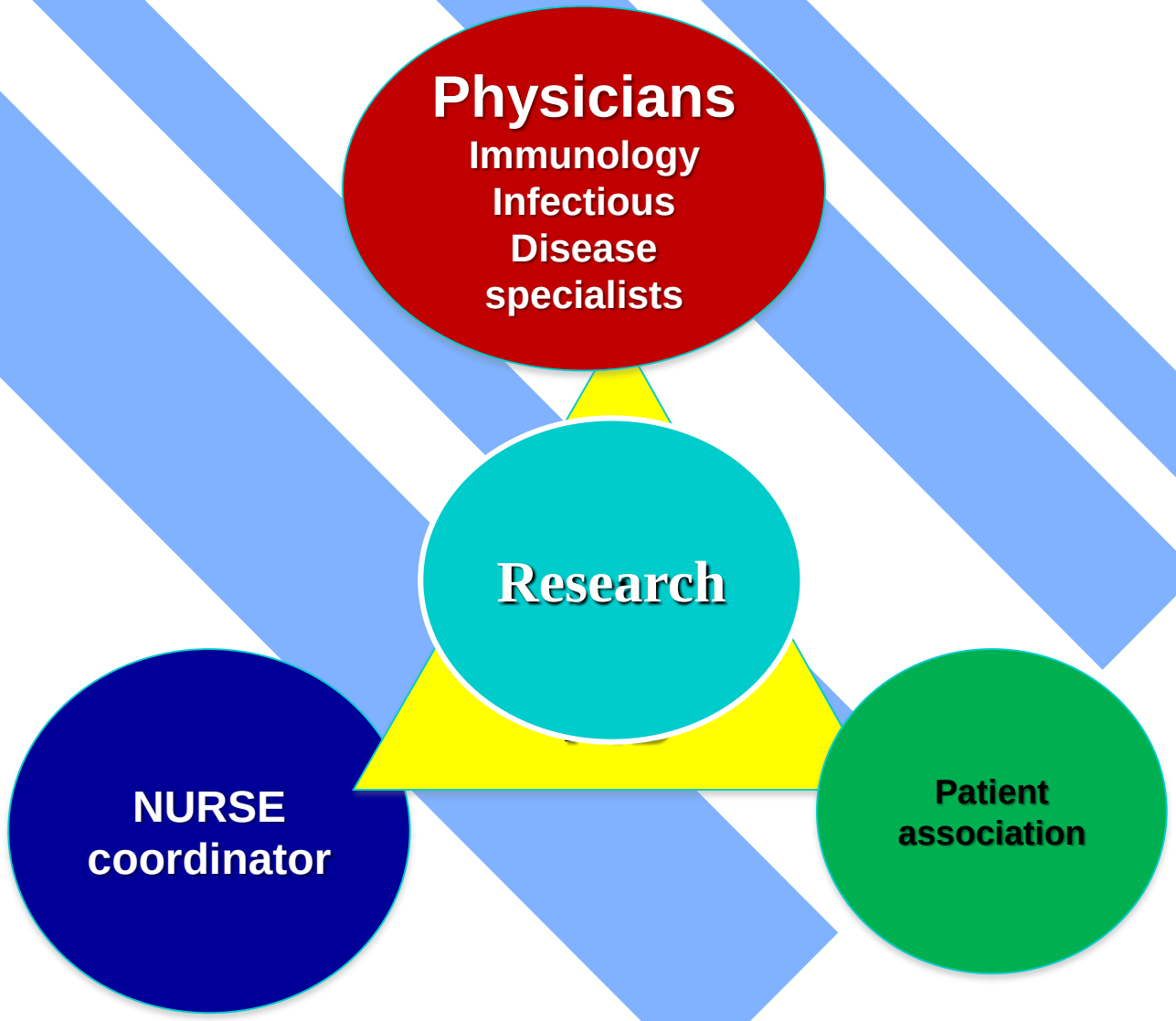
Structure of PID clinic

1- medical

2- dedicated immunology nurses (2)

- liaison nurse
- blood bank
- Héma-Quebec: chargé transfusionnel
- pharmacy

3- patient organisation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liaison nurse

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Vision

top quality of cares/ personnalized approach

quality of life of patients

Thank you