Impact des troubles de la nutrition et de la déglutition dans les infections

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Présentation de l'UTNc

- Unité Transversale de Nutrition clinique
- Hôpital DUPUYTREN (Draveil), groupe hospitalier Henri MONDOR

- Créée en 2008
- Selon le PNNS 2006, sur appel à projet de la DHOS en 2006
- 7 UTNc au plan national à la création, environ 57 en 2016
- Seule UTNc gériatrique en 2008, ? en 2016

- Activité de consultations, d'HDJ, de formations aux professionnels, de prise en charge nutritionnelle des patients hospitalisés, de vigilance nutritionnelle au sein de l'hôpital…

- 2 diététiciennes, 1 secrétaire, 1 médecin

La dénutrition

Fréquente :

4 à 10 % à domicile

15 à 40 % en institution (maisons de retraites…)

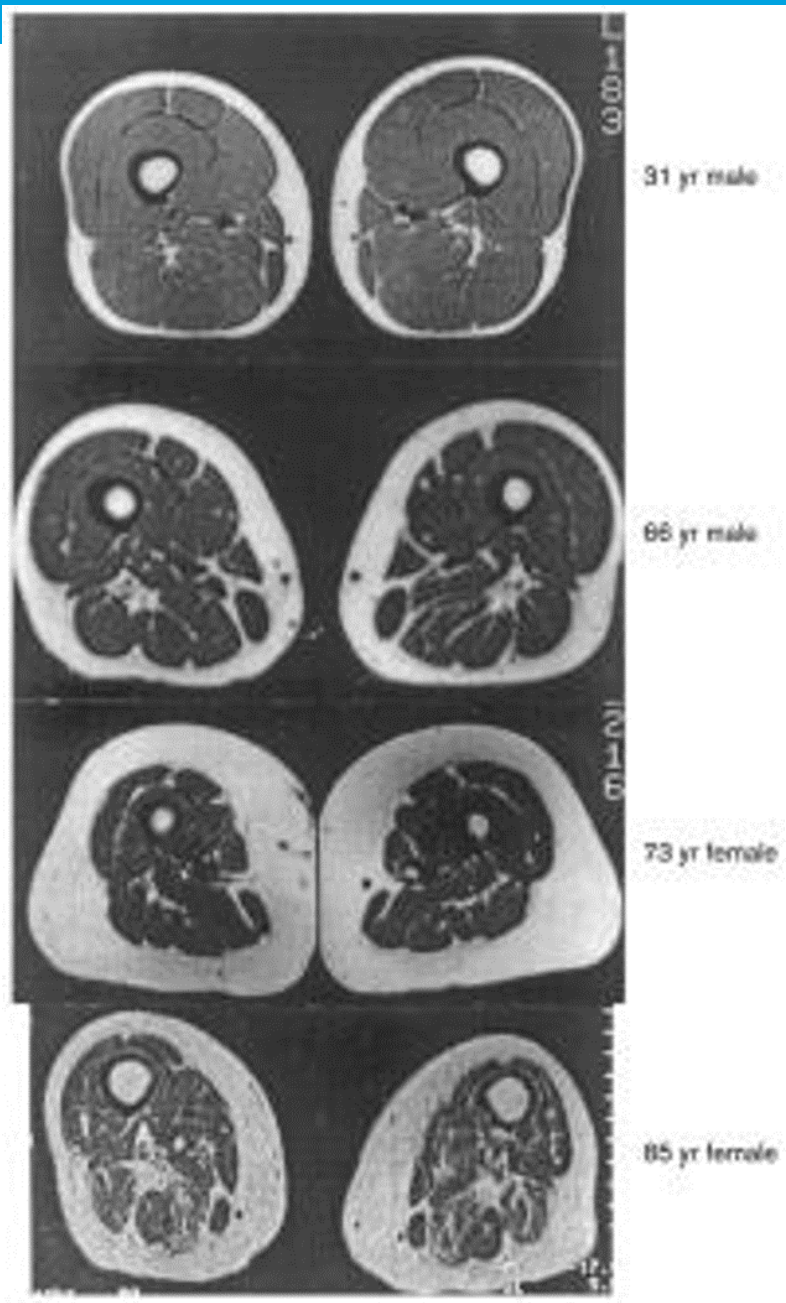
30 à 70 % à l'hôpital

Fréquente :

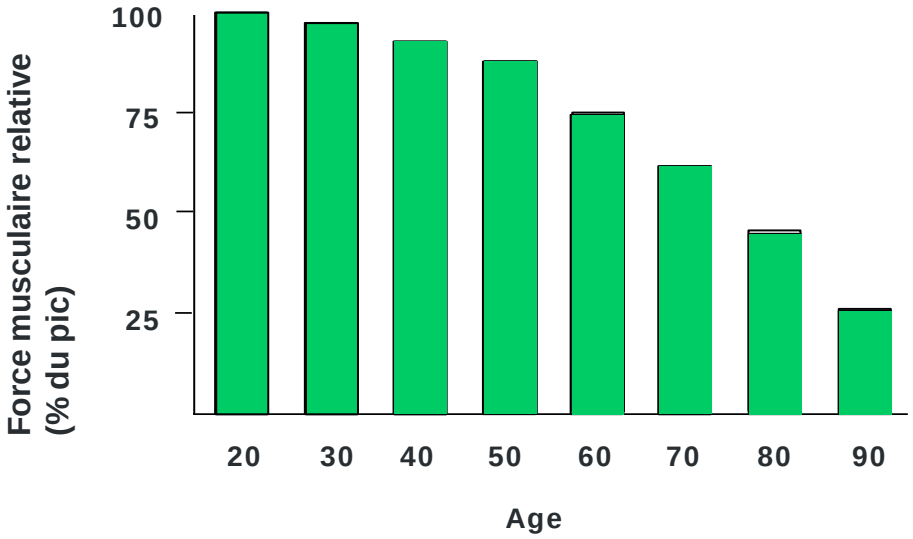
Population (n=)	% dénutris	Référence
Chirurgie (131)	54	Bistrian et al.1974
Médecine (201)	45	Bistrian et al.1976
Chirurgie (105)	12-55	Hill et al.1977
Médecine (134)	46	Weinsier et al.1979
Hôpital général (200)	31.5	Willard et al.1980
Orthopédie (82)	48	Dreblow et al.1981
Hémodialyse (58)	62	Thunberg et al.1981
Chirurgie (90)	30-40	Perrot et al.1982
Gériatrie (59)	61	Bienia et al.1982
Pédiatrie (515)	30	Girardet et al.1989
Gériatrie (324)	41	Constans et al.1992
Gériatrie (40)	46	Alix et al.1992

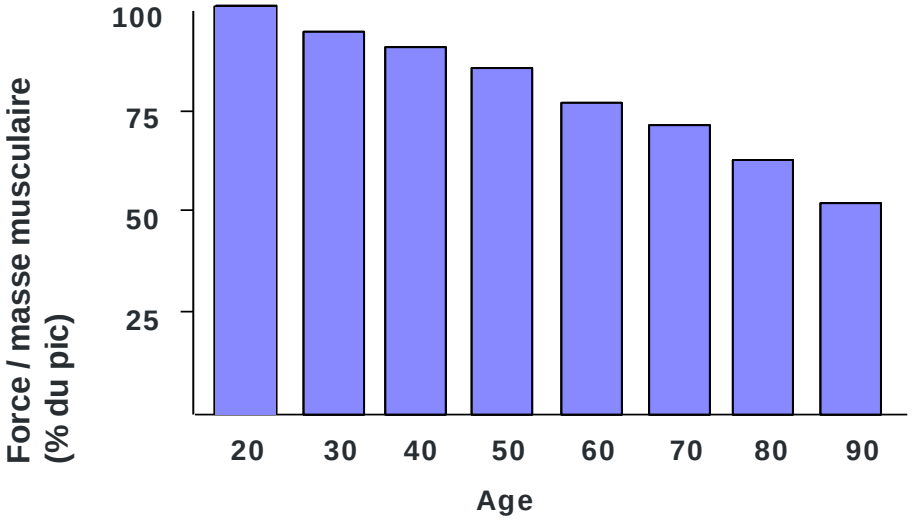
La sarcopénie

- La dénutrition provoque une diminution de la masse musculaire (sarcopénie)



- La dénutrition provoque une diminution de la force musculaire

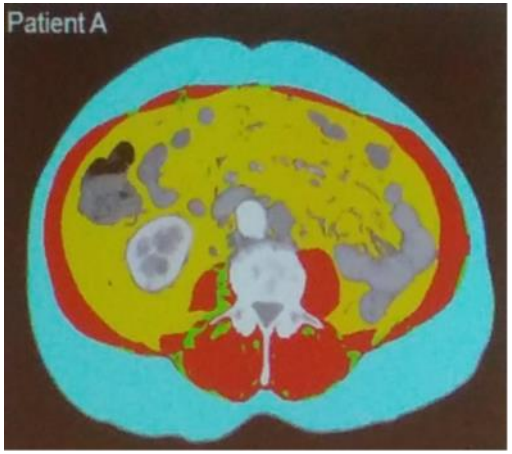




- Gros…
- Maigre…
- Ou IMC identique …
  … et composition corporelle différente …

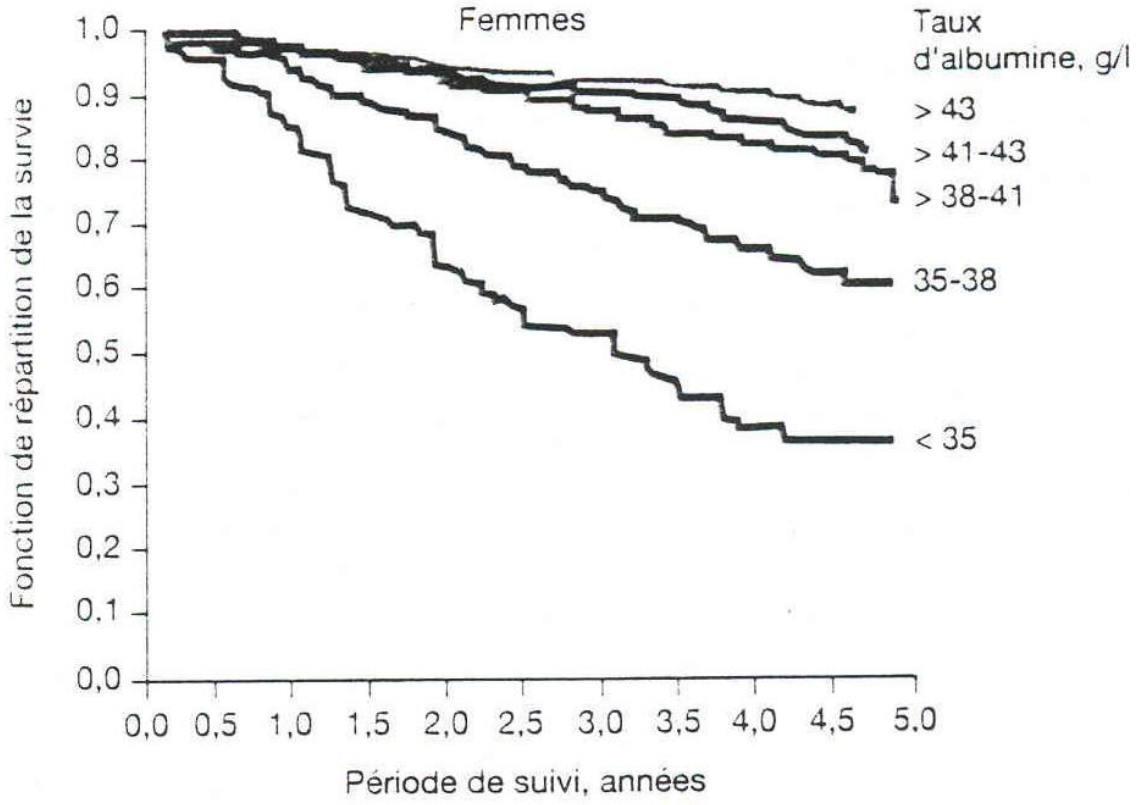
IMC identique, surface corporelle identique,

...mais composition corporelle différente...



	IMC	Surface Corporelle	Surface muscle	Surface tissu adipeux viscéral	Surface tissu adipeux sous-cutané	Densité
Patient A	25,5	1,8	131	208	225	36
Patient B	25,9	1,9	190	76	80	47,1

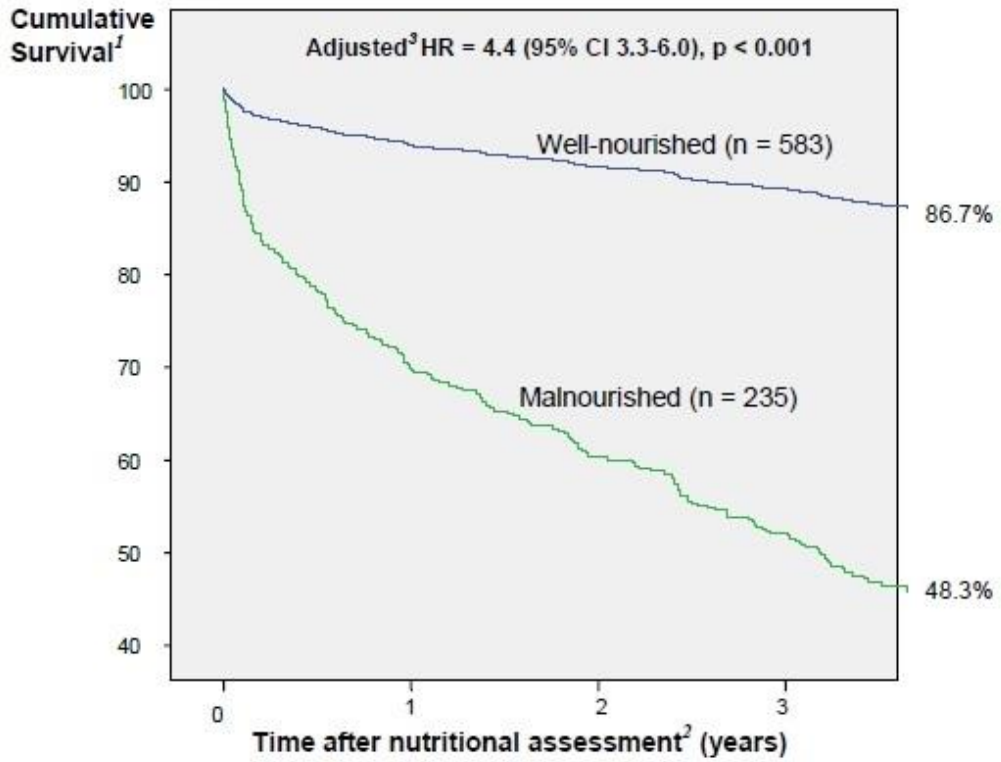
Augmentation de la mortalité



Augmentation de la mortalité

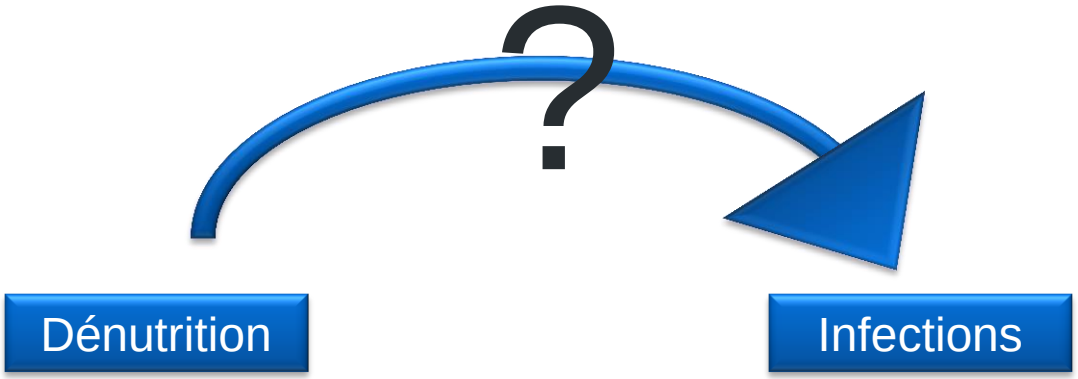
SL Lim, KCB Ong, YH Chan, WC Loke, M Ferguson, L Daniels

Figure 2. Cumulative survival in well-nourished and malnourished patients (n= 818). HR = Hazard ratio.

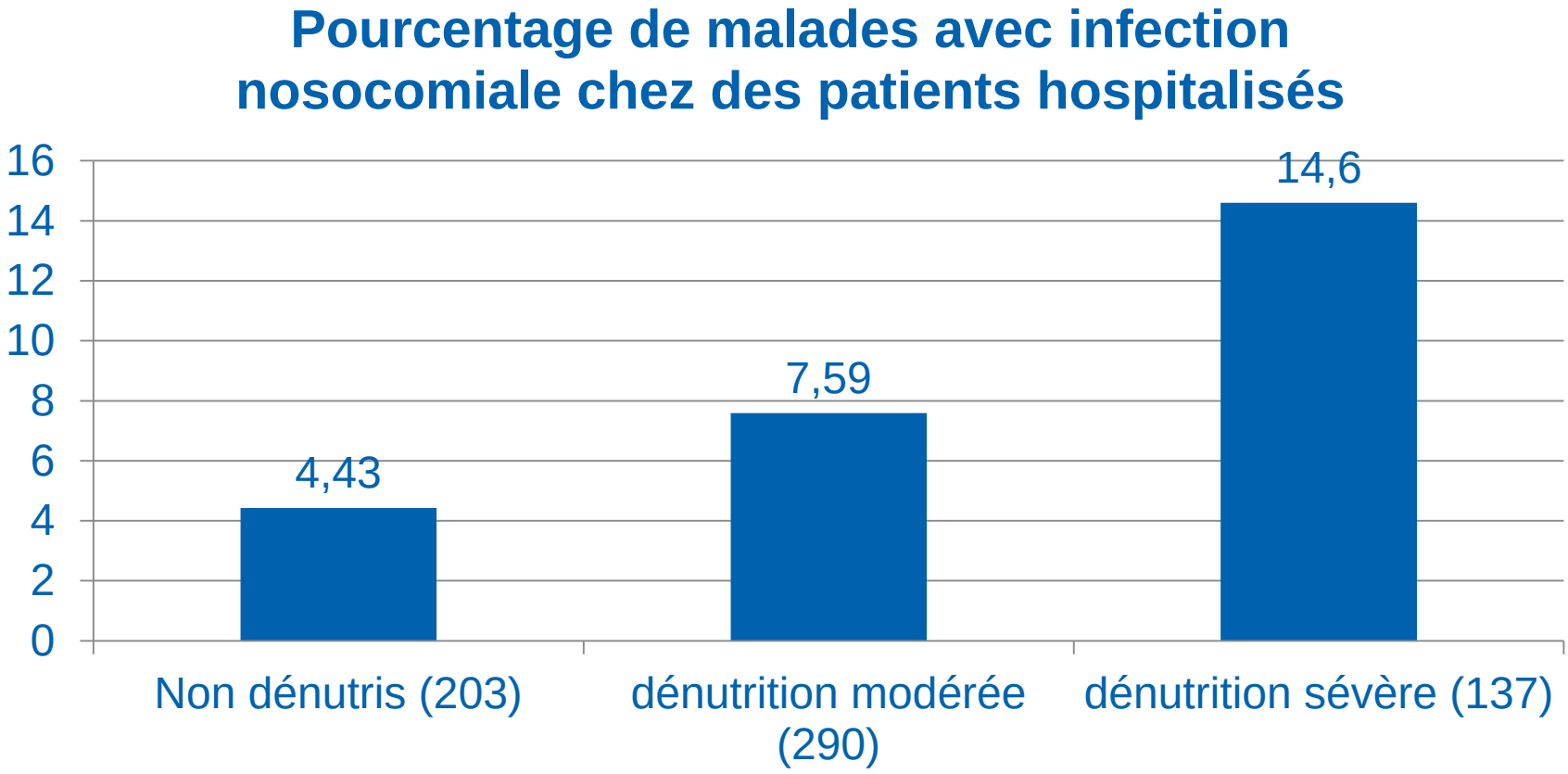


[1]Survival and mortality data from Singapore Death Registry.
[2]Assessment with Subjective Global Assessment within 48 hours of hospital admission.
[3]Adjusted for ethnicity, age and gender.

Infections et dénutrition



Infections nosocomiales et dénutrition



Schneider S.M. et coll., " Malnutrition is an independent factor associated with nosocomial infections ", British Journal of Nutrition, 92 : 105-111, 2004

Influence de la dénutrition sur les complications

Clinical Nutrition (2003) **22(3)**: 235–239
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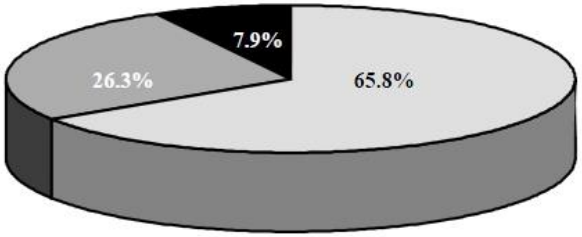
doi:10.1016/S0261-5614(02)00215-7

The impact of malnutrition on morbidity, mortality, length of hospital stay and costs evaluated through a multivariate model analysis

M. ISABEL T. D. CORREIA,* DAN L. WAITZBERG†



- Well nourished
- Moderately or suspected malnourished
- Severely malnourished

Fig. 1 Nutritional status at hospital admission, 709 patients.

Table 1 Nutritional status vs incidence of complications

Nutritional status	Complications	Without complications
Well nourished	78 (16.8%)	385 (83.2%)
Malnourished (moderately and severely)	64 (27.0%)*	173 (73.0%)
Only the severely malnourished	24 (42.8%)†	32 (57.2%)

* RR = 1.60 (IC = 1.20–2.14; $P < 0.01$).
† RR = 2.54 (IC = 1.77–3.66; $P < 0.01$).

Influence de la dénutrition sur les complications infectieuses

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Table 2 Incidence of infectious complications vs the nutritional status

Infectious complications	Well nourished	Malnourished (moderately and severely)
Pulmonary infection	19** (4.1%)	17** (5.9%)
Urinary infection	9** (1.9%)	9** (3.7%)
Wound infection	10** (2.1%)	4** (1.7%)
Sepsis	5* (1.1%)	9* (3.7%)
Intrabdominal abscess	2* (0.4%)	5* (2.1%)
Extraperitoneal abscess	1** (0.2%)	2** (0.8%)
Septic coagulopathy	1** (0.2%)	1** (0.4%)
Total	47* (10.1%)	47* (19.4%)

* $P<0.01$; ** NS.

Influence de la dénutrition sur les complications infectieuses

Age and Ageing 2005; **34:** 619–625
doi:10.1093/ageing/afi197

Relations between undernutrition and nosocomial infections in elderly patients

Elena Paillaud[1], Stephane Herbaud[1], Philippe Caillet[1], Jean-Louis Lejonc[1], Bernard Campillo[1], Phuong-Nhi Bories[2]

Table 3. Anthropometric variables and energy intake in the three groups of patients

	No infection	One infection	>One infection	
n	116	38	31	*P*
Weight (kg)	61.2 ± 1.5	58.9 ± 3.1	51.3 ± 1.7	0.0079
BMI (kg/m^2)	23.8 ± 0.5	24.0 ± 1.2	21.2 ± 0.7	0.046
MAC (cm)	27.1 ± 0.4	26.7 ± 1.0	24.1 ± 0.7	0.011
TST (mm)	11.6 ± 0.5	12.9 ± 1.3	9.5 ± 0.8	0.064
BST (mm)	4.9 ± 0.3	5.9 ± 0.9	3.1 ± 0.3	0.011
Energy intake (kcal/day)	1717 ± 40	1474 ± 91	1284 ± 74	<0.0001
Energy intake (kcal/kg/day)	29.3 ± 0.8	27.2 ± 2.1	25.1 ± 1.4	0.089

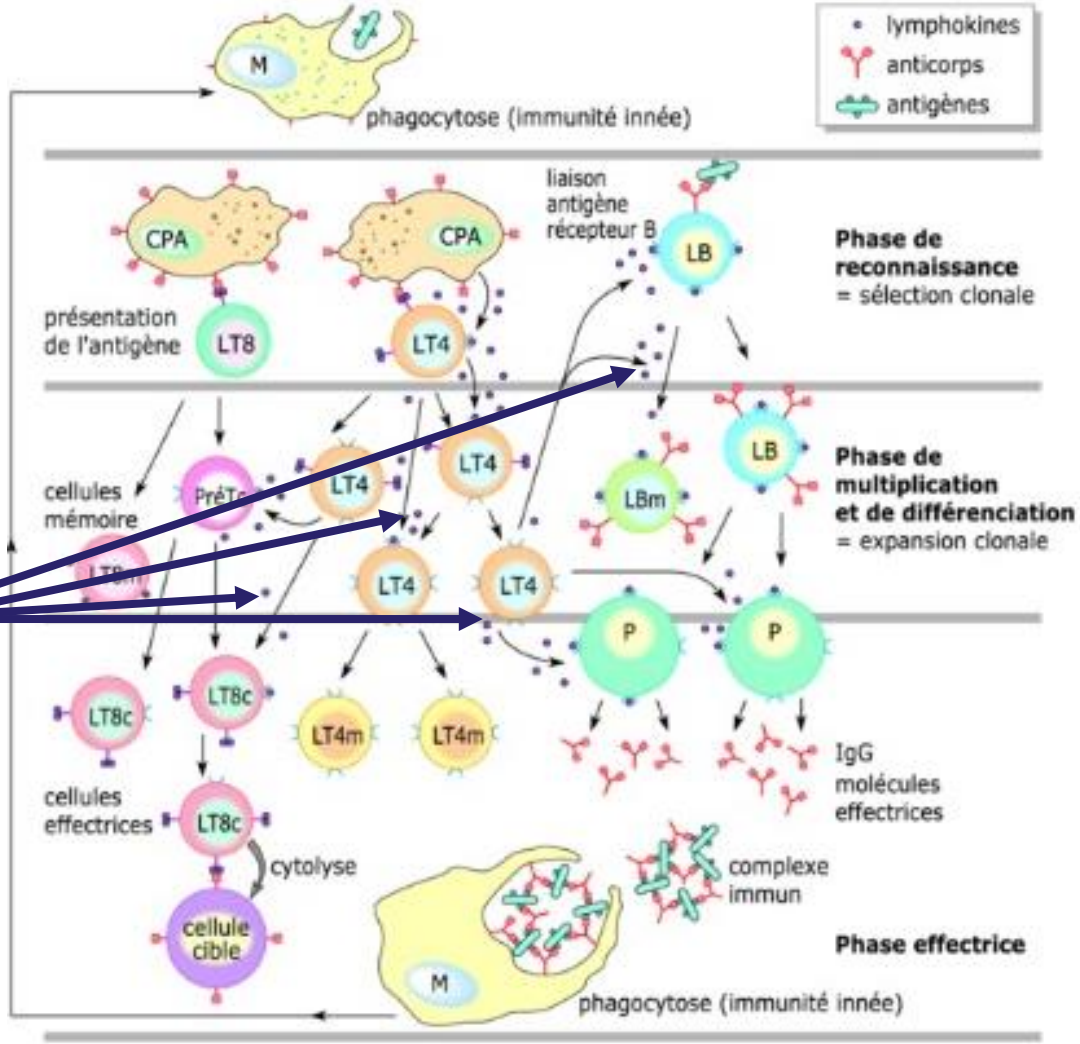
BMI, body mass index; MAC, mid-arm circumference; TST, tricipital skinfold thickness; BST, bicipital skinfold thickness.
The three groups were compared by ANOVA.

Table 4. Biological variables in the three groups of patients

	No infection	One infection	>One infection	
n	116	38	31	*P*
Albumin (g/l)	36.3 ± 0.4	34.6 ± 0.6	31.7 ± 0.9	<0.0001
Transthyretin (g/l)	0.26 ± 0.01	0.23 ± 0.01	0.19 ± 0.01	<0.0001
Orosomucoid (g/l)	2.1 ± 0.7	1.5 ± 0.1	1.6 ± 0.1	0.861
CRP (mg/l)	16 ± 2	37 ± 10	44 ± 8	0.0003
Lymphocytes (g/l)	1.7 ± 0.1	1.8 ± 0.3	1.5 ± 0.1	0.438
PMN leukocytes (g/l)	4.4 ± 0.2	6.1 ± 1.0	6.7 ± 0.7	0.0027

Le système immunitaire

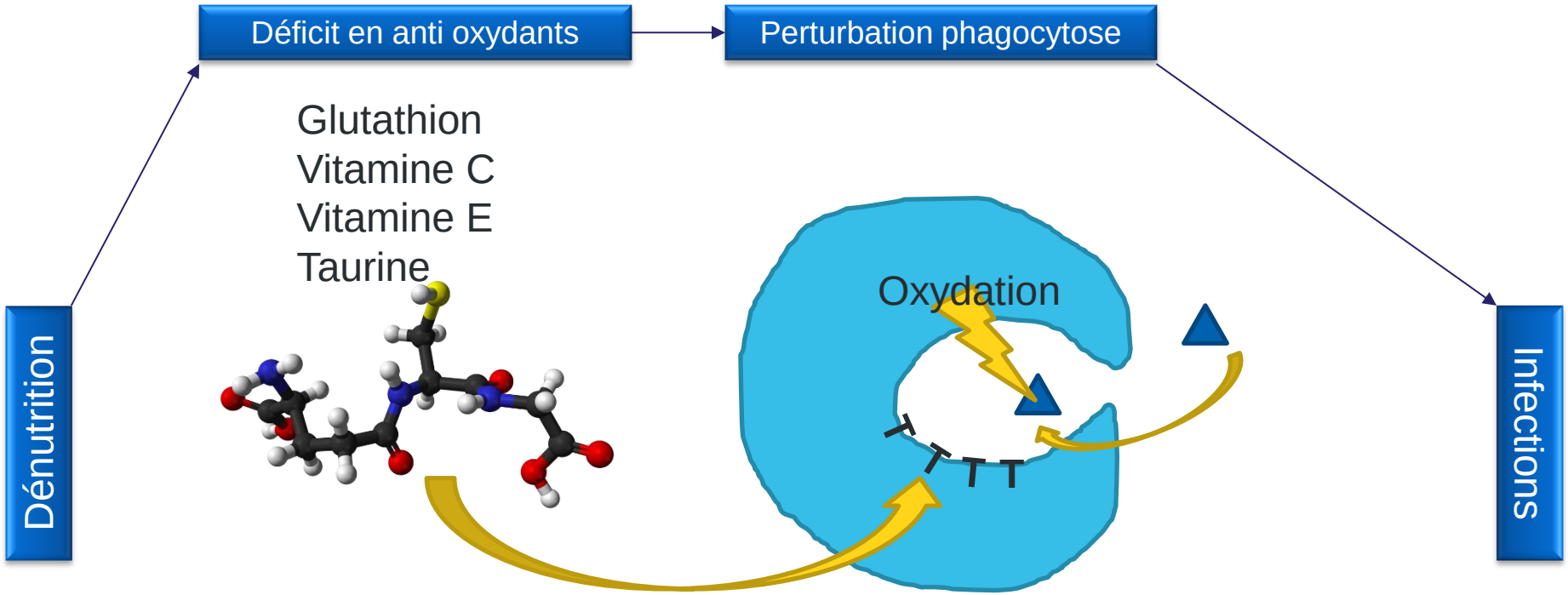
Interleukines



CPA : cellule présentatrice d'antigène
LB : lymphocyte B
LT8 : lymphocyte T CD8
LT4 : lymphocyte T CD4
P : plasmocyte

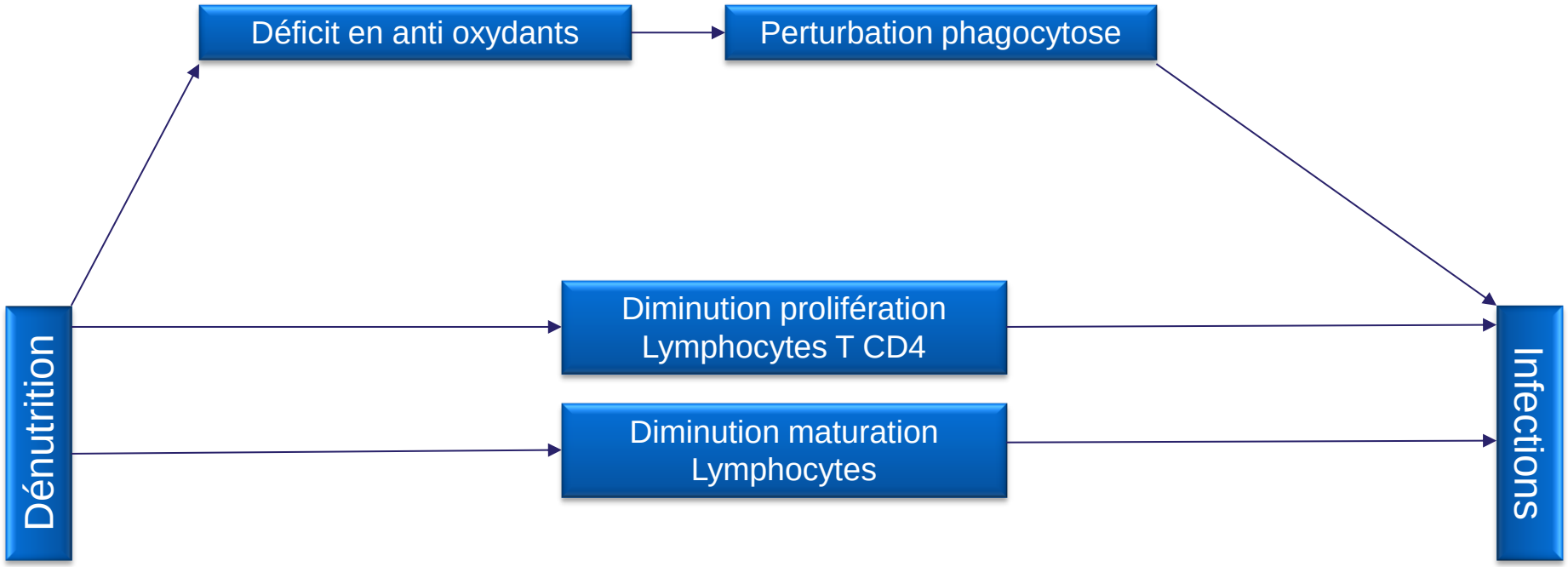
PréTc : lymphocyte T précytotoxique
LTPC : lymphocyte T cytotoxique
m : mémoire
IgC : anticorps
M : macrophage

La dénutrition perturbe le système immunitaire



Alimentation dépourvue en taurine
chez le chat: aucune phagocytose,
aucune explosion oxydative

La dénutrition perturbe le système immunitaire



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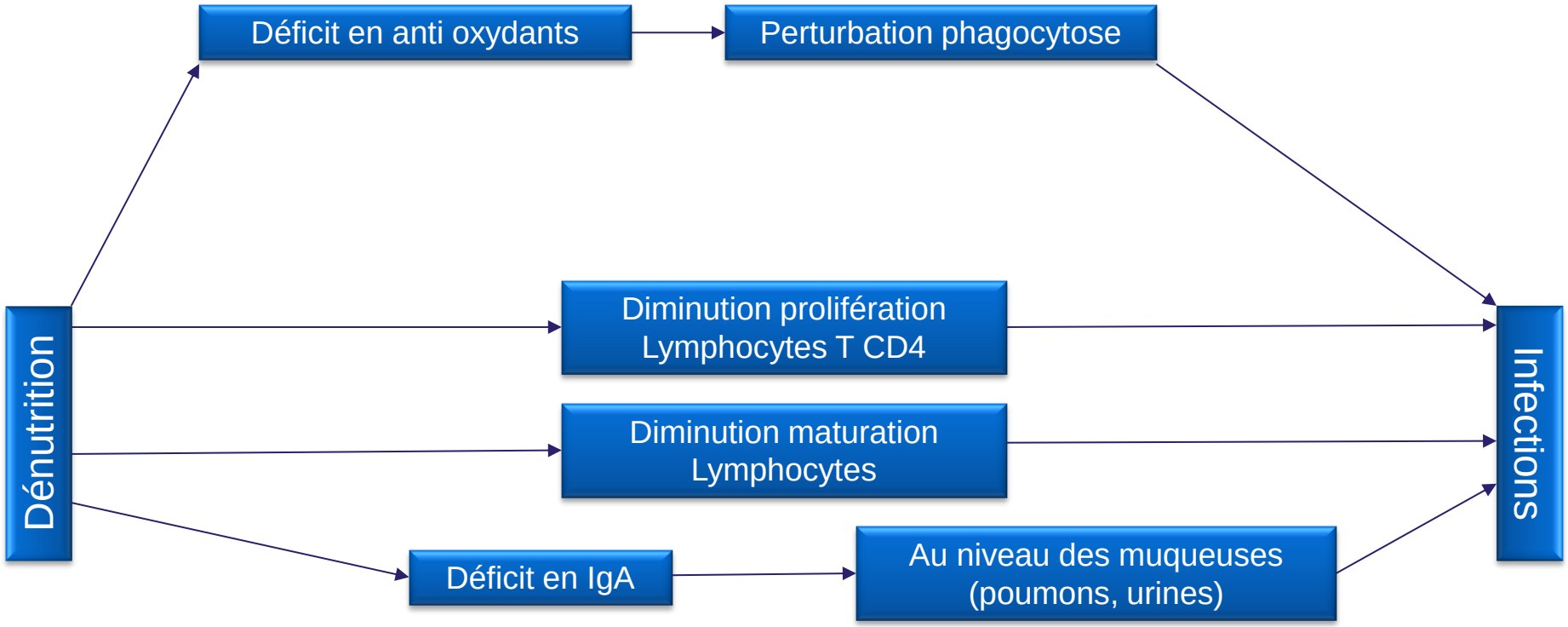
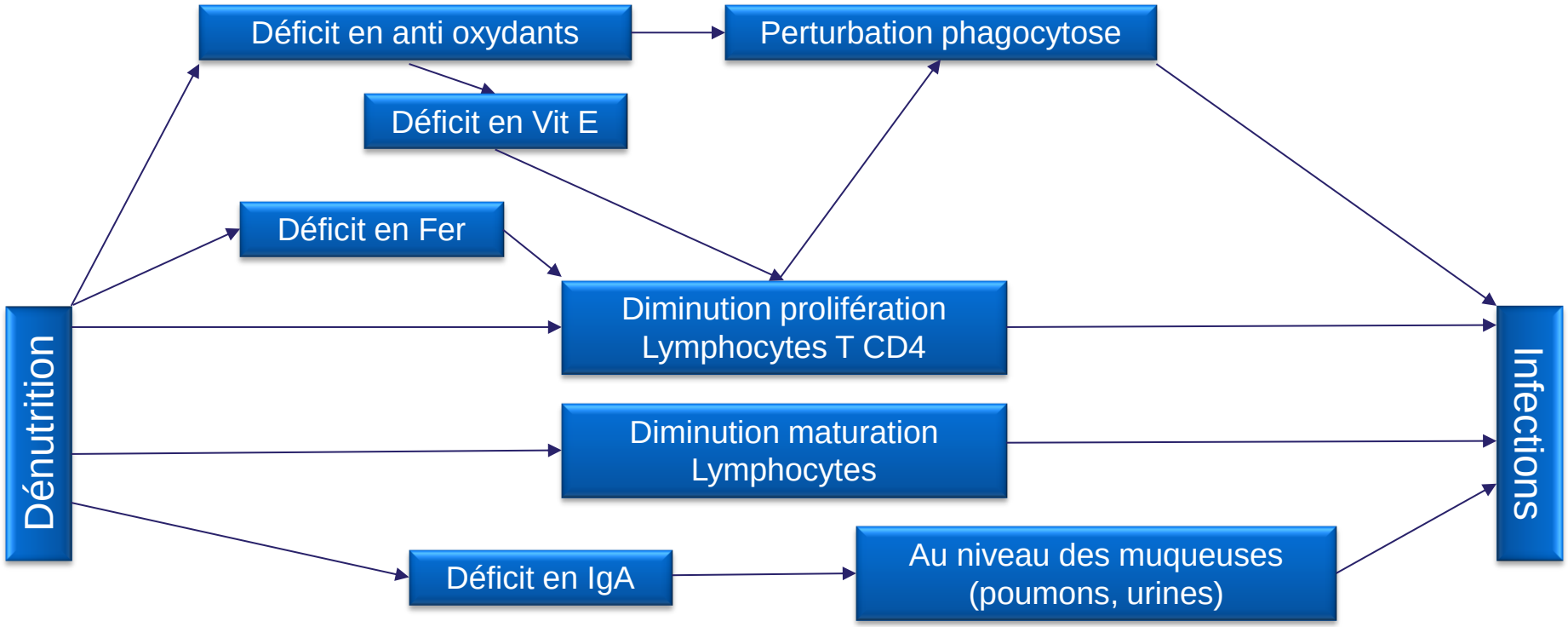
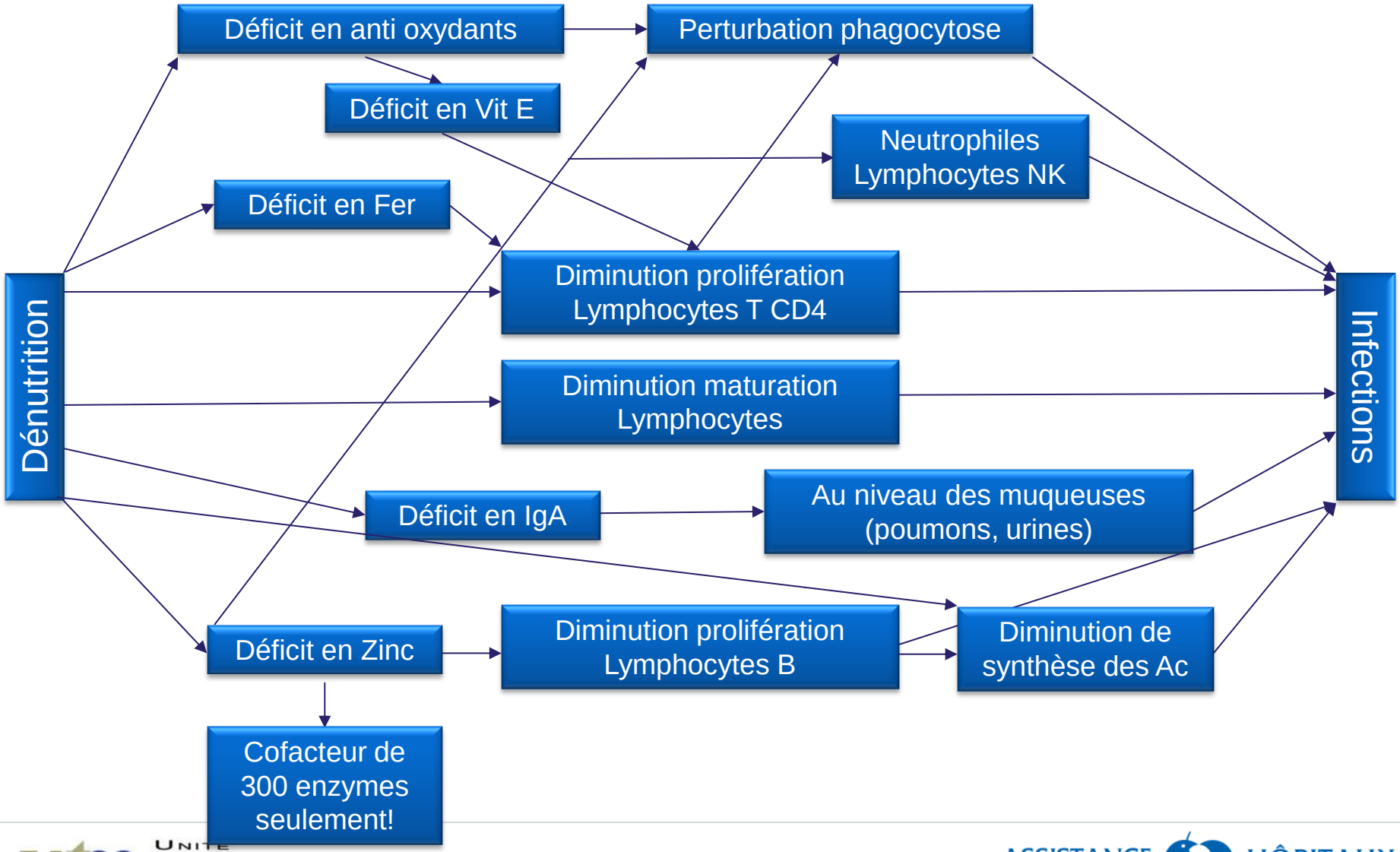


La dénutrition perturbe le système immunitaire



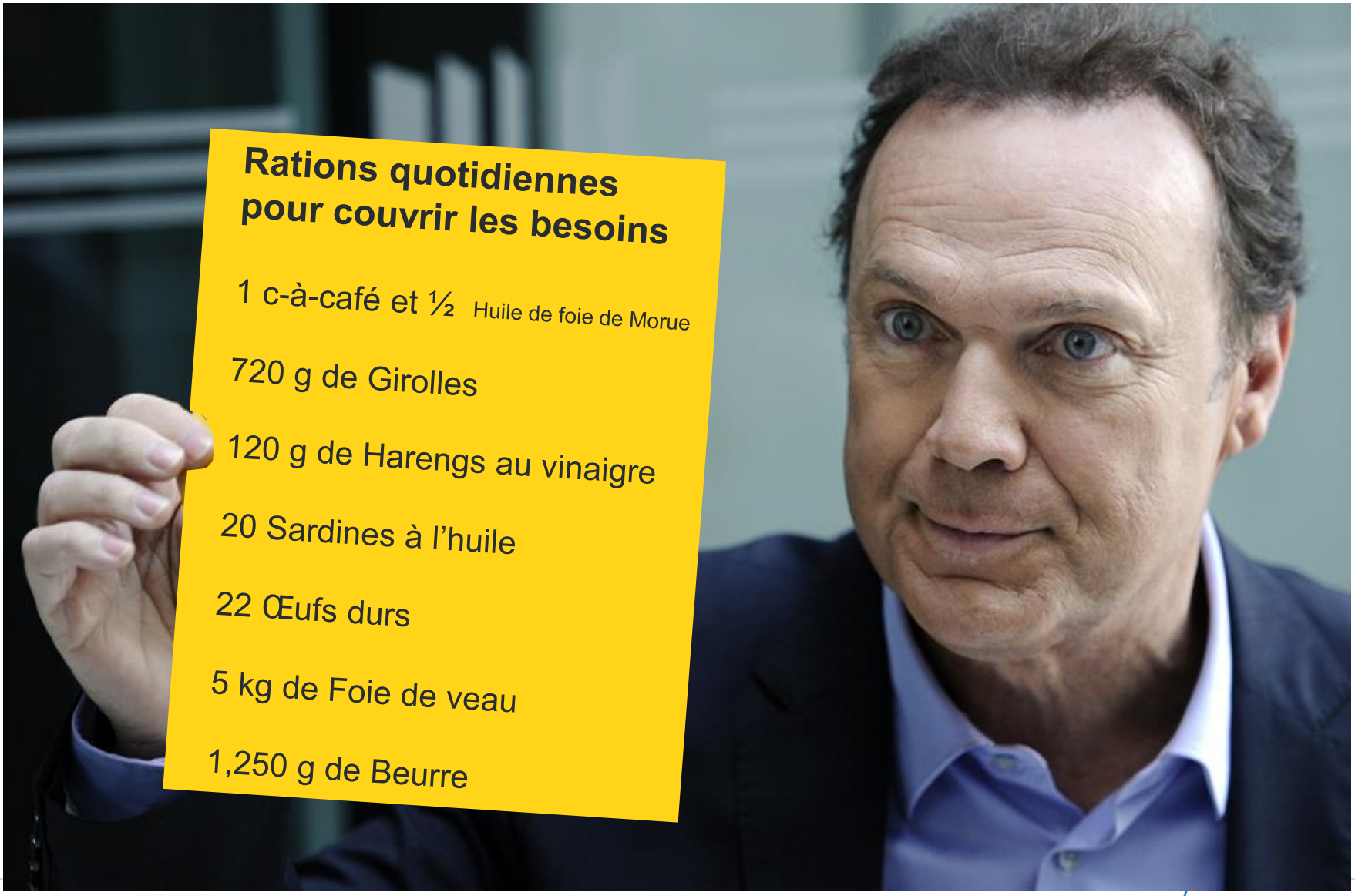
La dénutrition perturbe le système immunitaire



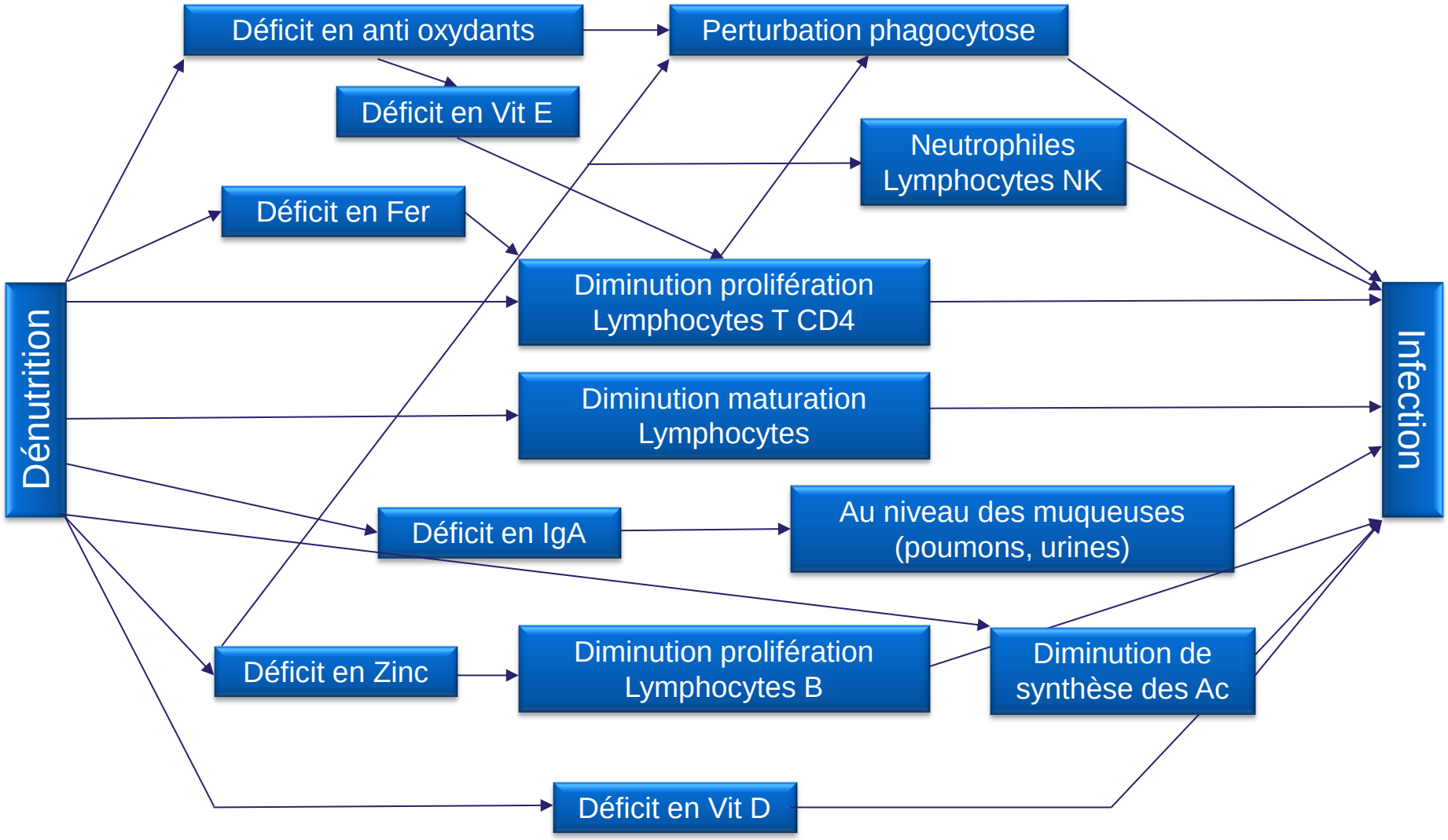
Pause: Question Architecture !

Pourquoi les sanatoriums avaient-ils une architecture héliotropique ?

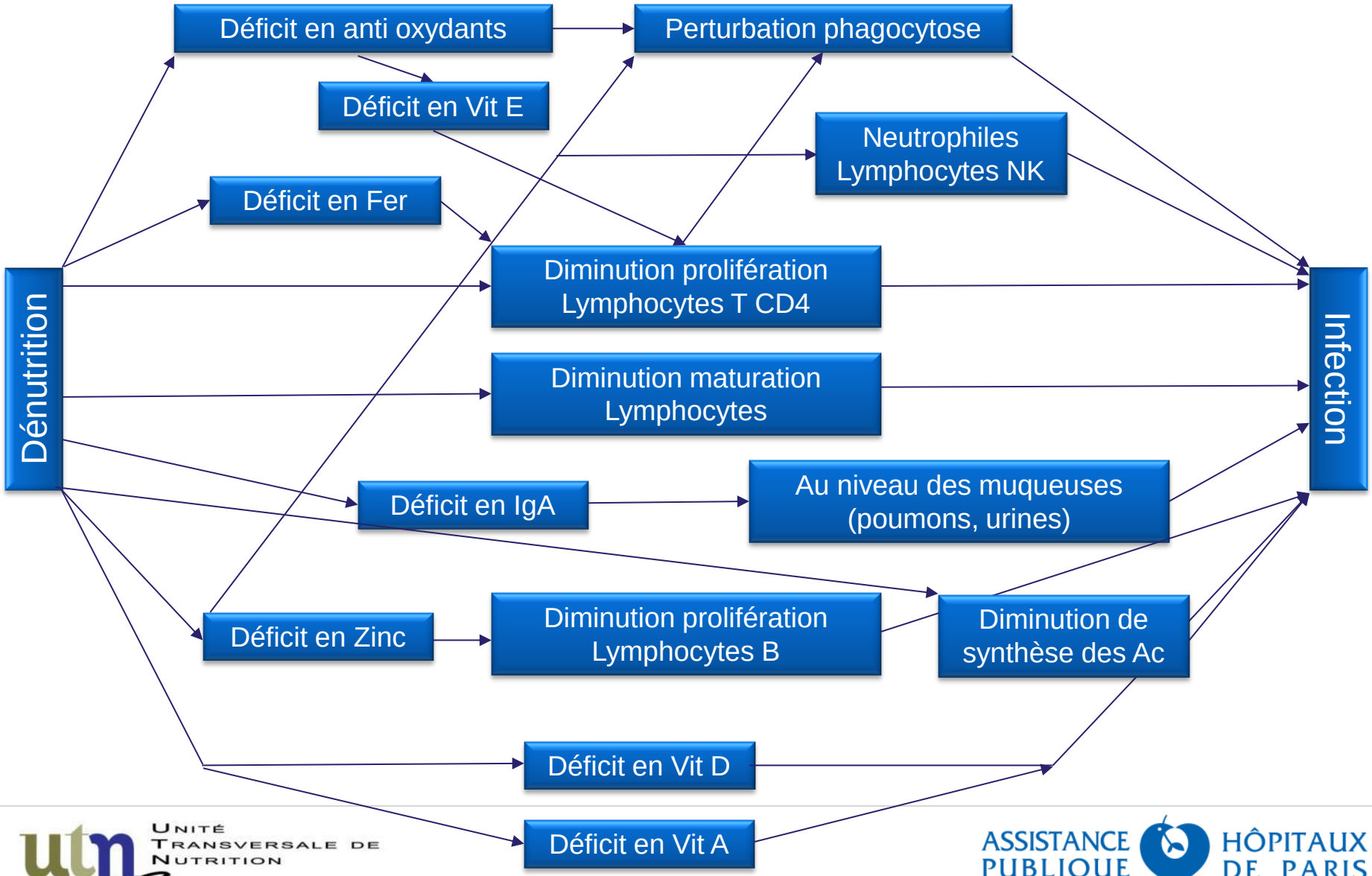
La vitamine D



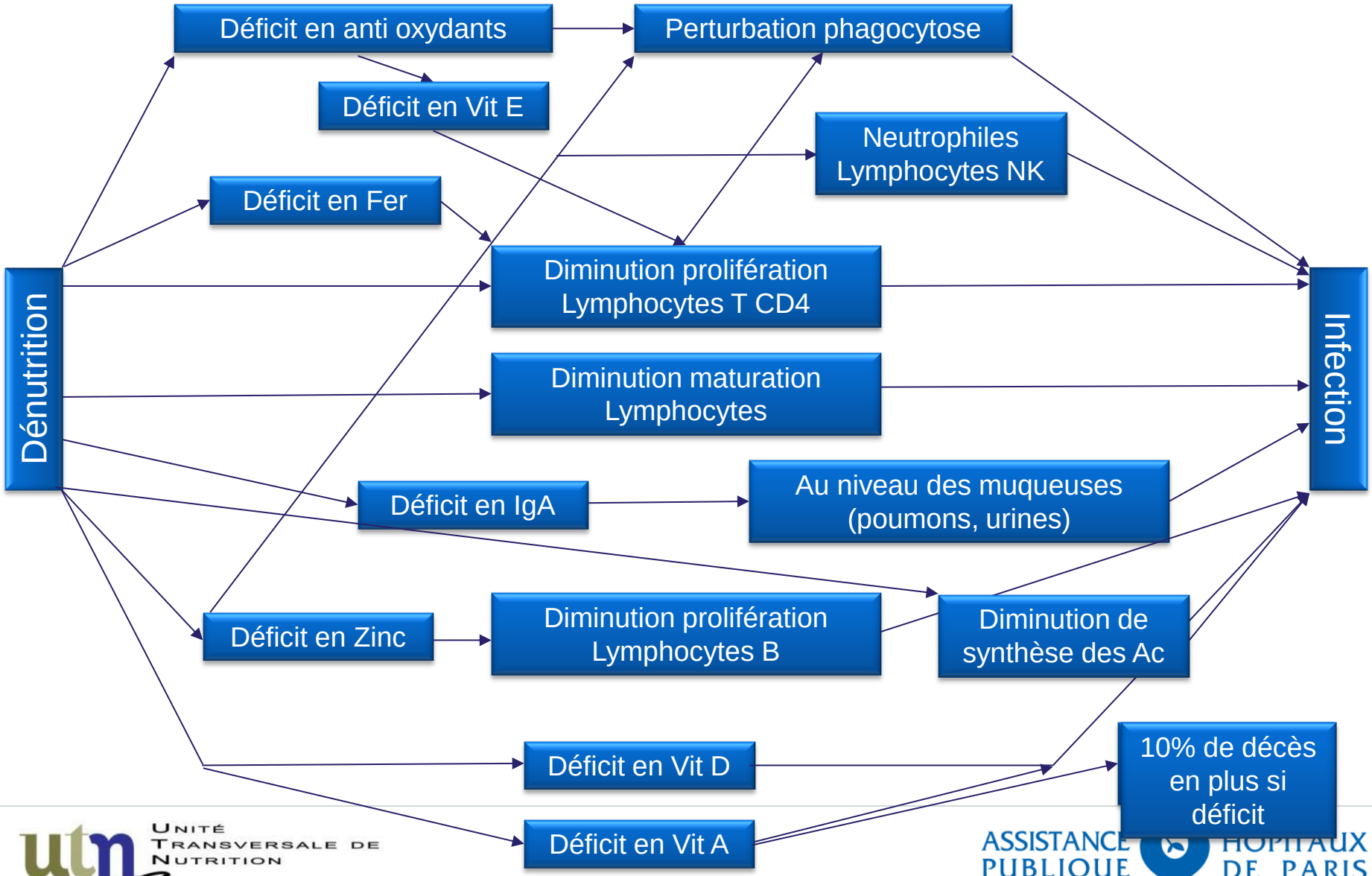
La dénutrition perturbe le système immunitaire



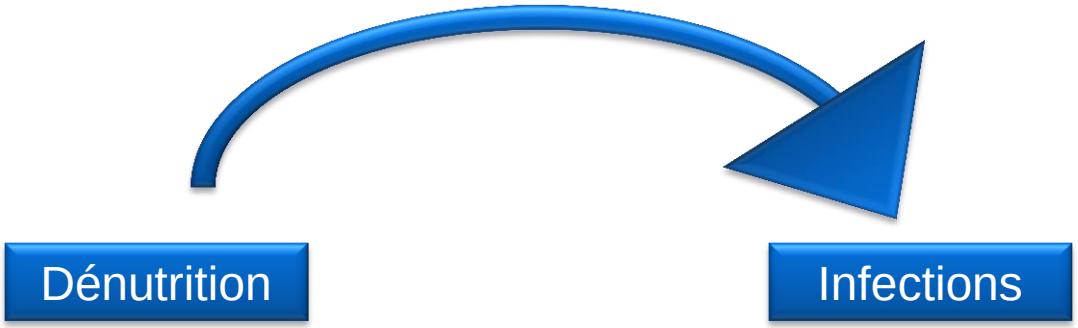
La dénutrition perturbe le système immunitaire



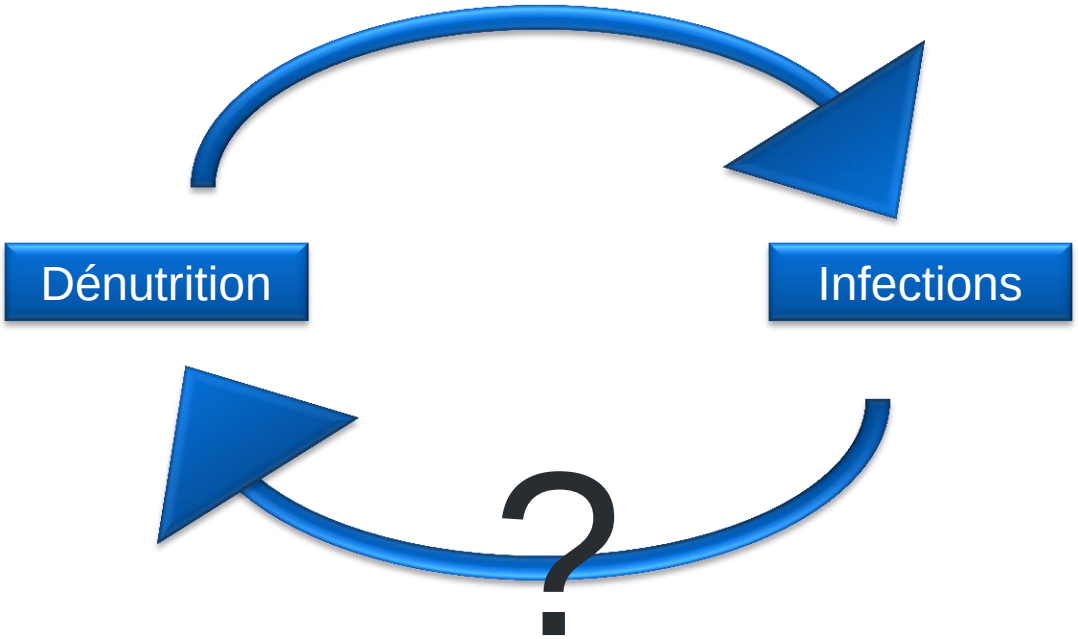
La dénutrition perturbe le système immunitaire



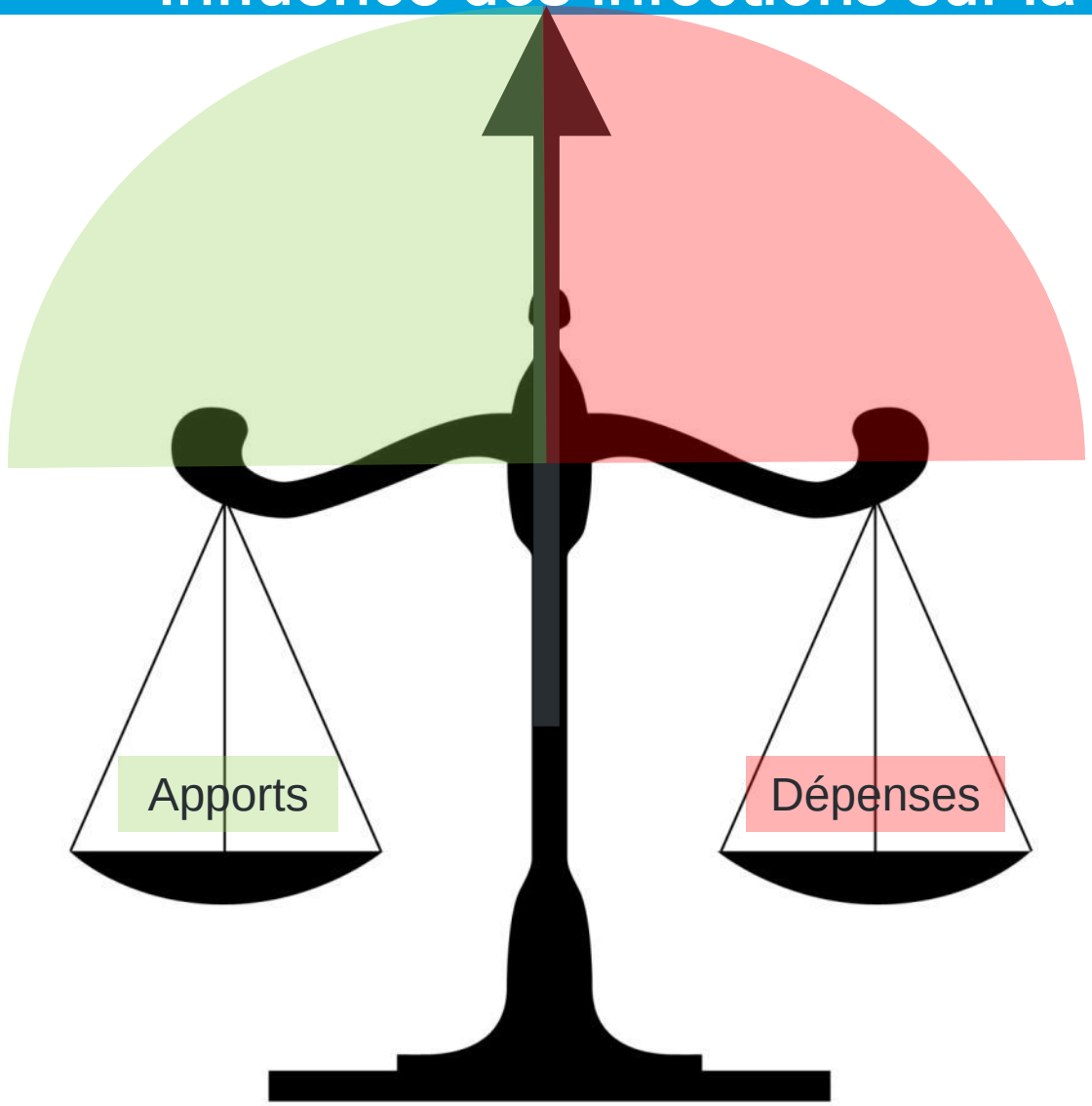
Influence de la dénutrition sur le système immunitaire



Influence des infections sur la dénutrition



Influence des infections sur la dénutrition



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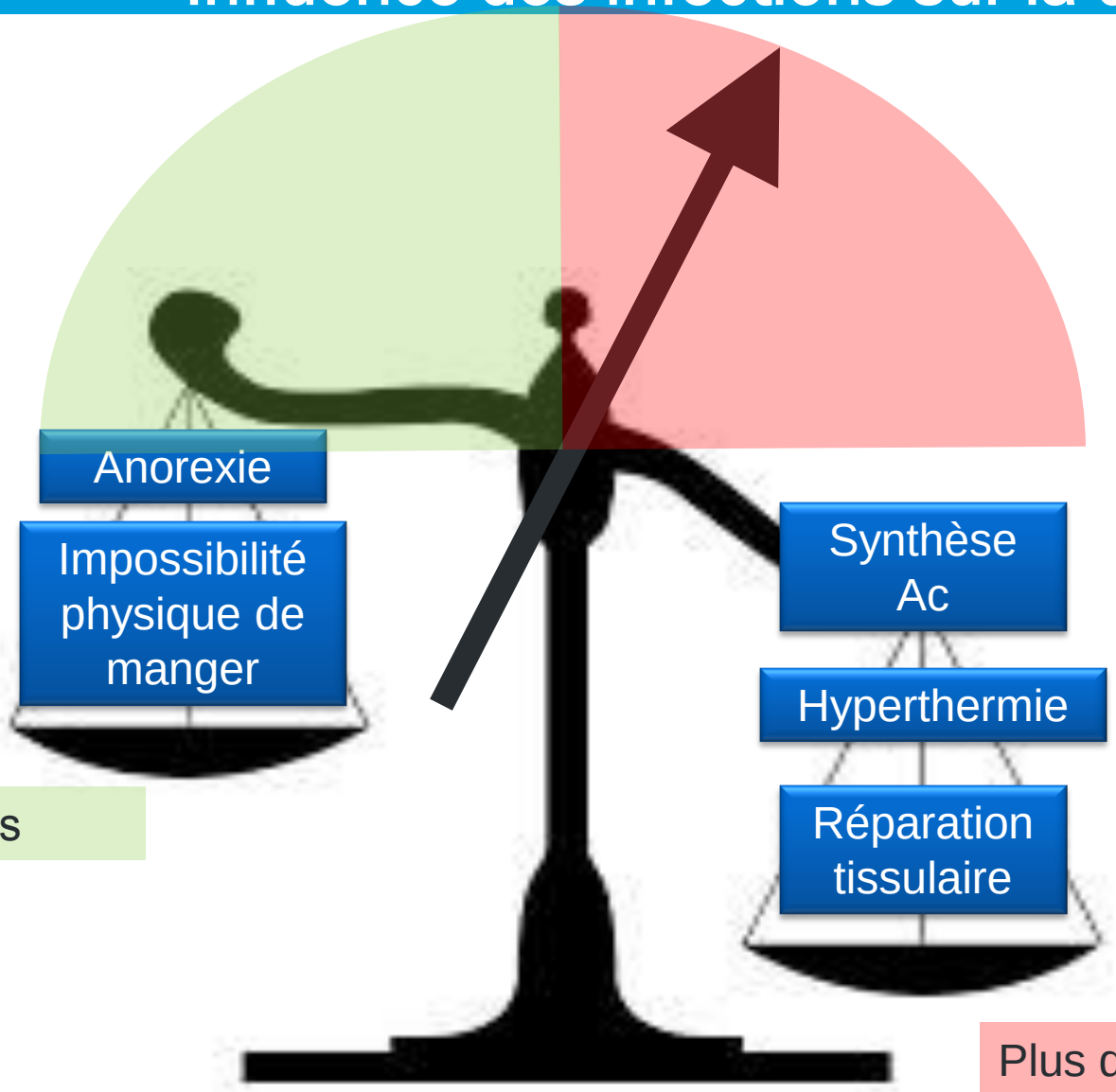
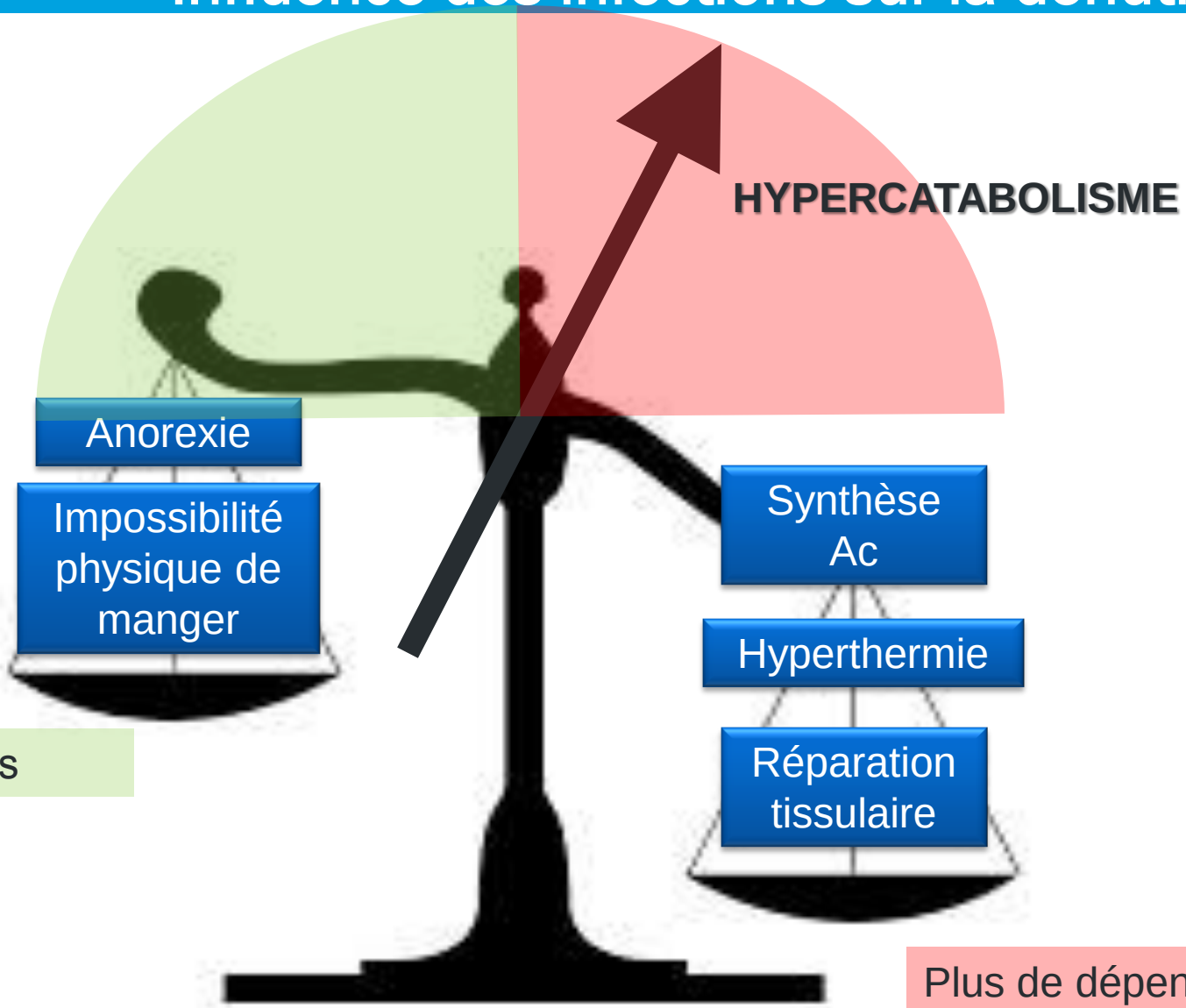


Moins d'apports

Plus de dépenses

Influence des infections sur la dénutrition



Moins d'apports

Plus de dépenses

Impact sur la dépense énergétique de repos

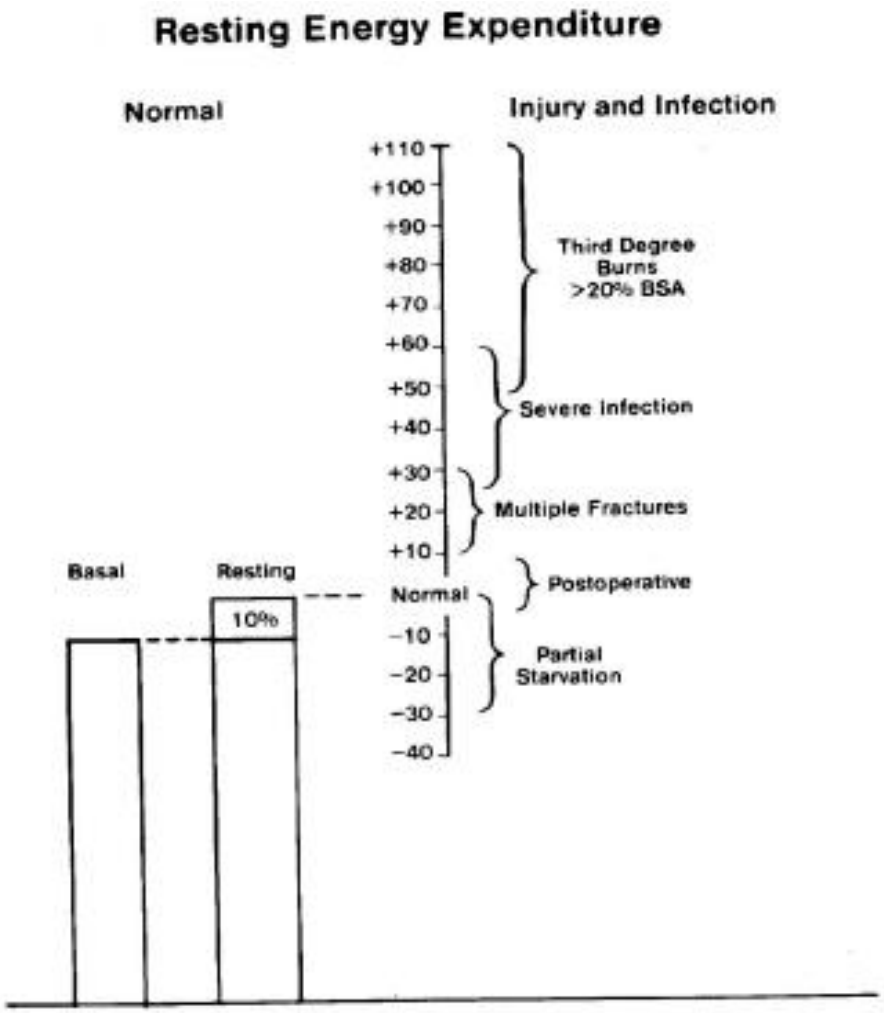
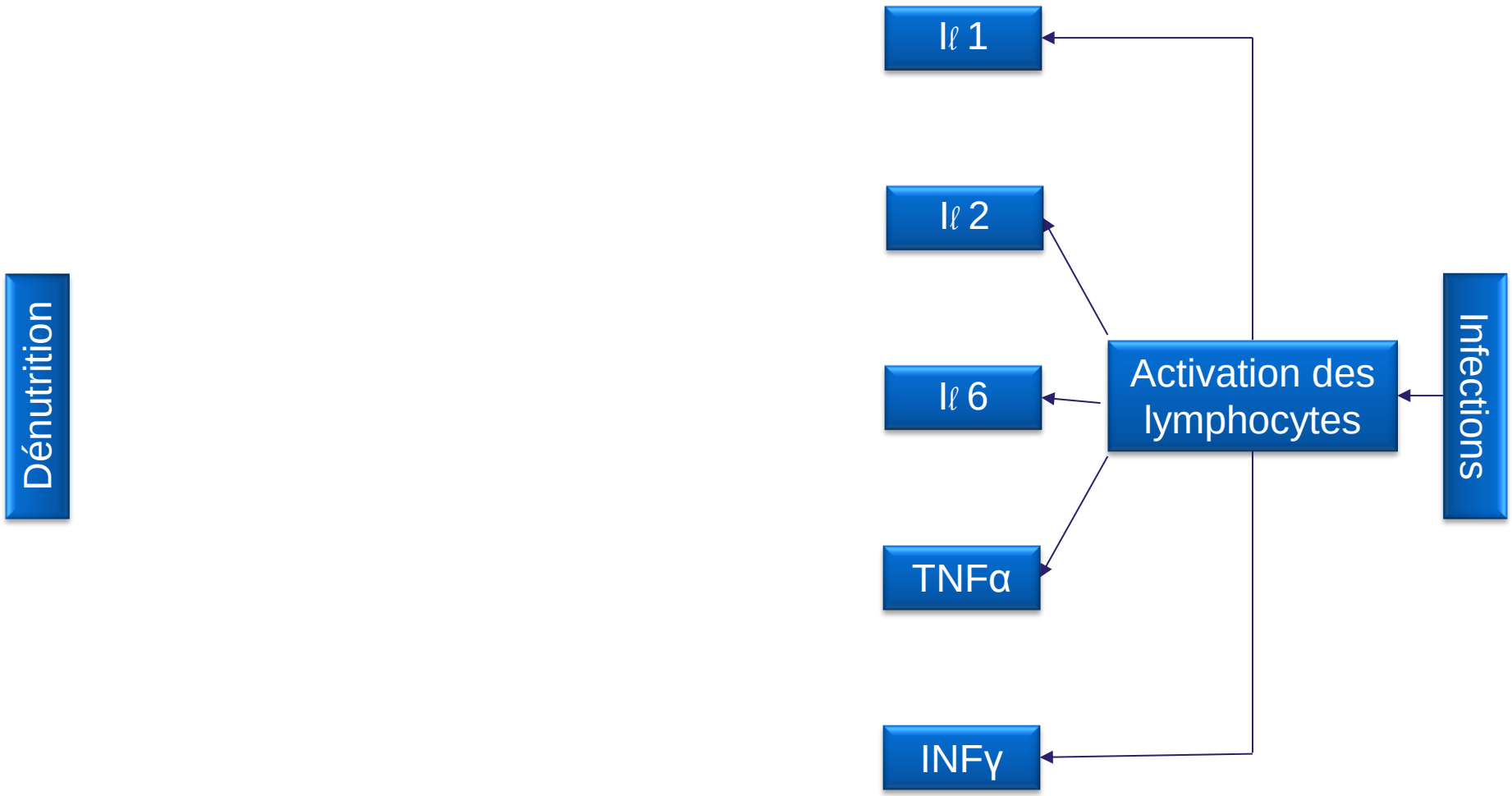


Figure 7.3. Based on data of Kinney et al. (46). Reproduced from Elwyn DH: Nutritional requirements of surgical patients. *Crit Care Med* 8:9-20, 1980. With permission of *Critical Care Medicine*. The effects of injury, sepsis, and nutritional depletion on resting energy expenditure.

Le syndrome inflammatoire provoque une dénutrition



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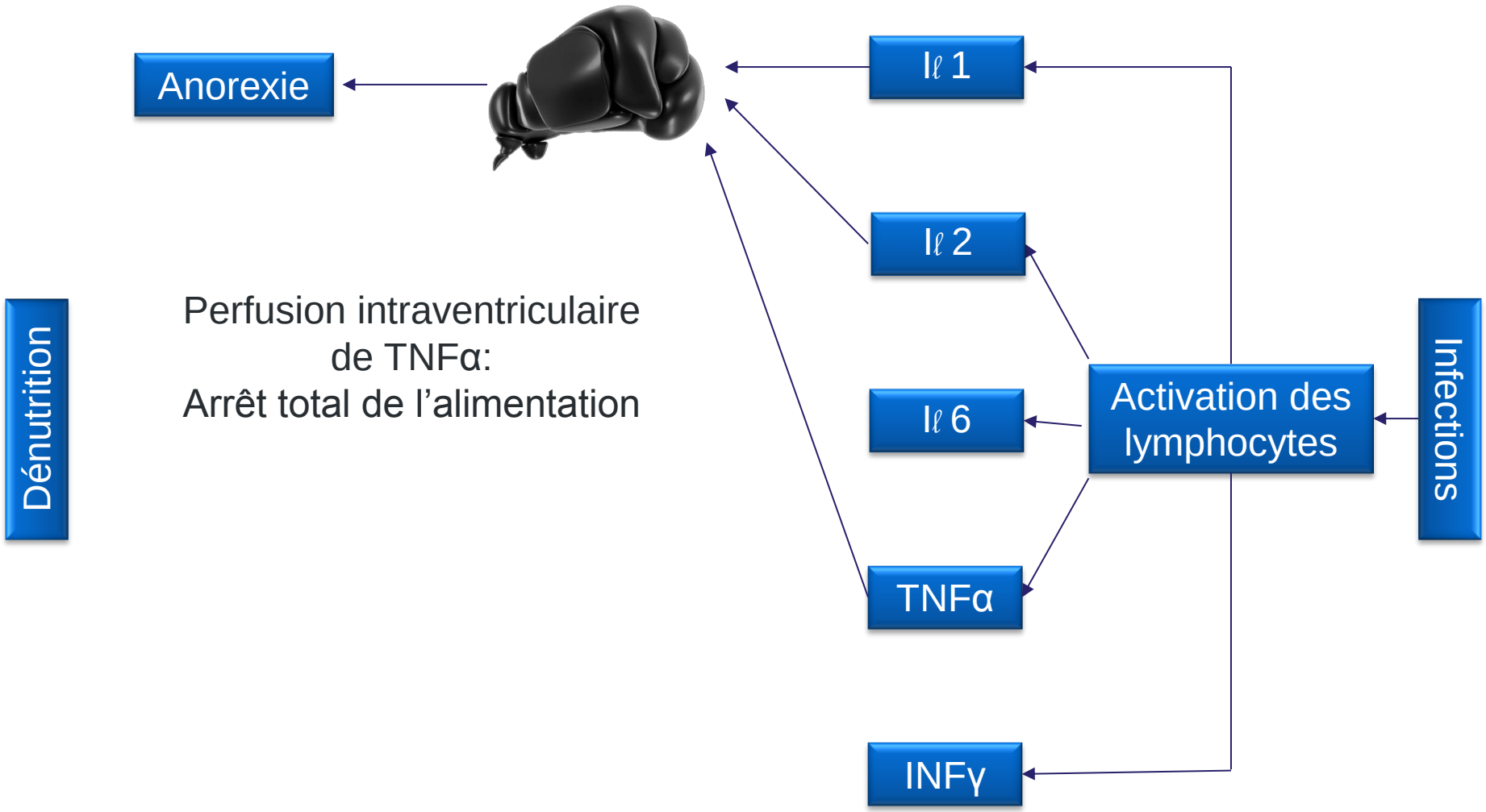

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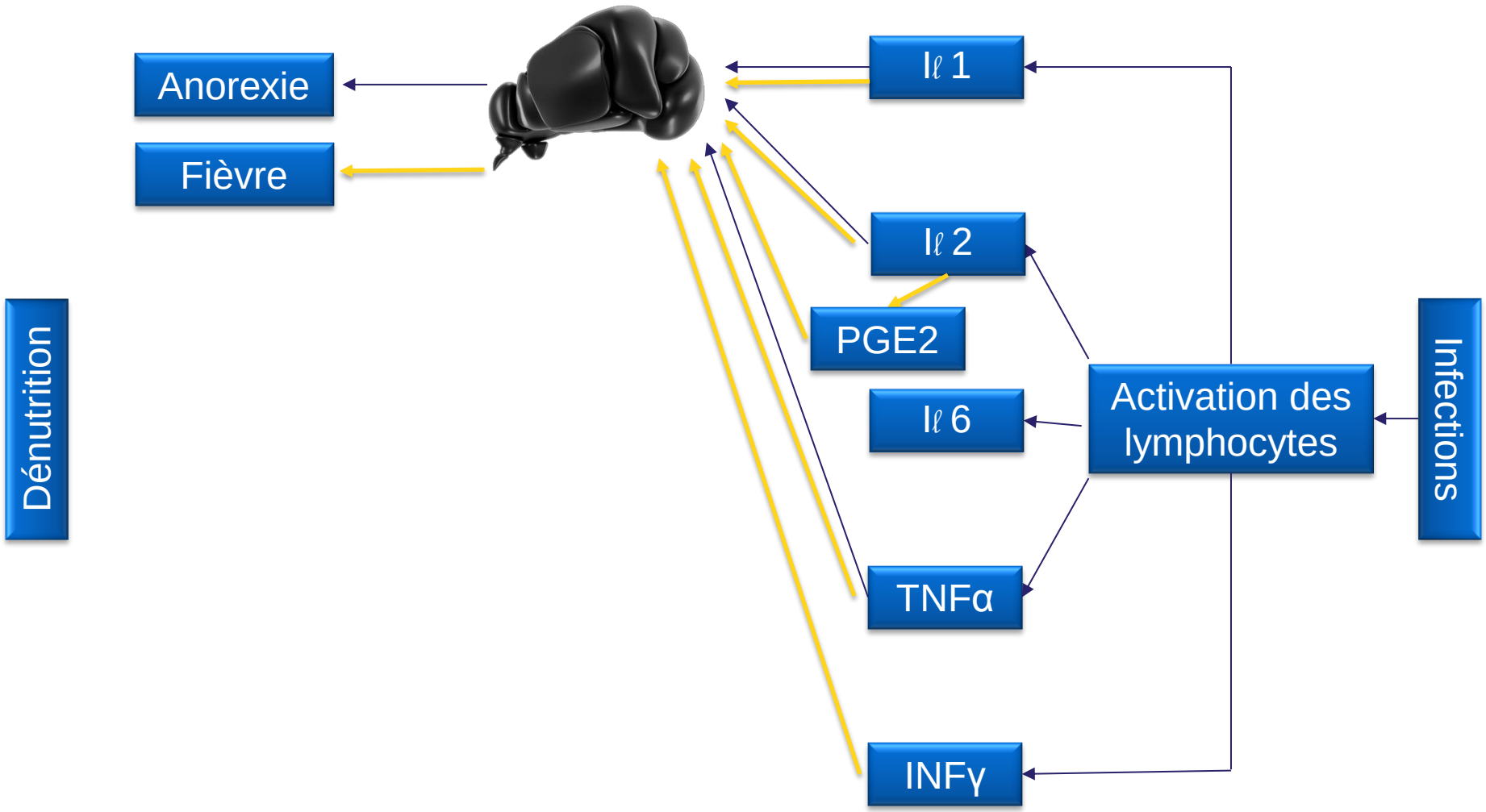

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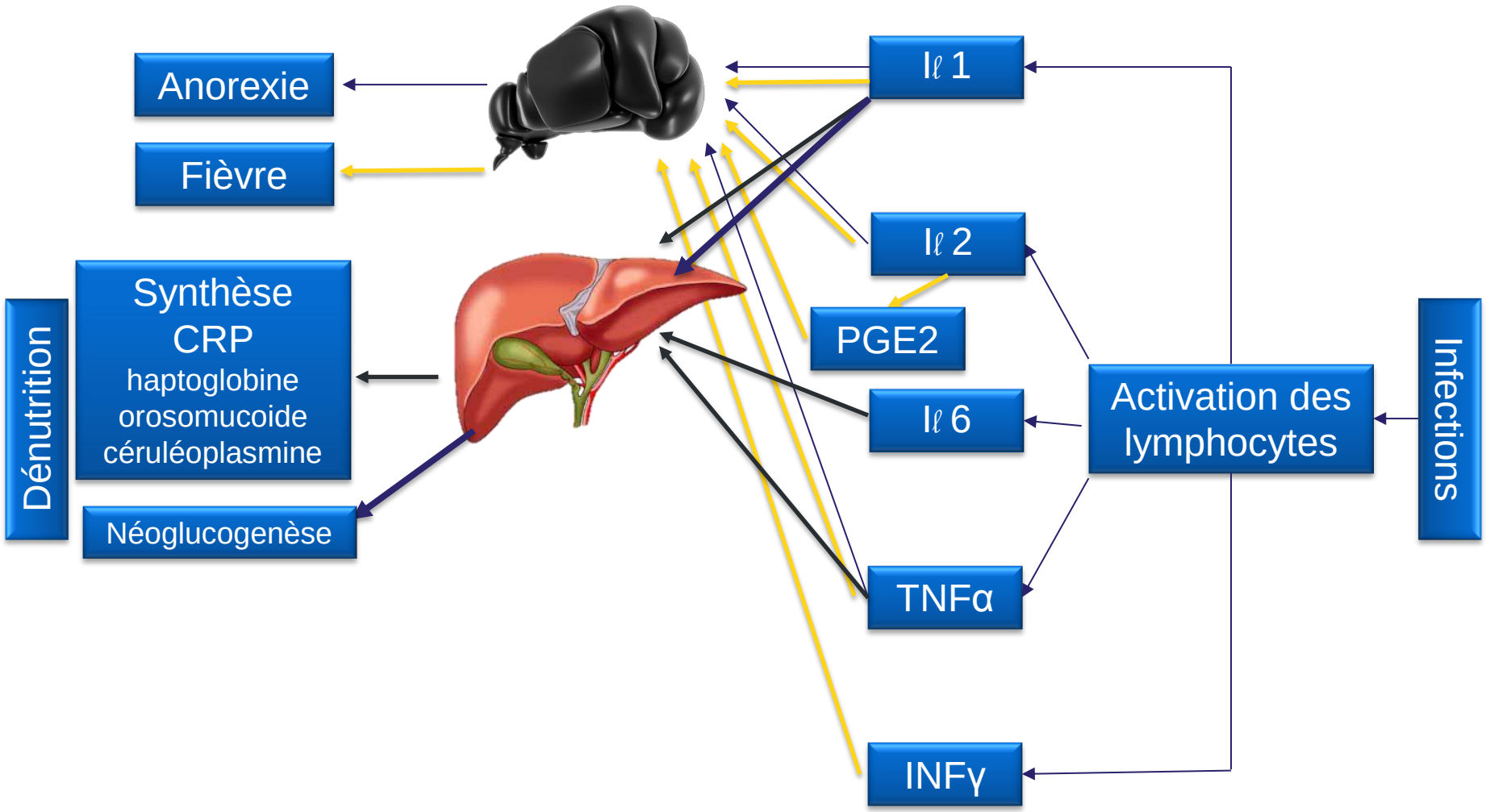

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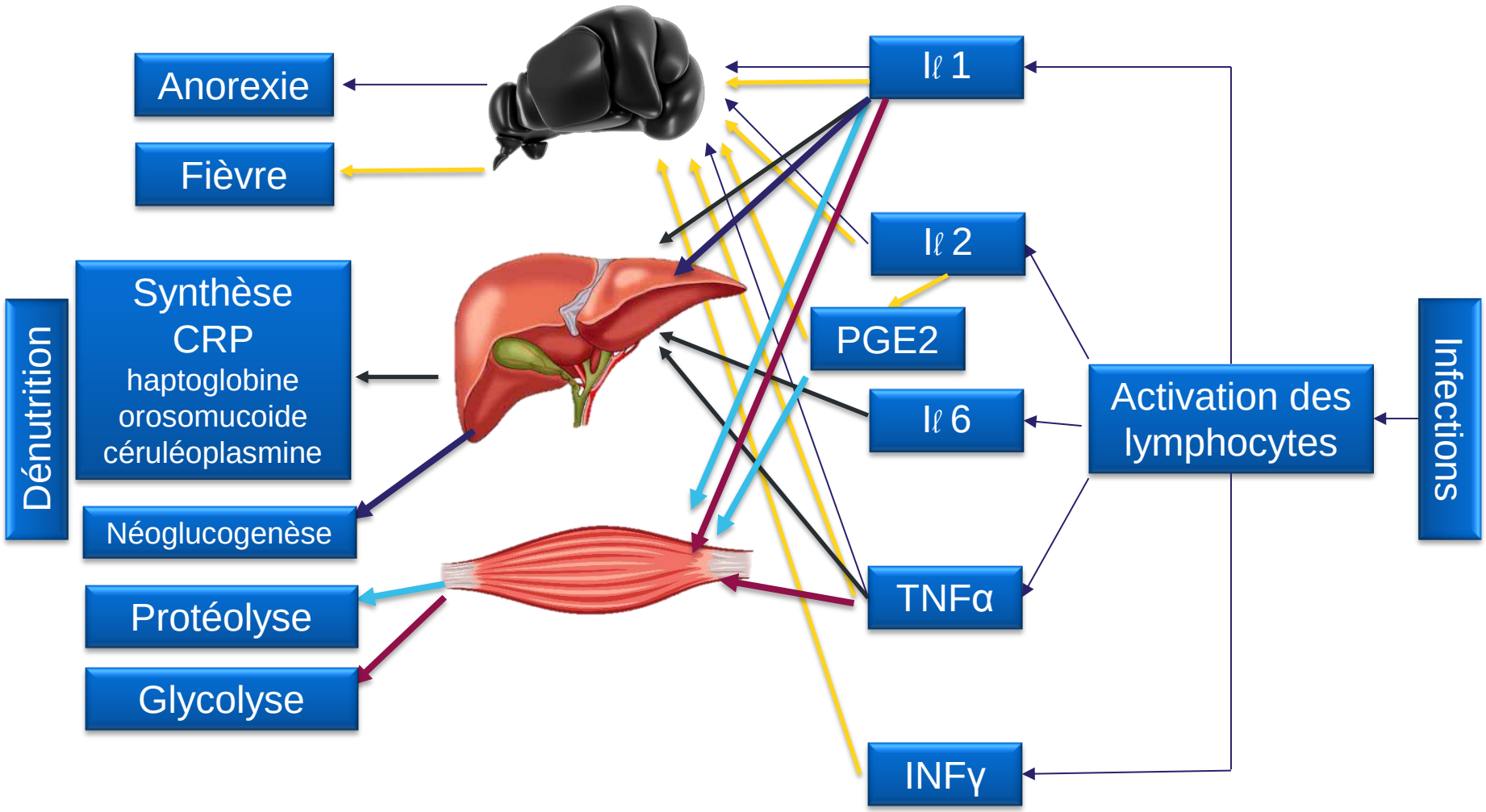

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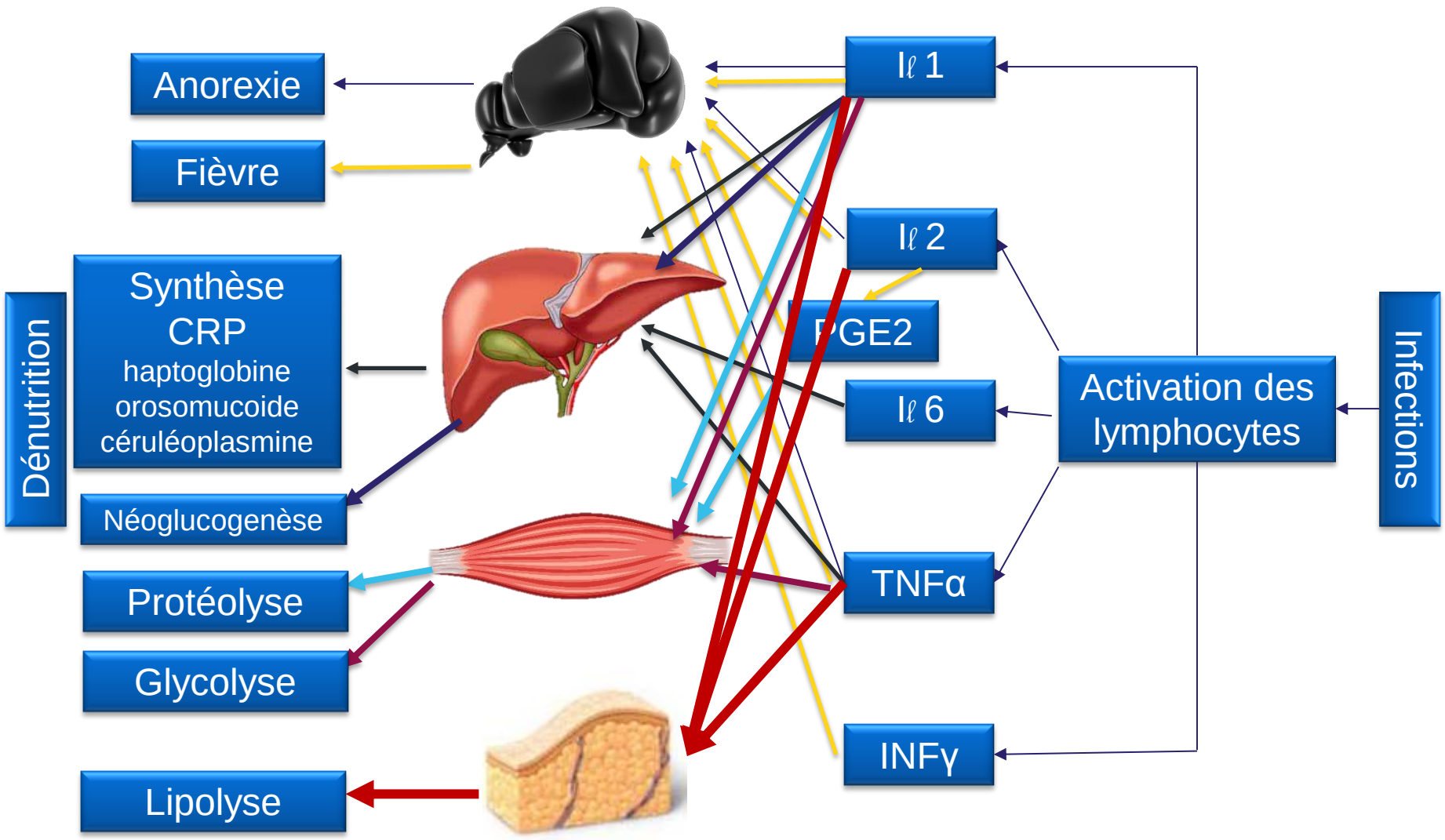

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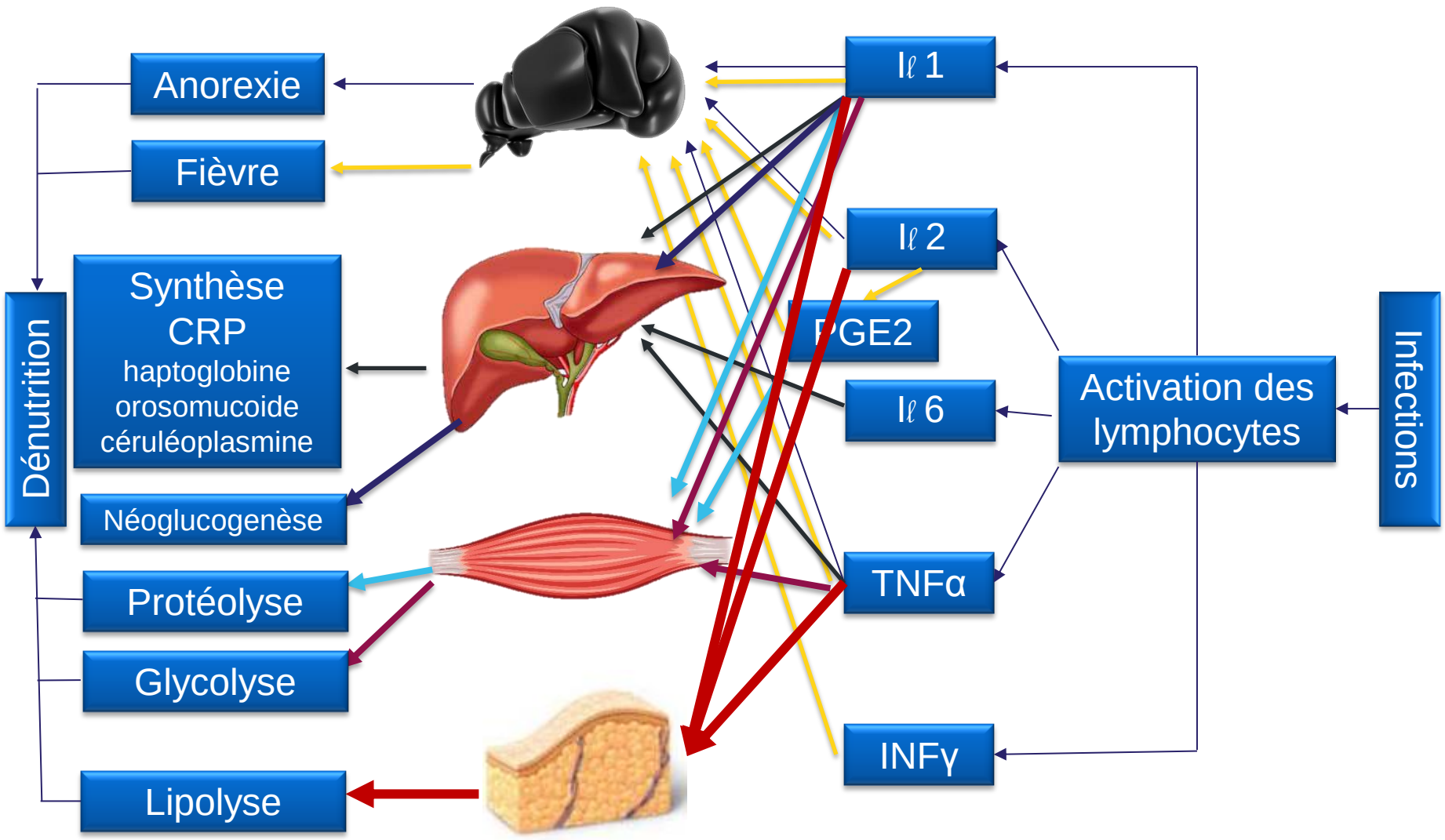
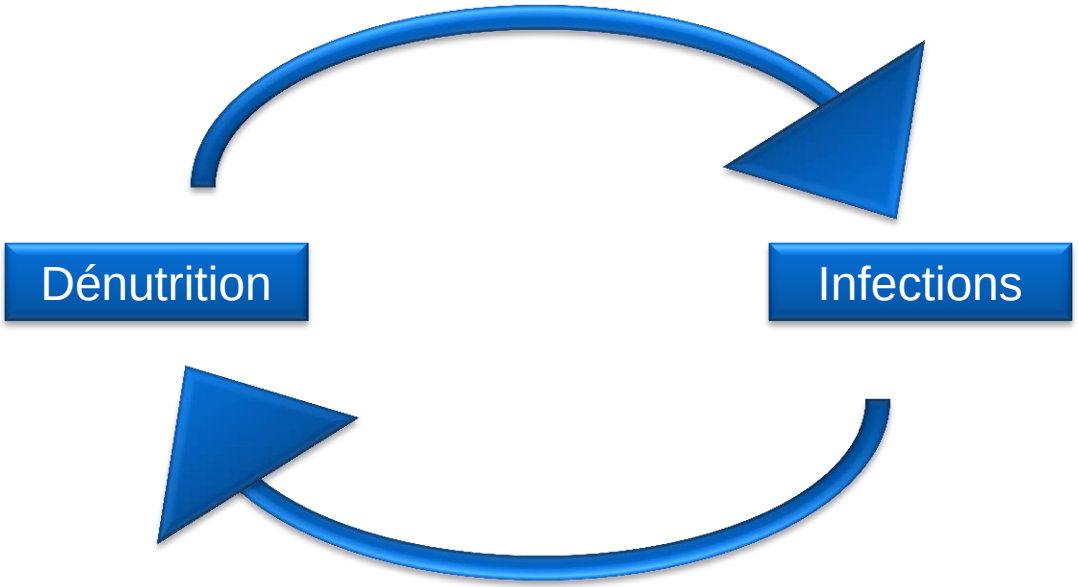
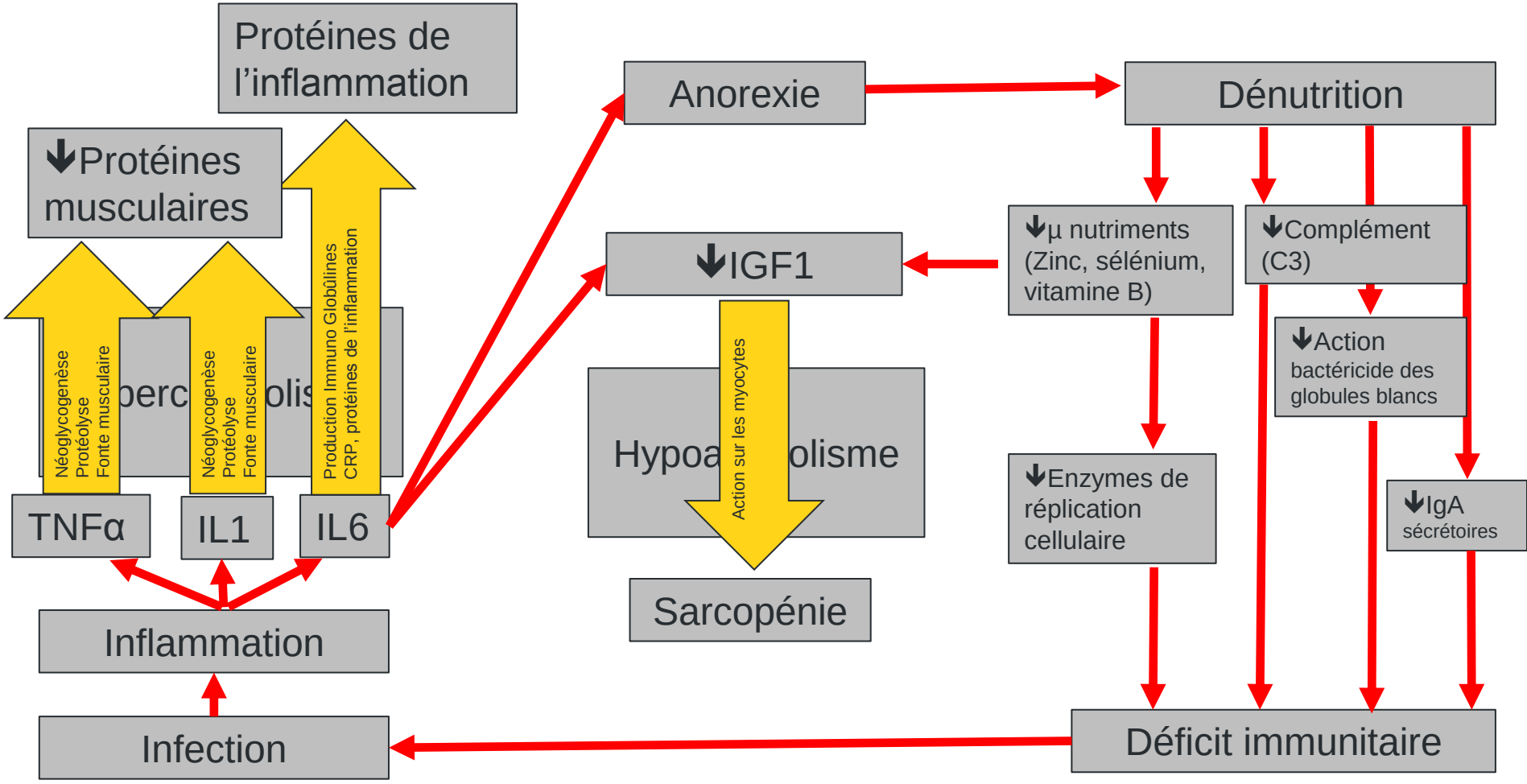


Influence des infections sur la dénutrition



Le cercle vicieux



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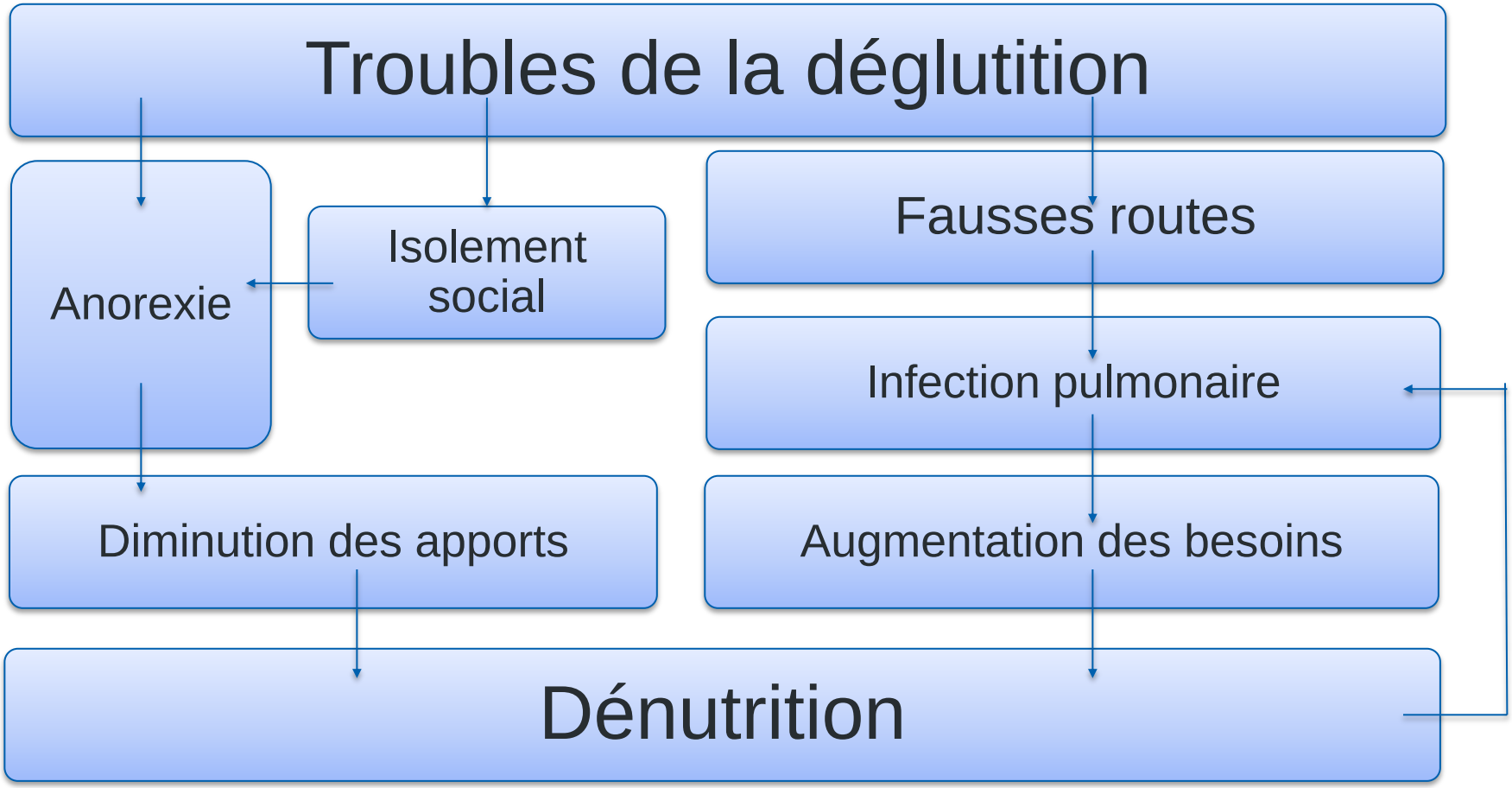
Les troubles de la déglutition



Conséquences médico-économiques

Conséquences médico-économiques

Age and Ageing 2005; **34:** 619–625
doi:10.1093/ageing/afi197

Relations between undernutrition and nosocomial infections in elderly patients

Elena Paillaud[1], Stephane Herbaud[1], Philippe Caillet[1], Jean-Louis Lejonc[1], Bernard Campillo[1], Phuong-Nhi Bories[2]

Table 1. Characteristics of the patients

	No infection	One infection	>One infection	
n	116	38	31	*P*
Age (years)	80.0 ± 0.7	84.4 ± 1.2	85.2 ± 1.3	0.0002
Gender (M/F) (*n*)	37/79	3/35	5/26	0.006
MMS	23.7 ± 0.7	20.1 ± 1.4	18.1 ± 1.5	0.0005
Length of stay (days)	60.1 ± 4.9	78.9 ± 10.7	122.2 ± 19.5	<0.0001
Time of infection after admission (days)		44.7 ± 10.4	22.0 ± 3.8	0.0293

Table 5. Association of clinical characteristics with infection

	No infection	One infection	>One infection	
n	116	38	31	*P*
Outcome				<0.0001
Nursing home	18	9	13	
	15.4%	22.5%	40.6%	
Return home	90	22	10	
	76.9%	55.0%	31.3%	
Death	5	8	9	
	4.3%	20.0%	28.1%	
Hospitalisation	4	1	0	
	3.4%	2.5%	0%	

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Conséquences médico-économiques

SL Lim, KCB Ong, YH Chan, WC Loke, M Ferguson, L Daniels

Malnutrition and its impact on cost of hospitalization, length of stay, readmission and 3-year mortality

Comparison of hospitalization outcomes, costs and mortality between well-nourished and malnourished patients (n=818).

Outcome variables	Well-nourished (n=583)	Malnourished[a] (n=235)
Length of hospital stay (days), mean ± sd	4.6 ± 5.6	6.9 ± 7.3
Length of hospital stay (days), median (range)	3 (1-63)	4 (1-59)

Conséquences médico-économiques

SL Lim, KCB Ong, YH Chan, WC Loke, M Ferguson, L Daniels

Malnutrition and its impact on cost of hospitalization, length of stay, readmission and 3-year mortality

Comparison of hospitalization outcomes, costs and mortality between well-nourished and malnourished patients (n=818).

Outcome variables	Well-nourished (n=583)	Malnourished* (n=235)
Readmission within 15 days of index admission, n (%)	61 (10.5)	40 (17.0)
Readmission within 90 days of index admission, n (%)	133 (22.8)	87 (37.0)
Readmission within 6 months of index admission, n (%)	187 (32.1)	113 (48.1)

Conséquences médico-économiques

SL Lim, KCB Ong, YH Chan, WC Loke, M Ferguson, L Daniels

Malnutrition and its impact on cost of hospitalization, length of stay, readmission and 3-year mortality

Comparison of hospitalization outcomes, costs and mortality between well-nourished and malnourished patients (n=818).

Outcome variables	Well-nourished (n=583)	Malnourished[a] (n=235)
Inpatient mortality, n (%)	2 (0.3)	10 (4.3)
1-year mortality, cumulative, n (%)	24 (4.1)	80 (34.0)
2-year mortality, cumulative, n (%)	39 (6.7)	100 (42.6)
3-year mortality, cumulative, n (%)	58 (9.9)	114 (48.5)

Conséquences médico-économiques

SL Lim, KCB Ong, YH Chan, WC Loke, M Ferguson, L Daniels

Malnutrition and its impact on cost of hospitalization, length of stay, readmission and 3-year mortality

Comparison of hospitalization outcomes, costs and mortality between well-nourished and malnourished patients (n=818).

Outcome variables	Well-nourished (n=583)	Malnourished[a] (n=235)
Cost of hospitalization for individual patient (S$), mean ± sd	3707 ± 5541	4606 ± 6665
Cost of hospitalization for individual patient (S$), median (range)	1897 (179-70472)	2534 (297– 50215)

Conséquences médico-économiques

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Preoperative Immunonutrition: Cost-Benefit Analysis

Marco Braga, MD*; and Luca Gianotti, MD, ScD†

Evaluation économique d'un traitement par Impact (cinq jours pré-opératoires) avant chirurgie digestive lourde chez les malades non dénutris atteints d'un cancer digestif

Comparaison du groupe Impact pré-opératoire au groupe contrôle

Calcul du coût direct des complications, Frais de laboratoires, Traitements, Matériel supplémentaire, Ré-interventions chirurgicales ou autres gestes, Consultations de suivi, Forfait par jour d'hospitalisation

Chirurgie colo-rectale : 288 €/jour
Chirurgie oeso-gastrique : 365 €/jour
Chirurgie pancréatique : 419 €/jour
Forfait de 930 €/jour de soins intensifs

Coût du traitement nutritionnel

Conséquences médico-économiques

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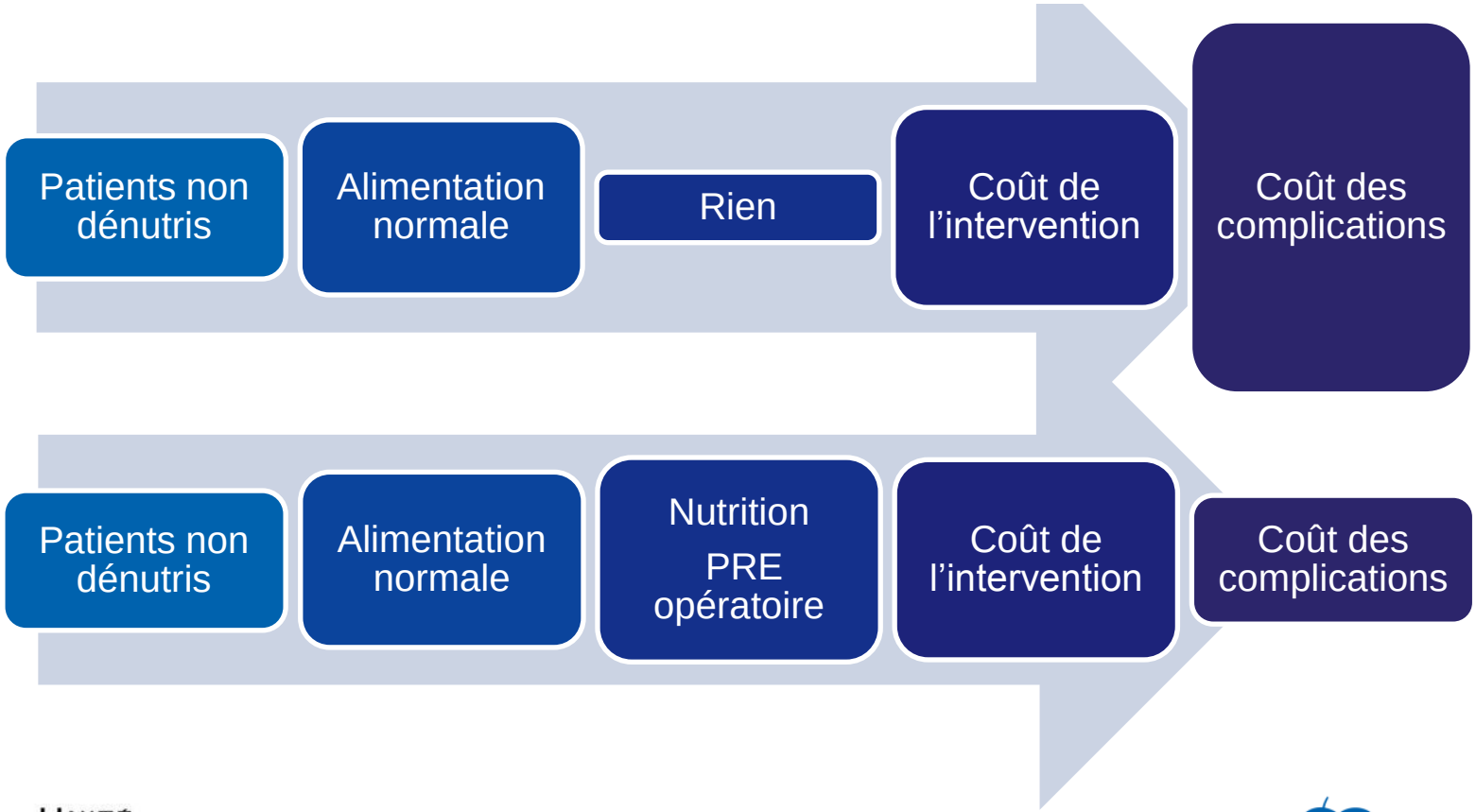
Preoperative Immunonutrition: Cost-Benefit Analysis

Marco Braga, MD*; and Luca Gianotti, MD, ScD†



Conséquences médico-économiques

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Preoperative Immunonutrition: Cost-Benefit Analysis

Marco Braga, MD*; and Luca Gianotti, MD, ScD†

TABLE I *Outcome variables**

	Conventional	Preoperative
Patients with infectious complications	31	14†
Patients with noninfectious complications	36	30
Patients with any complication	49	36
Length of hospital stay (days)	14.0 (7.7)	11.6 (4.7)‡

Conséquences médico-économiques

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Preoperative Immunonutrition: Cost-Benefit Analysis

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TABLE II *Postoperative complications in detail*

	Conventional group	Preoperative group	Total
Anastomotic leak	10	4	14
Abdominal abscess	10	4	14
Pancreatic fistula	5	5	10
Wound infection	11	7	18
Respiratory failure	6	6	12
Delayed gastric emptying	5	6	11
Respiratory tract infection	8	3	11
Sepsis	2	0	2
Wound dehiscence	3	3	6
Circulatory insufficiency	4	6	10
Urinary tract infection	5	4	9
Bleeding	4	2	6
Pleural effusion	4	2	6
Bacteriemia	5	0	5
Intestinal obstruction	1	1	2
Renal dysfunction	2	1	3
Overall	85	54	139

Conséquences médico-économiques

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Preoperative Immunonutrition: Cost-Benefit Analysis

Marco Braga, MD*; and Luca Gianotti, MD, ScD†

TABLE VII *Cost-effectiveness analysis*

	Conventional	Preoperative
Total complication costs	315,078	176,282
Complication costs/patient	3089	1728
Nutritional costs/patient	33	144
Total costs/patient	3122	1872*
Effectiveness, %	50.0	62.8
Cost-effectiveness	6244	2985

Conséquences médico-économiques

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Preoperative Immunonutrition: Cost-Benefit Analysis

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TABLE VI *Total costs and DRG reimbursement rates*

	Conventional	Preoperative
Uncomplicated patients costs	184,725	229,208
Complicated patients costs	535,236	334,148
Nutrition costs	3407	14,729
Total costs	723,368	578,085
DRG reimbursement	781,392	740,301

DRG, diagnosis-related group.

Conséquences médico-économiques

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Preoperative Immunonutrition: Cost-Benefit Analysis

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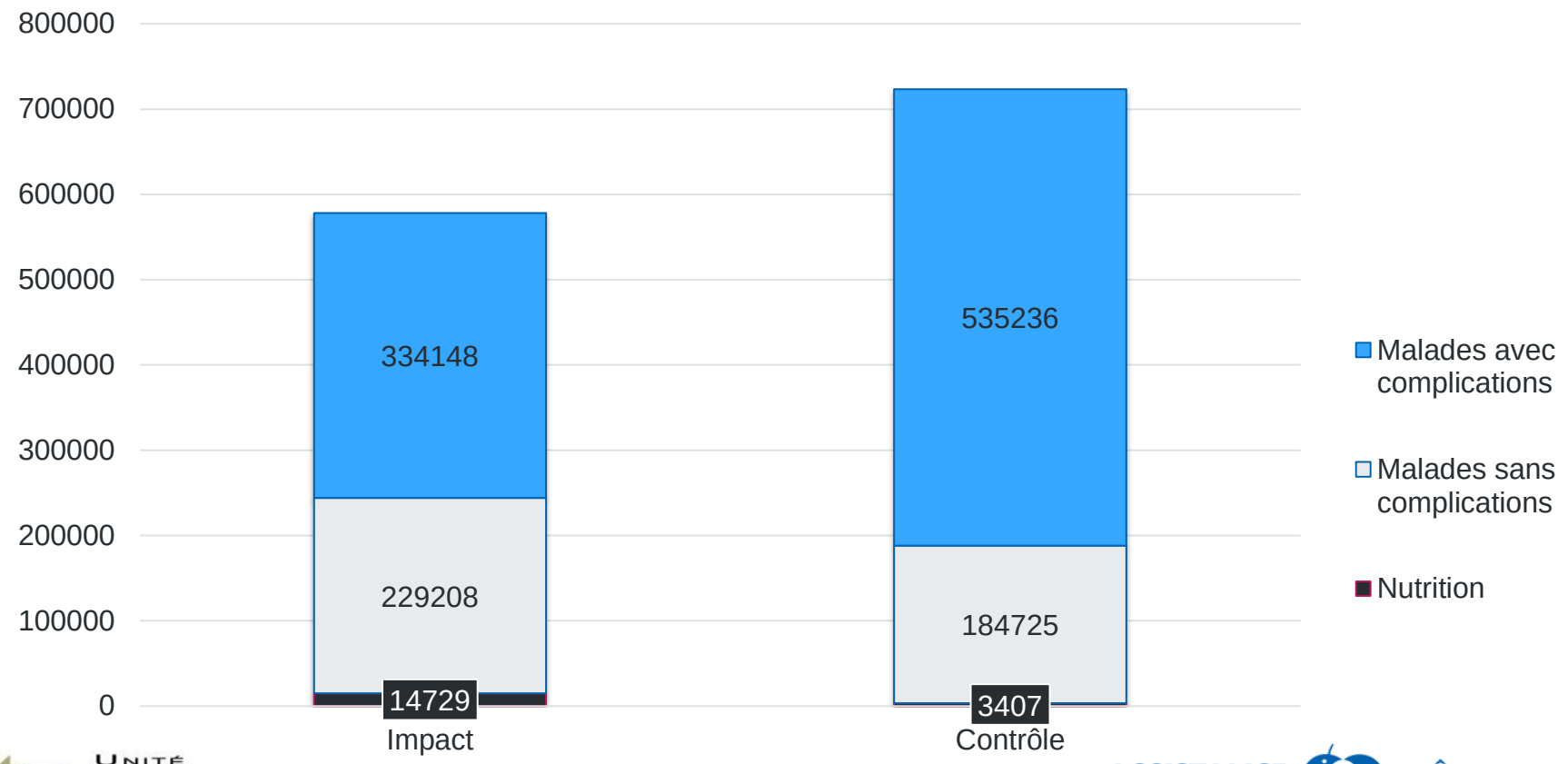

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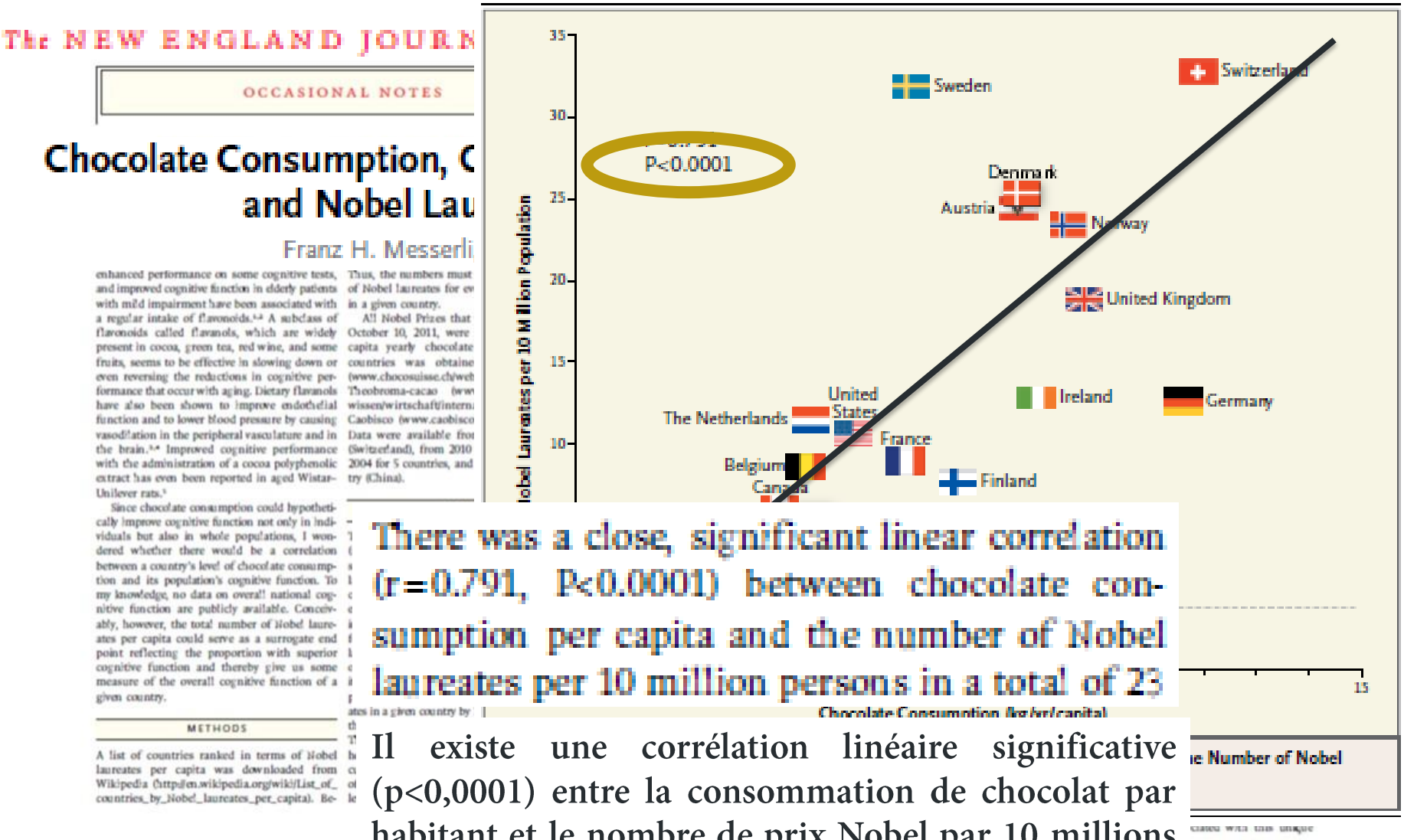
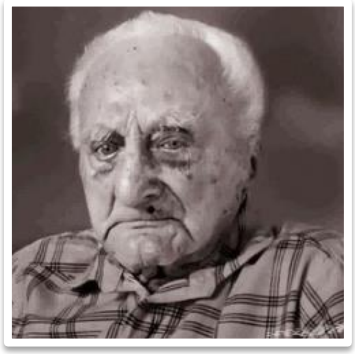
Encore une étude sur la nutrition…

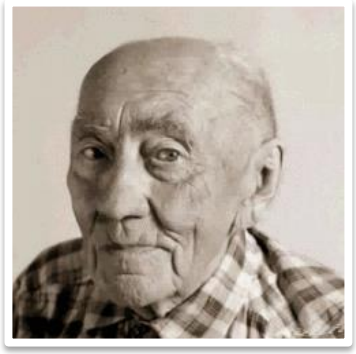


There was a close, significant linear correlation (r=0.791, P<0.0001) between chocolate consumption per capita and the number of Nobel laureates per 10 million persons in a total of 23

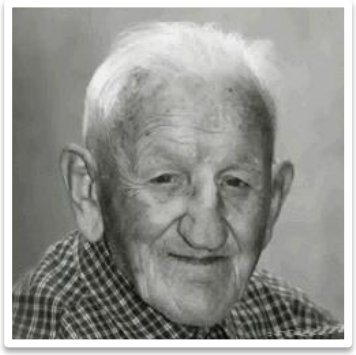
Il existe une corrélation linéaire significative (p<0,0001) entre la consommation de chocolat par habitant et le nombre de prix Nobel par 10 millions d'habitants sur un total de 23 pays.

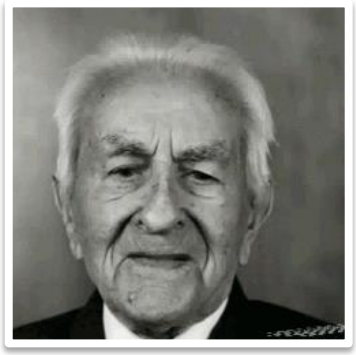
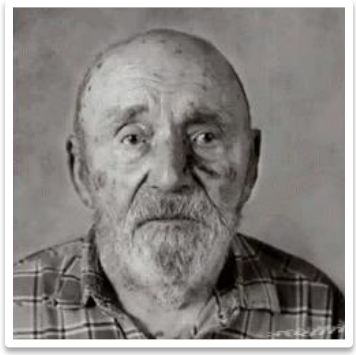
Merci pour votre attention









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