



Integrated clinical pharmacology and therapeutics
for medical students:
multidisciplinary approach
for flipped classroom
using video resources



JL. Belche, T. Kang, V. Massart, D. Giet



Common Clinical case

- Donald T.
- 72 y.
- Anxiety-depression
- CKD-specific program for CKD
- Diabete-Specific program for Diabete
- ...

Background

- High prevalence of polypharmacy for patients with multimorbidity
- Fragmentation in health care (and teaching) remains the rule
- Consequences at different levels: patient, society

! Every doctor, whatever his speciality, share the responsibility

! Important to integrate therapeutics needs in the education of each future doctors.

Aim



To design, implement and evaluate a method of clinical pharmacology and therapeutics (CPT) learning

- through a multidisciplinary and integrated process
- using a motivating approach
- for final-year medical students

Public

- Last year of the cursus
 - Basics knowledges in CPT & introduction to complexity
 - 220 medical students in ULiege

Methods: pedagogical leitmotivs

Student's motivation through effective learning

- Meaningful activities
 - Close to reality and daily practice, moderate complexity
- Active learning
 - Reflexion, action & decision
- Accessibility and quality of resources
- Feedback to students

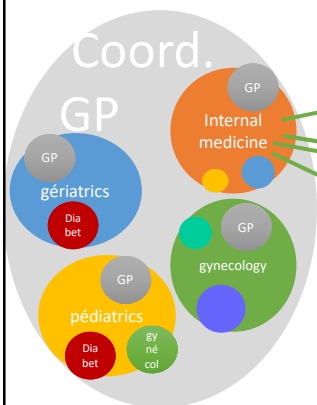
Integration through multidisciplinary collaboration

- At all stages
 - Design, implementation, regulation
- Isomorphic method
 - "we do what we want students do"

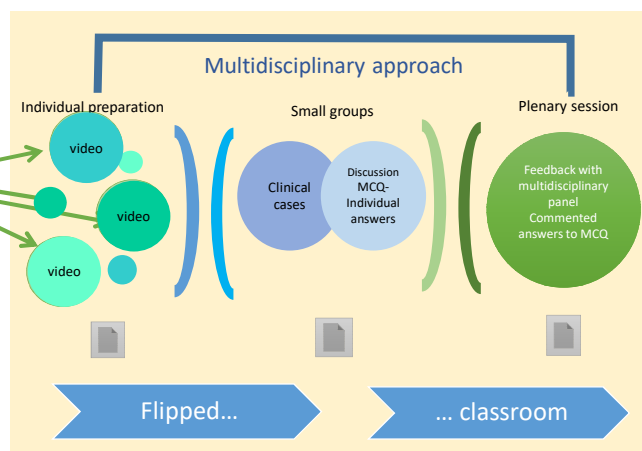
→ Flipped classroom using video resources and integrated clinical cases
« Lectures at home and homework in class »

Methods: flipped classroom

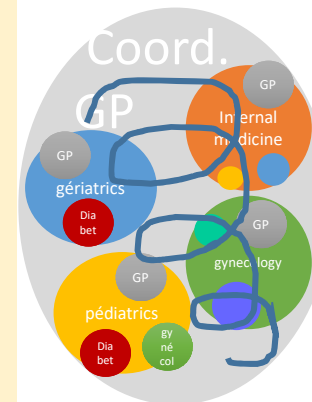
4 modules :
interdisciplinary preparation
by **teachers**



Students



4 modules :
interdisciplinary debriefing
by **teachers**



Conclusion



Motivation and integration

- Learning device= innovative method for participants, generating motivation for students and teachers, consistency with the topic
- Multidisciplinary approach = innovative way to tackle complexity of CPT for real patients (complexity, multimorbidity) and bringing integrated answers

Limits

- Time for effective student's preparation
- Diversified CPT resources: introduced
 - according to flipped classroom method
- Resistance to innovation among medical teacher's

Conclusion and future

Pour aller plus loin...

- Encourager le travail interdisciplinaire entre étudiants de différentes filières
- Développer les occasions d'intégrer les matières tout au long du cursus médical
- Promote working together of students from different disciplines
- increase opportunities for integrated learning in the medical cursus



Integrated clinical pharmacology and therapeutics
for medical students:
multidisciplinary approach
for flipped classroom
using video resources

Thank you for your attention

[JeanLuc Belche: jlbelche@uliege.be](mailto:jlbelche@uliege.be)

Electronic platform

- Accessibility of ressources
- Forum for discussion

Videos conformed to a pedagogic-determined format:

- 6 to 9 minutes,
- talking head with expert
- slides in the background

Electronic platform

Workshop-small groups of student (15)

- analysis of clinical cases
- individual answers on MCQ/electronic platform

Multidisciplinary teacher's group:

- analysis of the students' answers to MCQ
- tailored adaptation of plenary debriefing



Debriefing session

- Feedback on MCQ
- Interaction with multiplinary teachers team

Flipped classroom

	double topics	
traditional	In the class with teachers Lectures On topics	Without the class, without teachers Transfert Exercices
flipped classroom	Without the class, without teachers Content learning video	In the class with teachers Transfert Active pedagogy

(Dumont A., Berthiaume, la pédagogie inverse, De Boeck, 2016)

Knowledge sharing
Regulation of learning between peers
Loss of the monopoly of the expertise by the teacher (teacher = accompanist)
Interactivity during learning between leaners and between teachers and leaners

Contextualization of learning

Problem based learning

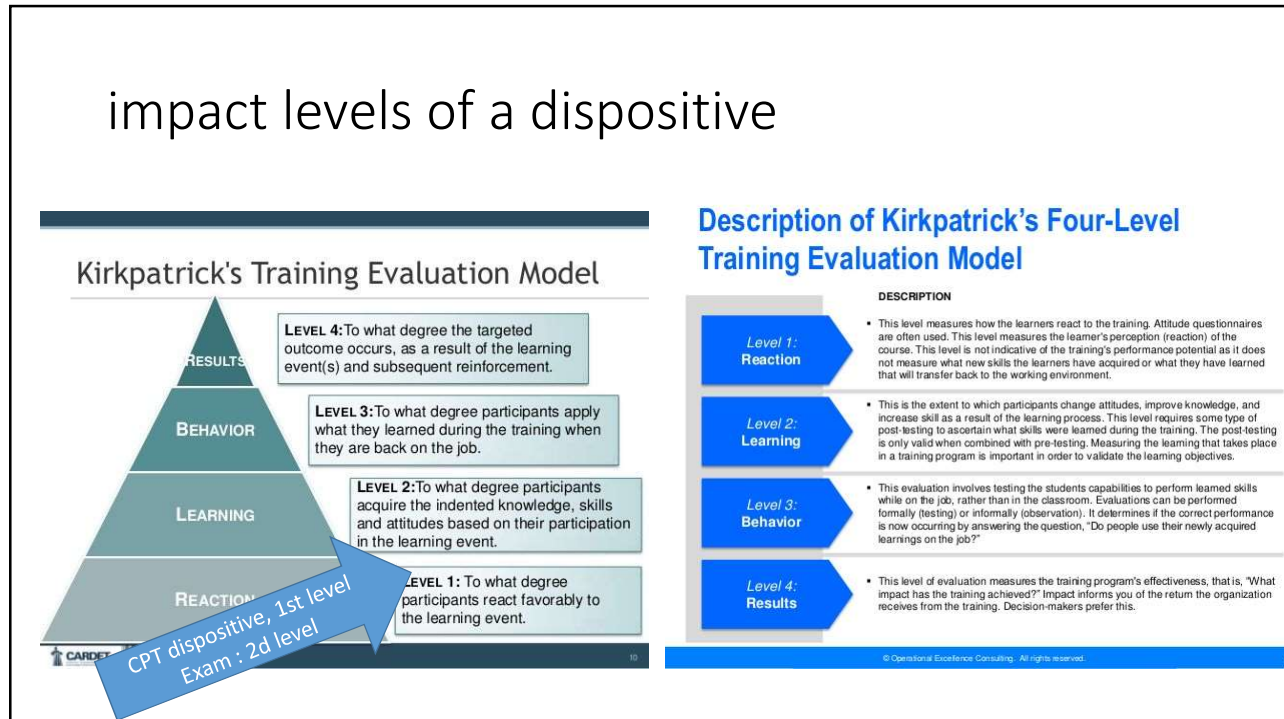
Apprentissage en profondeur

Stimulation de l'autonomie

Respect des styles d'apprentissages des étudiants

Promouvoir la différenciation pédagogique

impact levels of a dispositive



Modules de Thérapeutique 2017-2018: vers la thérapie intégrée

Groupe de travail constitué de R.Radermecker, G. Scantamburlo,
AS Parent, P Emonts, R Louis, JF Brichant, J Petermans, JL Belche

Coordination JL Belche



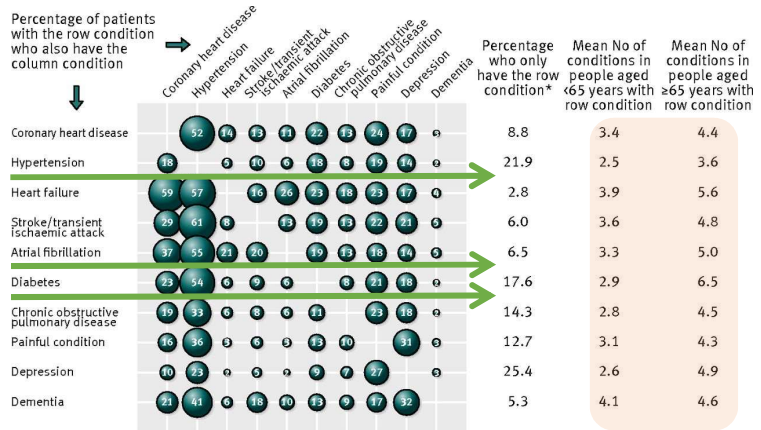
Contexte

Approche/enseignement par maladie

Mais faible prévalence des situations en mono-pathologie ...

La multimorbidité est la règle!

Comorbidity of 10 common conditions among UK primary care patients².



* Percentage who do not have one of 39 other conditions in the full count

Guthrie B et al. BMJ 2012;345:bmj.e6341

©2012 by British Medical Journal Publishing Group

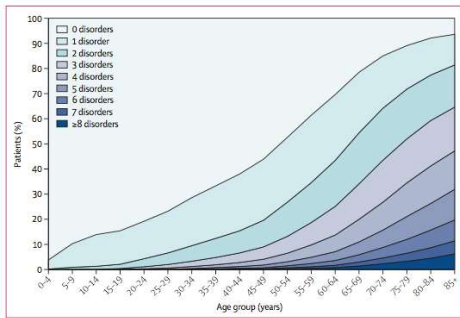


Figure 1: Number of chronic disorders by age-group

Barnett K, Mercer SW, Norbury M, Watt G, Wyke S, Guthrie B. Epidemiology of multimorbidity and implications for health care, research, and medical education: a cross-sectional study. Lancet. 2012;380(9836):37-43.

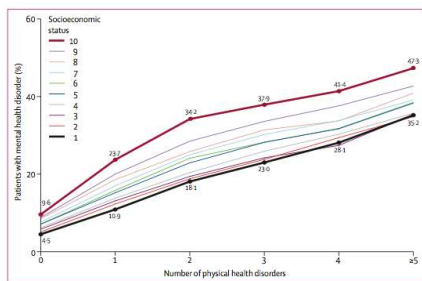
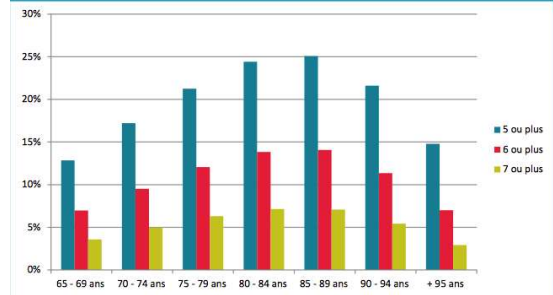


Figure 3: Physical and mental health comorbidity and the association with socioeconomic status. On socioeconomic status scale, 1=most affluent and 10=most deprived.

Graphique 3 - Pourcentage de patients par nombre de médicaments utilisés de manière chronique et par catégorie d'âge (au niveau ATC-3)



Source : Pharmanet, INAMI situation 31.12.2012



Patiente de 79 ans, avec ostéoporose, arthrose, diabète de type 2 contrôlé, HTA modérée, BPCO modérée



- GPC adaptés à Personnes âgées dans 4/15
- 12 médicaments différentes, en 19 prises sur 5 moments de la journée (en plus de salbutamol à la demande et l'alendronate 1x/semaine)
- risques d'interactions médicamenteuses
- 14 activités d'autosoins, dont certaines contradictoires

Boyd CM, Darer J, Boulton C, Fried LP, Boulton L, Wu AW. Clinical practice guidelines and quality of care for older patients with multiple comorbid diseases: implications for pay for performance. JAMA. 2005;294(6):716-24.

Table 3. Treatment Regimen Based on Clinical Practice Guidelines for a Hypothetical 79-Year-Old Woman With Hypertension, Diabetes Mellitus, Osteoporosis, Osteoarthritis, and COPD*

Time	Medications†	Other
7:00 AM	Ipratropium metered dose inhaler 70 mg/wk of alendronate	Check feet Sit upright for 30 min on day when alendronate is taken Check blood sugar
8:00 AM	500 mg of calcium and 200 IU of vitamin D 12.5 mg of hydrochlorothiazide 40 mg of lisinopril 10 mg of glyburide 81 mg of aspirin 850 mg of metformin 250 mg of naproxen 20 mg of omeprazole	Eat breakfast 2.4 g/d 90 mmHg Low intensity cholesterol Adequate Medication DASH††
12:00 PM		Eat lunch 2.4 g/d 90 mmHg Low intensity cholesterol Adequate Medication DASH††
1:00 PM	Ipratropium metered dose inhaler 500 mg of calcium and 200 IU of vitamin D	
7:00 PM	Ipratropium metered dose inhaler 850 mg of metformin 500 mg of calcium and 200 IU of vitamin D 40 mg of lovastatin 250 mg of naproxen	Eat dinner 2.4 g/d 90 mmHg Low intensity cholesterol Adequate Medication DASH††
11:00 PM	Ipratropium metered dose inhaler	
As needed	Albuterol metered dose inhaler	

Table 4. Potential Treatment Interactions for a Hypothetical 79-Year-Old Woman with 5 Chronic Diseases

Type of Disease	Medications With Potential Interactions	Medication and Other Disease	Type of Interaction	Medication and Food
Hypertension	Hydrochlorothiazide, lisinopril	Diabetes: diuretics increase serum glucose and lipids*	Diabetes medications: hydrochlorothiazide may decrease effectiveness of glyburide	NA
Diabetes	Glyburide, metformin, aspirin, and atorvastatin	NA	Osteoarthritis medications: NSAIDs plus aspirin increase risk of bleeding Diabetes medications: glyburide plus aspirin may increase the risk of hypoglycemia; aspirin may decrease effectiveness of lisinopril	Aspirin plus alcohol: increased risk of gastrointestinal tract bleeding Atorvastatin plus grapefruit juice: muscle pain, weakness Glyburide plus alcohol: low blood sugar, flushing, rapid breathing, tachycardia Metformin plus alcohol: extreme weakness and heavy breathing Metformin plus any type of food: medication absorption decreased
Osteoarthritis	NSAIDs	Hypertension: NSAIDs: raise blood pressure†; NSAIDs plus hypertension increase risk of renal failure	Diabetes medications: NSAIDs in combination with aspirin increase risk of bleeding Hypertension medications: NSAIDs decrease efficacy of diuretics	NA
Osteoporosis	Calcium, alendronate	NA	Diabetes medications: calcium may decrease efficacy of aspirin; aspirin plus alendronate can cause upset stomach Osteoporosis medications: calcium may lower serum alendronate level	Alendronate plus calcium: take on empty stomach (>2 h from last meal) Alendronate: avoid orange juice Calcium plus oxalic acid (spinach and cereals): eating these foods may decrease amount of calcium absorbed (>2 h from last meal)
Chronic obstructive pulmonary disease	Short-acting β-agonists	NA	NA	NA

Boyd CM, Darer J, Boulton C, Fried LP, Boulton L, Wu AW. Clinical practice guidelines and quality of care for older patients with multiple comorbid diseases: implications for pay for performance. JAMA. 2005;294(6):716-24.

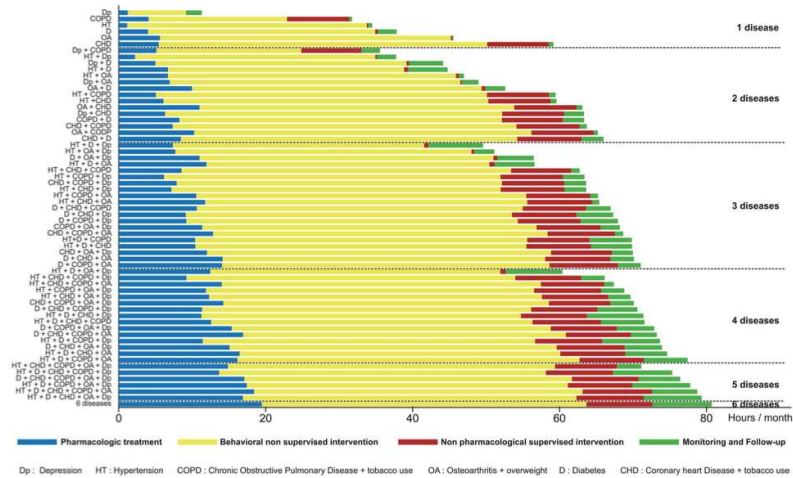


Figure 2 Time spent by patients in health-related activities (hours/month) by activity and multimorbidity profile. CHD, coronary heart disease; COPD, chronic obstructive pulmonary disease; D, diabetes; Dp, depression; HT, hypertension; OA, osteoarthritis.

Buffel du Vaure C, Ravaud P, Baron G, et al. Potential workload in applying clinical practice guidelines for patients with chronic conditions and multimorbidity: a systematic analysis. *BMJ Open* 2016;6: e010119. doi:10.1136/bmjopen-2015-010119

Public et contexte du cours

- étudiants Master 3-dernière année
- tout futur médecin
- dans le cadre des journées de retour
- 6 cours de 4h (jeudi PM)
- d'octobre à mars



Objectif général

Initier une réflexion sur l'acte thérapeutique, médicamenteux ou non, dans des situations courantes, d'un niveau de complexité nécessitant l'intégration de connaissances