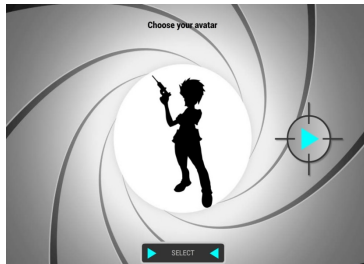


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Learning infection control via games?



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August 10, 2017

The control of HAI is a challenge



- ▣ **Multiple improvement strategies**
 - Educational programmes
 - Performance feedbacks
 - Guidelines
 - Bundles

- ▣ **But difficult to change behaviors and beliefs**

- ▣ **Need for innovative tools!**



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Games?



- ▣ **A serious game** is a game designed for a primary purpose other than pure entertainment
- ▣ **Gamification** is the use of game design elements in non-games contexts making use of the potential ability of games



Cugelman B. *JMIR serious games* 2013/ Abdulla El-Hilly A. *JMIR serious games* 2016/ Wattanasoontorn V. *Entertainment computing* 2013

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Games?



- ▣ **Principles of a game**
 - ▣ Objective + Rules + Means
- ▣ **Why do we play?**
 - ▣ To have fun
 - ▣ To learn and grow
 - ▣ To overcome challenges
 - ▣ To interact with other people



Cugelman B. *JMIR serious games* 2013/ Abdulla El-Hilly A. *JMIR serious games* 2016/ Wattanasoontorn V. *Entertainment computing* 2013

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To gamify the work?



- **Gamification everywhere?**
 - Yes except if
 - The gamification is not adapted
 - If the context in the ward is not open
- **Gamification : yes but only if...**
 - You expect people change their behaviour
 - You can measure their progression
 - You can offer a feedback to players

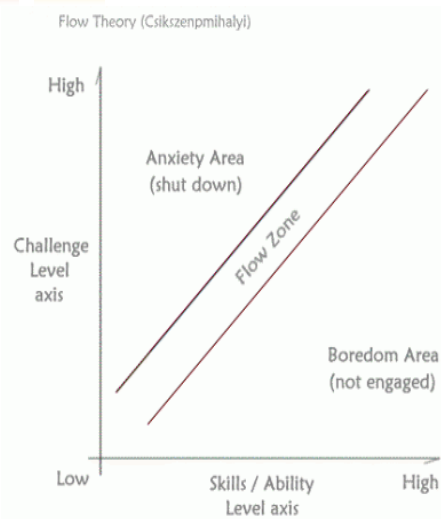
Cugelman B. *JMIR serious games* 2013/ Abdulla El-Hilly A. *JMIR serious games* 2016/ Wattanasoontorn V. *Entertainment computing* 2013

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Games to learn and change behavior?



- **Challenge**
 - Major component of a game
- **Key goal is the FLOW**
 - Absorbed in the task
 - We forget what's around us
 - We forget ourselves
 - Our brain is learning



Csikszentmihalyi M. *The psychology of Optimal Experience*; 2008 Harper *Perennial Modern Classics*

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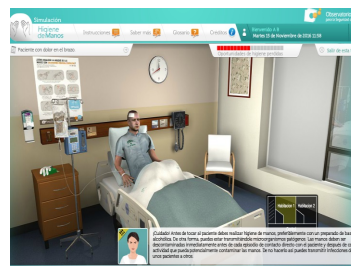
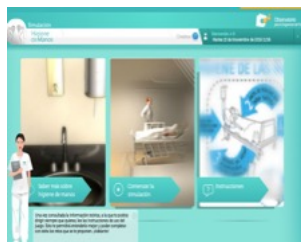
Games for health?

- ▣ Several games exist for healthcare workers or patients
 - Role-playing games, Serious video games
 - Gamification of serious procedures with goals to achieve
- ▣ **Cochrane 2013 review** neither confirmed nor refuted the utility of games as a teaching strategy for health professionals
- ▣ **Literature since 2013**
 - Games for healthcare workers and patients: improve behaviors
 - Games for health students: strongly engaging and stimulating to study longer
 - Methodological aspects could be improved

Akl EA. Cochrane database Syst Rev 2013/ Graafland M. Surg Endosc 2017/ Cook DA. JAMA 2011/ Graafland M. JMIR Serious games 2014/ Dankbaar M. BMC medical education 2017/ Dankbaar M. Perspect Med Educ 2017 7

Serious games for infection control

- ▣ **Games but few papers**
 - Sax and Longtin. BMC Proc, 2011
 - Vasquez-Vasquez et al. SeGAH IEEE, 2011
 - Bertozzi et al. Gaming comput Mediat Simul, 2013
 - Castro-Sanchez et al. CGPIH, 2014
 - Venier et al. ARIC 2015



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Serious games – Cpias Nouvelle Aquitaine experience



- ▣ 2012 ...**Sarcoptes invasion** (scabies)
- ▣ 2013 ...**Flu.0** (Flu)
- ▣ 2014 ...**Dojo résistance** (XDR bacteria)
- ▣ 2015...**Code Name UTI** (urinary tract infection)
- ▣ 2017...**I control** (universal precautions)

https://www.cpias-nouvelle-aquitaine.fr/serious_games/

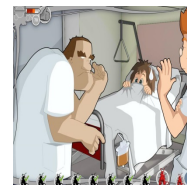
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Serious games – Cpias Nouvelle Aquitaine experience



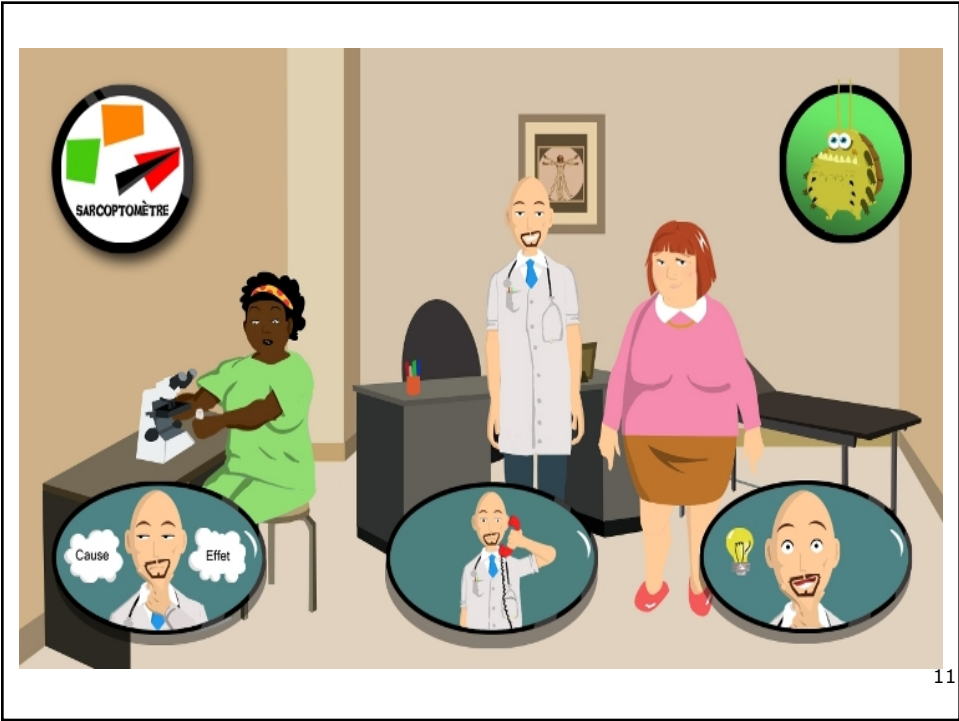
▣ **Main game design**

- French or English-speaking video games
- Free, can be used everywhere, online or downloaded
- Healthcare worker avatar facing 8-9 scenes
 - 8 key point questions
 - 3 possible answers
 - explanation of why the answer is correct or not
- A final score evaluates the player's performance

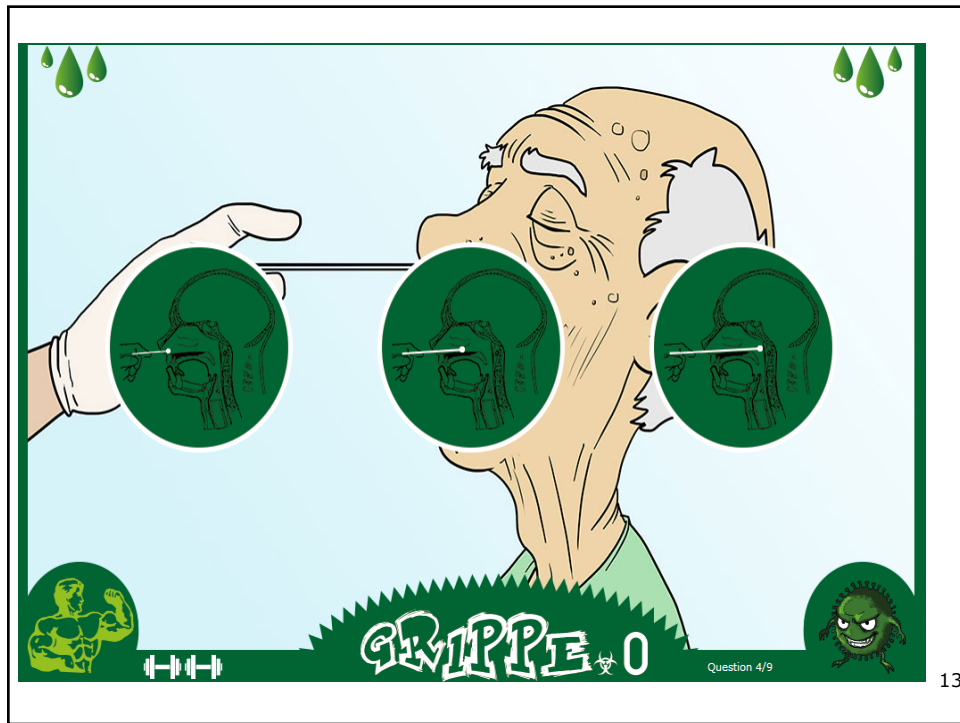


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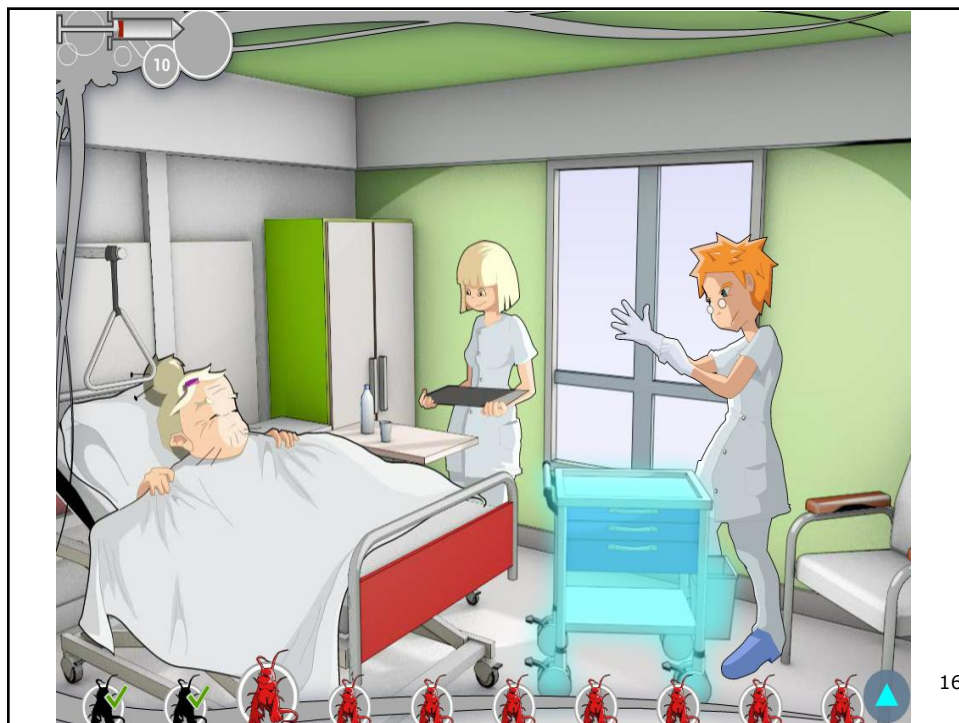
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Does it work? Experience of Cpias NA



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« Flu.0 » Evaluation



- ▣ **Call for participation to play and evaluate the game**

- ▣ **Questionnaire before and after the game**
 - Opinion on sentences about flu
 - What players learnt thanks to the game
 - Rate the game
 - Main thing they would do differently after this game

- ▣ **Descriptive analysis – khi-square test for evolution**

Venier AG. ARIC 2015

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Results



264 physicians (213 fellows), 62 senior nurses, 577 nurse students

Rate given to the game 7.9/10

	Physicians / Senior nurses		Nurse students	
	Before the game	After the game	Before the game	After the game
Seasonal flu = benign disease	156 (48%)	113 (35%)	207 (36%)	68 (12%)
Flu vaccination of health care workers = useful	302 (93%)	322 (99%)	496 (86%)	567 (99%)
I know the indications of the antiviral treatment	201(62%)	280 (86%)	234 (41%)	423 (74%)
I feel well prepared to face a flu case	257 (79%)	309 (95%)	433 (75%)	556 (97%)
Well prepared to perform rapid flu diagnostic test	95 (29%)	280 (86%)	140 (24%)	433 (75%)

p=0.001

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Results



95 % learnt at least one key point

Two key points

52% Physicians, senior nurses

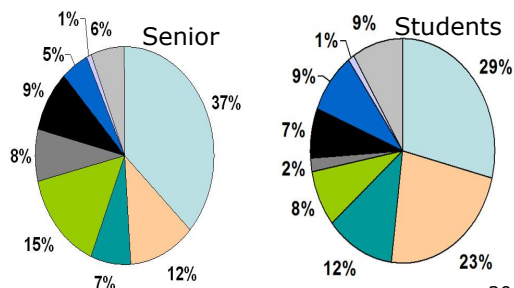
82% Nurse students

Three Key points

16% Physicians, senior nurses

45% Nurse students

- Rapid flu diagnostic test
- Infection control measures
- Interests and limits of vaccination
- Difference between seasonal flu and flu variant
- Antiviral treatment
- Contagiousness
- Diagnosis and symptoms
- Communication
- Other



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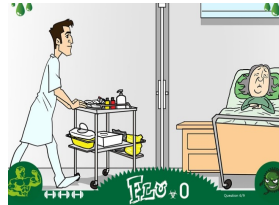
Results



94 % would change their practices after the game

□ Better droplets precautions

- Physicians/ Senior nurses 47%
- Nurse students 80%



□ Better Flu diagnosis

- Physicians/ Senior nurses 17%

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« Code Name UTI » evaluation



□ Two case-control studies

□ Students midwives

- 17 played « Code Name UTI » in a classroom with voting keypads (15 min)
- 16 read a leaflet during 15 min (same keypoints inside)

□ Nurse students

- 295 played « Code Name UTI » / 287 read the leaflet

□ Questionnaire before and after the game

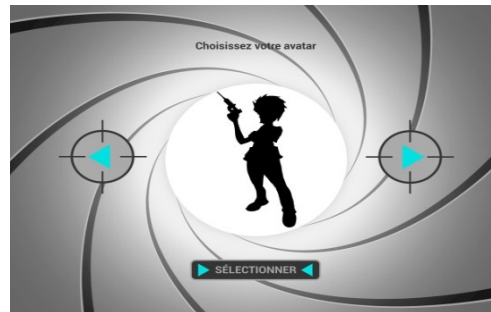
- Same principle as Flu. 0
- Before and after the intervention
- Two months after the intervention for midwives

Astrugue C Venier AG. In submission 22

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Results



Game vs leaflet

- Learnings more specific
- Change of practices more precise
- More prepared to face a patient with a urinary catheter

Astrugue et al, in submission

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So... Does it work?



For students

- Attractive and engaging to learn more
- Helpful to have good practices?

For Health care workers

- Knowledge capitalization
- Engaging for behavior change
- Not time-consuming



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How to use games for infection control



- Check the users' context is ok
- Choose the correct game for the correct population
 - Challenge adapted to the competences (novice/ expert/master)
 - Game aimed to answer to a problem you want to solve



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How to use games for infection control



- Use games!
 - During a learning session, in a multiple tool strategy, for a special day
 - Voting keypads/ Computers/ Smartphone
- Don't be overconfident
 - Games can't exert massive influence across all contexts
 - So... add briefing + debriefing +/- synthetic cognitive information

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Thank you for your attention



Learning infection control via games, does it work? Yes it can!

So why go without it?



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August 24, 2017	<i>(FREE Teleclass)</i> SOCIAL MEDIA: USELESS OR USEFUL IN INFECTION PREVENTION? Speaker: Barley Chironda , IPAC Canada
September 14, 2017	RELATIONSHIP BETWEEN PATIENT SAFETY CLIMATE AND ADHERENCE TO STANDARD PRECAUTIONS Speaker: Dr. Amanda Hessels , Ann May Center for Nursing, Columbia University
September 18, 2017	<i>(FREE European Teleclass - Broadcast live from the 2017 IPS conference)</i> Cottrell Lecture ... IGNITING PASSION, SPARKING IMPROVEMENT Speaker: Julie Storr , World Health Organization
September 20, 2017	<i>(FREE European Teleclass - Broadcast live from the 2017 IPS conference)</i> Ayliffe Lecture ... TOP TEN PEARLS FOR SUCCESS IN INFECTION PREVENTION (& LIFE) Speaker: Prof. Sanjay Saint , University of Michigan Medical School
September 28, 2017	HOW TO PUBLISH IN THE JOURNALS AND WHY IT MATTERS Speaker: Prof. Elaine Larson , Columbia University, Mailman School of Public Health
October 5, 2017	<i>(FREE Teleclass)</i> INFECTION CONTROL GUIDELINES THAT DID NOT WORK AGAINST EBOLA Speaker: Prof. Bjørg Marit Andersen , Oslo University Hospital

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