

Adaptation d'outils d'Aide à la Décision Américains pour réduire la surutilisation de la TDM cérébrale pour les traumatismes crâniens légers

Une réunion de consensus canadien utilisant Technique du Groupe Nominal

COLLABORATION • CRÉATIVITÉ • INTÉGRITÉ • RESPECT • RESPONSABILITÉ SOCIALE

LA SANTÉ DURABLE NOTRE ENGAGEMENT POUR LA VIE



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Remerciements

Fonds de recherche
Santé

Québec 



CTRC

Canadian Traumatic Brain Injury
Research Consortium

Centre intégré
de santé et de services
sociaux de Chaudière-
Appalaches

Québec 

Edward Melnick, Erik Hess, Catherine Truchon, Maude Donne, Rebecca Francois, Jocelyn Gravel, Janet Curran, Sasha Dubrovsky, Annie LeBlanc, Marie-pierre Gagnon, Natalie Le Sage, Marie-Christine Ouellet, Jeff Perry, Eddy Lang, Sasha Dubrovsky, Lania Lelaidier-Hould, et trois patient partenaires: Suzanne McKenna, Édouard Botton and Roxan Dionne.

Aucun conflit d'intérêt

Plan

- Introduction
- CTRC Canadian Head CT Patient Decision Aid Consensus Study
 - Objectifs
 - Méthode
 - Résultats
- Étapes suivantes
- Conclusion

TDM pour TCCL

- Incertitude +++
 - Bénéfices vs Risques
- Règles de décision clinique
 - Lignes directrices cliniques
 - Fondées sur des données probantes
 - Rigoureusement validés
 - Adults: The Canadian CT Head Rule (Stiell et al., 2001)
 - Enfants: PECARN (Kuppermann et al, 2009)



Canadian CT Head Rule
CT head is only required for moderate head injury patients with any one of these findings:

High Risk (for Neurological Intervention)

1. GCS score = 15 at 2 hrs after injury
2. Suspected open or depressed skull fracture
3. Any sign of basal skull fracture*
4. Vomiting ≥ 2 episodes
5. Age ≥ 65 years

Medium Risk (for Brain Injury on CT)

6. Amnesia before impact ≥ 30 min
7. Dangerous mechanism ** (pedestrian, occupant ejected, fall from elevation)

*Signs of Basal Skull Fracture:
- Periorbital, periorbital, eye, CSF otorrhea/rhinorrhea, Battle's sign

** Dangerous Mechanism:
- Pedestrian struck by vehicle
- Occupant ejected ≥ 2 feet or 6 users
- Fall from elevation ≥ 2 feet or 6 users

*** Not Test Applicable if:
- Non-trauma cause
- GCS = 15
- Age < 16 years
- Observed head injury
- Observed skull fracture

Pediatric Head Trauma CT Decision Guide
Children younger than 2 years

UNDER 2 YEARS

High Risk - 4.4% risk of c-TBI*

- GCS < 15
- Palpable skull fracture
- AMS (agitation, somnolence, slow response, repetitive questioning)

Intermediate Risk - 0.9%

- Scalp hematoma (excluding frontal)
- LOC > 5 seconds
- Not acting normally per parent
- Severe mechanism of injury
 - Fall > 3 ft
 - MVA w/ejection, rollover, or fatality
 - Bike/ped vs. vehicle w/o helmet
 - Struck by high-impact object

YES TO ANY → Observation vs. CT using shared decision-making

NO → CT not indicated, Observe

Low Risk - < 0.02%

Clinical factors used to guide decision-making:
 • Multiple vs. isolated factors
 • Worsening findings during observation (AMS, headache, vomiting)
 • Physician experience
 • Parental preference
 • < 3 months old

*c-TBI: risk of clinically important TBI needing acute intervention, based on PECARN validated prediction rules

Pediatric Head Trauma CT Decision Guide
Children 2 years and older

2 YEARS & OLDER

High Risk - 4.3% risk of c-TBI*

- GCS < 15
- Signs of basilar skull fracture
- AMS (agitation, somnolence, slow response, repetitive questions)

Intermediate Risk - 0.9%

- Vomiting
- LOC
- Severe headache
- Severe mechanism of injury
 - Fall > 3 ft
 - MVA w/ejection, rollover, or fatality
 - Bike/ped vs. vehicle w/o helmet
 - Struck by high-impact object

YES TO ANY → Observation vs. CT using shared decision-making

NO → CT not indicated, Observe

Low Risk - < 0.05%

Clinical factors used to guide decision-making:
 • Multiple vs. isolated factors
 • Worsening findings during observation (AMS, headache, vomiting)
 • Physician experience
 • Parental preference

*c-TBI: risk of clinically important TBI needing acute intervention, based on PECARN validated prediction rules

TDM cérébrale TCCL, Un Standard

- Au Canada
 - 10 - 43 % des TCCL, TDM inappropriées (Stiell et al., 2007; Sharp et al., 2017)
- Au Québec
 - **SPOC Le Sage et al., adultes (NP)**
 - 63% des (539/849) TCCL ont eu TDM cérébrale
 - ↗ taux de surutilisation /années
 - **Gariepy et al., Pédiatrie (Poster 32)**
 - Pas de surutilisation
 - Sous-utilisation (TCS ou M)

2005-2008: 36%

2010-2013: 41%

2013-2016: 47%

TDM pour TCCL, Surutilisation (Overuse)

- La règle canadienne pour le TDM cérébral (CCTHR)
 - Sensible: TCS (100%) ou TCM (98%)
 - TCCL, ↗ TDM par 13%
- Influences sociales (Curran et coll., 2013; Melnick et coll., 2015b)
 - **Caractéristiques & Relation Patients / prestataires de soins**
 - **Contexte des urgences**
- Manque de participation / implication des patients (Melnick et coll., 2015b)

Table 1
Clinical Scenarios in Which SDM May Be Appropriate

Specific Scenarios	Published and Ongoing Research
Low-risk chest pain: disposition*	Studied in a single center and recently completed multicenter trial ^{4,5}
Low-risk head trauma: imaging* Stroke: tPA*	Currently under investigation ^{6,8} Qualitative work, ¹⁴ development of decision aid ^{15,16}
End-of-life care	ICU intervention under investigation ¹⁷
Suspected renal colic: imaging*	
Acute otitis media: treatment LP after negative head CT for SAH*	In development
Pain medication choice upon discharge CTPA after low-positive D-dimer*	Observational study ¹⁸ Hypothetical study ¹⁹
Syncope: disposition* Stable PE patient: disposition*	Qualitative work ²⁰
Stable community acquired pneumonia: disposition* Management of well-appearing febrile infants < 2 mo of age Bronchiolitis: disposition CT for diverticulitis	
Analgesic selection/opiate prescribing	Qualitative work, ²¹ prospective observational studies ¹⁸
Antibiotics for URIs	Mixed methods study under investigation ²²

*Indicates endorsement as appropriate "all" or "most of the time" by a majority of EM physicians in a recent survey.¹²
CT = computed tomography; CTPA = computed tomography pulmonary angiography; ICU = intensive care unit; LP = lumbar puncture; SAH = subarachnoid hemorrhage; SDM = shared decision making; PE = pulmonary embolism; tPA = tissue plasminogen activator; URIs = upper respiratory infections.

Prise de Décision Partagée (PDP)

- Processus PDP peut aider à réduire la surutilisation TDM
 - (Melnick et al., 2015b)
- Surutilisation TDM : l'un des scénarios cliniques les plus appropriés à la PDP aux urgences
 - (Stacey et coll., 2017)
- **Outils d'Aides la décision (OAD) pour les patients (*Patient Decision Aids*)**

Étude de consensus canadien sur les outils d'aide à la décision partagée pour faire une TDM cérébrales pour TCCL

CTRC Canadian Head CT Patient Decision Aid Consensus Study

CTRC Consensus Meeting Quebec City May 25, 2017

Objectifs

- Identifier les changements à apporter aux deux OAD sur l'utilisation de TDM cérébrale pour TCCL
 - Outil pédiatrique (Hess et coll., 2014)
 - Outil adulte (Melnick et coll., 2015)
- Une réunion d'experts d'une journée à Québec

The Canadian Head CT Patient Decision Aid Consensus Study

Adaptation of two decision aids supporting adult and pediatric mild traumatic brain injury patients' decisions about head CTs: a pan-Canadian consensus meeting and rapid prototyping with input from an expert panel to produce Canadian versions of two American head CT decision aids



Consensus meeting
Quebec City

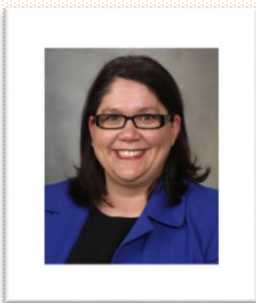
ALT HOTEL QUEBEC
May 25TH, 2017

Étude de consensus canadien sur les outils d'aide à la décision partagée pour faire une TDM cérébrale

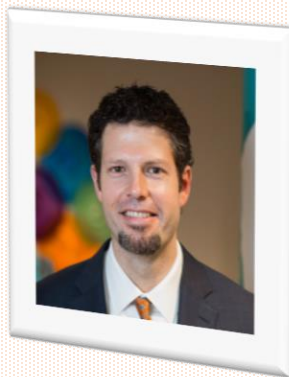
Adaptation de deux outils américains d'aide à la décision partagée sur la décision de faire une tomodensitométrie (TDM) cérébrale chez les victimes adultes et pédiatriques d'un traumatisme craniocérébral léger (TCCL) au contexte canadien : réunion de consensus pancanadien et prototypage rapide supporté par un panel expert

Pediatric Head CT Choice

- Parents d'enfants avec TCCL (3 pages)
 - (Hess et al., 2014)
 - Mayo Clinic, Rochester, Minnesota



Annie LeBlanc, PhD



Erik Hess, MD

Concussion

Brain movement within the skull

- Symptoms may include headache, nausea, dizziness, or difficulty concentrating
- Symptoms should resolve in several days to a few months
- Recovery is almost always complete
- Cannot be seen on a CT scan

Brain Injury

Blood

In 100 children with minor head injury similar to your child:
1 will have brain injury and 99 will not

- Occurs when the head injury is severe enough to cause bleeding in or around the brain
- May require medical intervention such as a stay in the hospital or surgical procedure

Kusumam et al., Lancet, 2009

After monitoring your child in the emergency department for a period of time, we will find out if there is any serious bleeding in or around the brain with:

HEAD CT SCAN

You can have a head CT scan test done to determine if your child has had a brain injury.

OBSERVATION AT HOME

If your child's symptoms are the same or better in the next 1-2 days, then there was no serious bleeding in or around the brain.

It is very unlikely, but if your child develops now or worsening symptoms such as these, bring him/her back to the Emergency Department as soon as possible.

Lack of alertness (if they are becoming less and less alert within the next day)

Vomiting (enough episodes to interfere with eating)

Severely worsening headache (despite resting)

Difficulty talking or recognizing people

Unsteady or cannot walk

Your child can maintain regular activities such as sleep.

Please circle the issues that are most important to you and your child.

	SPEED OF DIAGNOSIS	RADIATION	SEDATION	COST	POTENTIAL DOWNSIDES	WAIT IN ED
HEAD CT SCAN 	Now	Yes	Possible	May increase cost depending on your coverage	May find irrelevant things that lead to more tests	Typically longer
OBSERVATION AT HOME 	Delayed	No	No	No added cost	Potential return to ED if symptoms worsen	Typically shorter

Pediatric Head CT Choice

- (Hess et al., 2014)
 - Mayo Clinic, Rochester, Minnesota



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Brain Injury

Blood

In 100 children with minor head injury similar to your child:
1 will have brain injury and 99 will not

Requena et al., Lancet, 2008

After monitoring your child in the emergency department for a period of time, we will find out if there is any serious bleeding in or around the brain with:

HEAD CT SCAN

You can have a head CT scan test done to determine if your child has had a brain injury.

OBSERVATION AT HOME

If your child's symptoms are the same or better in the next 3-5 days, then there was no serious bleeding in or around the brain.

It is very unlikely, but if your child develops new or worsening symptoms such as those, bring him/her back to the Emergency Department as soon as possible.

Lack of alertness if they are becoming less and less alert within the next day)

Severe or worsening headache (despite rest)

Worsening through eye exams with swelling

Unusually or cannot wake

Difficulty talking or recognizing people

Your child can maintain regular activities such as always.

Please circle the issues that are most important to you and your child.


	SPEED OF DIAGNOSIS	RADIATION	SEDATION	COST	POTENTIAL DOWNSIDES	WAIT IN ED
HEAD CT SCAN 	Now	Yes	Possible	May increase cost depending on your coverage	May find irrelevant things that lead to more tests	Typically longer
OBSERVATION AT HOME 	Delayed	No	No	No added cost	Potential return to ED if symptoms worsen	Typically shorter

After discussing this together, we want to do:

- HEAD CT SCAN
 OBSERVATION AT HOME
- Let the Emergency Department doctor decide what to do next

You will have the opportunity to revisit this decision with your doctor while you are in the Emergency Department.

Adult Head CT Choice



Concussion or Brain Bleed?

Let's talk about how we tell the difference.

IMPORTANT NOTE

This decision tool is designed for use with people who...

- DO NOT have a bleeding disorder
- DO NOT use a prescription strength blood thinner (No aspirin)
- DO NOT have a seizure after their injury

CONCUSION OR BRAIN BLEED?

How serious is the injury?
Based on the Canadian CT Head Rule¹

The patient had...

- GCS < 15 at 2 hours post-injury
- Suspected open or depressed skull fracture
- Any sign of basilar skull fracture (Periorbital bruising, raccoon eyes, Battle's sign, CSF otorrhea/rhinorrhea)
- ≥ 2 episodes of vomiting
- Age ≥ 65

- Retrograde amnesia ≥ 30 minutes
- Injury involved a "dangerous" mechanism, e.g.
 - pedestrian struck by motor vehicle
 - Occupant ejected from motor vehicle
 - Fall from > 3 feet or > 3 stairs

- an absence of medium or high risk criteria

HIGH RISK **MEDIUM RISK** **LOW RISK**

*This tool has been validated in over 11,000 patients and found to be 100% accurate in predicting need for surgery.

- Adultes / Dyade patient-MD
 - Tablette
 - (Melnick et al., 2015)
- Yale School of Medicine, Yale University;
New Haven, Connecticut

CONCUSION OR BRAIN BLEED?

YOUR INJURY IS LOW RISK.

This means that the current risk of finding a brain bleed on CT scan for 100 people like you is...

97 people will not have a finding of brain bleed on CT scan

3 people will have a brain injury seen on CT scan which may or may not be a brain bleed

- 1 person would have their care plan changed (e.g. staying in the hospital longer)
- 0 people will have a finding that requires surgery or some other invasive procedure



CONCUSION OR BRAIN BLEED?


With a **LOW RISK** injury, the best evidence **DOES NOT** support getting a CT scan for your injury.

What you likely have is a concussion.

A concussion can happen when the brain moves around in the skull.

A concussion is not a brain bleed and you cannot see a concussion.

Concussions do not show up on CT scan. Brain bleeds do.



Are you surprised that you can't see concussion on CT scan?

How comfortable do you feel not getting a CT scan?

What are you most concerned about?

CONCUSION OR BRAIN BLEED?

What to expect after leaving the Emergency Department

SYMPTOMS OF CONCUSSION

- "Not feeling right" or feeling dazed
- Headache
- Nausea
- Balance problems or dizziness
- Blurry vision
- Confusion, concentration or memory problems

DANGER SIGNS OF BRAIN BLEED (some task to ED)

- One pupil larger than the other
- Drowsiness or inability to wake up
- A headache that gets worse and does not go away
- Slurred speech, weakness, numbness, or decreased coordination
- Repeated vomiting or nausea, convulsions or seizures (shaking or rattling)
- Unusual behavior, increased confusion, restlessness, or agitation.

DURATION

Symptoms usually go away completely in several days to 3 months though 10-30% of people with concussion have symptoms that last longer.

LET THE BRAIN HEAL

- Rest
- Avoid activities that could cause another injury (repeat injuries can be more serious)
- Once you have recovered, remember to wear a helmet
- Do not drink alcohol!

FOLLOW-UP

You can follow up with your doctor or a concussion specialist to decide when it is safe to return to normal activities and if additional treatment might help you.

Clinicians - Review decision and prepare EHR note

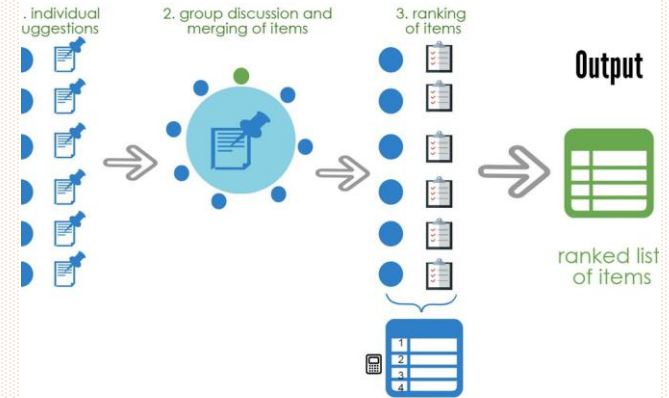


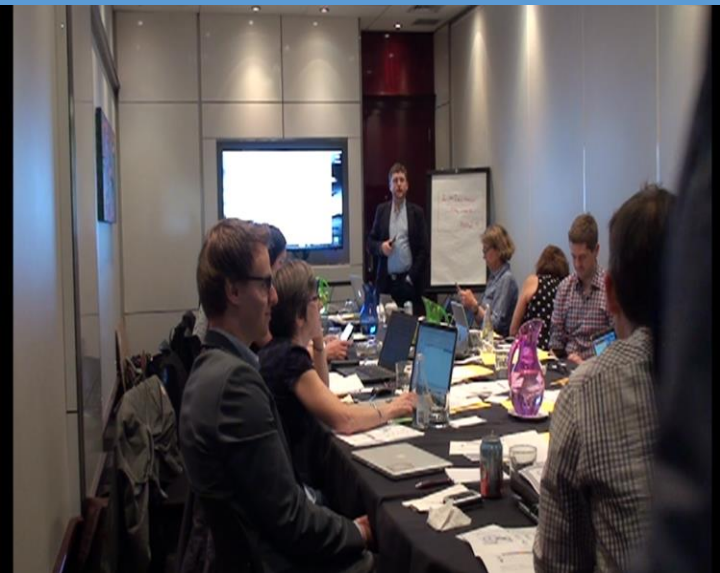
Méthode, Nominal Group Technique (NGT)

- *Consensus development method*
“The Nominal Group technique is a structured face-to-face group session with the purpose of achieving group consensus and action planning on a chosen topic”
- Six étapes



Nominal Group Technique





Nominal Group Technique, Questions

1

What changes should be made to the proposed American decision support tool in order to adapt it for adult mTBI patients in Canadian EDs?

2

What changes should be made to the proposed American decision aid in order to adapt it for use in the context of pediatric mTBI patients in Canadian EDs?

3

Should MDs engage in shared decision making with medium risk adult patients?



Rencontre de consensus, Participants

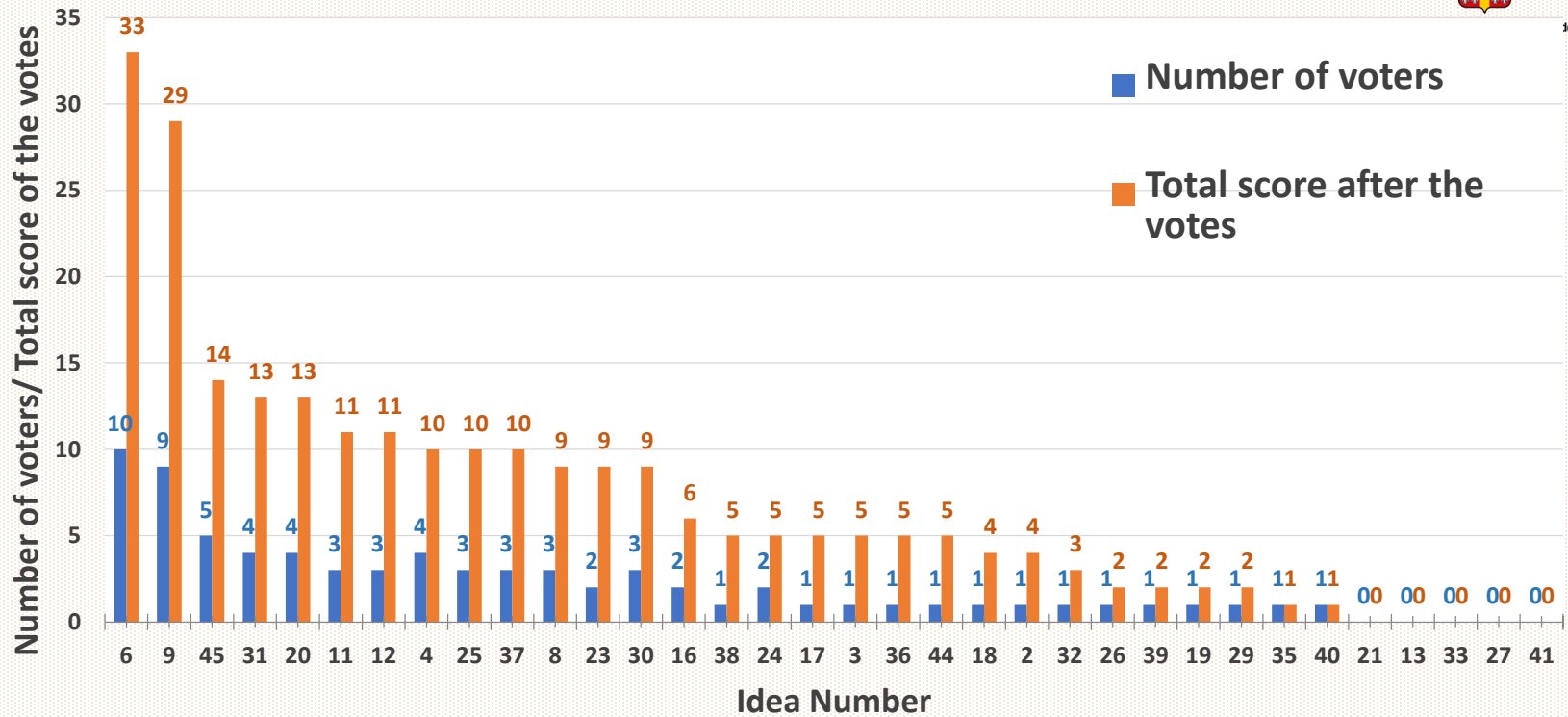
21 Participants

- 18 En personne / 3 via vidéoconférence
- 8 Universités
- 3 Patients partenaires
- 1 Décideur
- 3 Étudiants gradués

Quelques résultats

- Un total of **83** idées générées
 - 45 pour outil Adulte
 - 38 pour l'outil pédiatrique
- 15 considérations importantes avant le vote pour la 3^{ème} question: engagement des patients en PDP pour le risque modéré





Exemple de résultats de vote,
Question 1 (Outil Adulte)

Modifications suggérées

Plus de clarifications / explications

Plus de précisions

Retirer/ ajouter des informations

Changement dans les libellés de phrases (Wording)

Changement dans le support visuel

Exemples de modifications

Changement de titre

- Clarifier l'objectif de l'outil d'aide par le titre
 - "Do you need a CAT scan NOW?"
- Par,
- "Should I have a CAT scan?"

Exemples de modifications

Changer: "are you worried about brain bleed?"

- Expliquer au lieu de demander
 - Saignement cérébral
- « Bien sûr, vous êtes inquiet au sujet d'un saignement du cerveau ! »

Retirer: "Cost considerations" "not clinically important"

- Différences Canada / États-Unis
- Système
- Contexte médico-légal
 - Pas pertinent **les lésions non cliniquement importantes** sur la TDM au Canada

YOUR INJURY IS LOW RISK.

This means that the current risk of finding a brain bleed on CT scan for 100 people like you is...



97 people will not have a finding of brain bleed on CT scan



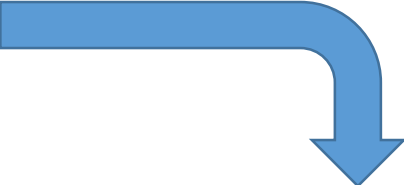
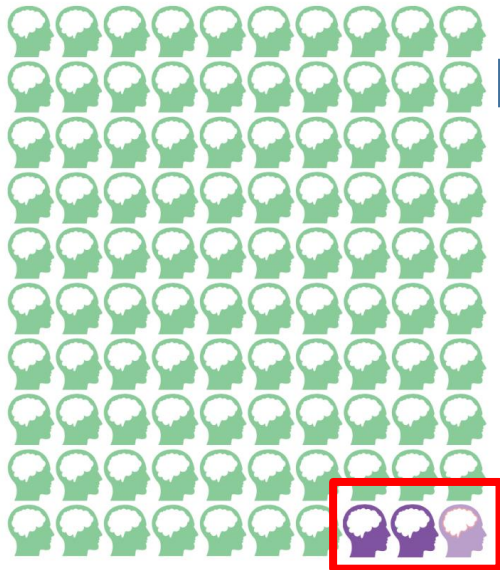
3 people will have a brain injury seen on CT scan which may or may not be a brain bleed



→ **1** person would have their care plan changed (e.g. staying in the hospital longer)



→ **0** people will have a finding that requires surgery or some other invasive procedure



VOTRE TRAUMATISME EST À FAIBLE RISQUE

Cela veut dire que le risque actuel de trouver un saignement intracrânien avec la TDM cérébrale dans 100 patients comme vous est...



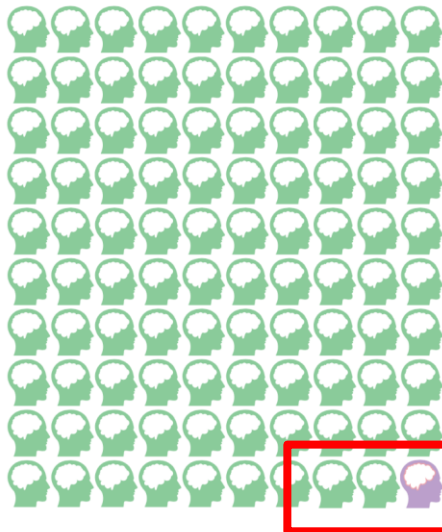
99 personnes n'auront pas de saignement intracrânien à la TDM cérébrale



1 personne aurait une lésion au cerveau vue sur la TDM cérébrale qui peut être ou ne pas être un saignement intracrânien



0 personne aurait un changement dans son plan de traitement (p.ex. rester plus longtemps à l'hôpital)



Exemples de modifications

Suites,

- Traduction / Design (**terminés**)
- Prototypage dans le contexte de trois services d'urgence pédiatriques et adultes au Québec
 - CHU Ste-Justine (Montréal),
 - CHU de Québec-Enfant-Jésus (ville de Québec)
 - CISSS Chaudière-Appalaches (Lévis) (**en cours**)
- Créer un programme de formation sur PD pour les outils adaptés
- Implantation / Évaluation outils adaptés
 - Impact sur la prise de décision concernant la TDM pour TCCL (étude post)

Conclusion

NGT a représenté une méthode pratique/ pertinente pour l'adaptation des deux OAD

- Nombre important de suggestions
- Peu de temps (une journée)
- Multiple perspectives : experts et patients
- Peu exigeantes
 - Ressources / logistique / Analyses
- Résultats immédiats/ Utilisables/ / Priorités



Pas sûr !!!!

D'accord ??



Ted Melnick @Ted_Melnick · May 25

Replying to @Annie_LeBlanc @patarchambault and 3 others

It was a pleasure sharing our work with the Canadian group to adapt our decision tools for use in Canada jmir.org/2017/5/e174/ pic.twitter.com/3B7s7IY40D



1



3



3



CTRC

Canadian Traumatic Brain Injury Research Consortium



Questions ??

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