Fitness-to-Drive

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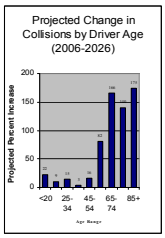
Conflict of interests

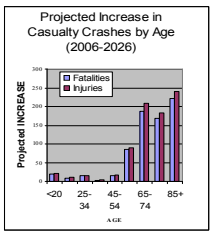
- None
  - No Pharmaceutical Industry support
  - More relevant to driving – no Automotive Insurance Industry support

Objectives

- To describe the scope of the problem of unfit drivers that will impact on the medical system
- To highlight the limitations and complexity of the assessment of fitness to drive
- To provide practical approaches for assessing fitness to drive in persons with dementia

Projections





Source: L'Écuyer et al. (2006). Transport Canada

A Major Public Health Concern

- When involved in a crash, seniors are over 4 times more likely to be seriously injured and hospitalized than are drivers 16-24 years of age.
- Treatment of injuries to seniors is more costly, recovery slower, less complete.
- Most (3 of 4) crashes involving older drivers are multiple vehicle crashes.

Assessment of Fitness-to-Drive

The Complexity of the Medical Driving Evaluation

It is Not Age

- Medical conditions and medications are the primary cause of declines in older driver competence.
  - Can make even the best of drivers unsafe to drive.
  - Can affect drivers of any age: Increasingly likely as we age.
- Not presence but severity and/or instability of conditions +/- high doses and/or changing doses of medications
- Medical community best placed to first recognize possibly impairing medical conditions.

Medical Conditions

Any medical condition or medication that results in a change of physical, sensory, mental or emotional abilities has the potential to compromise driving performance.

Physical: weakness; slow / limited movement

Sensory: vision loss; limited feeling in limbs

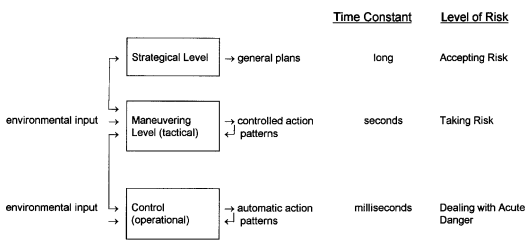
Cognitive/Perceptual: slowed thinking; decreased attention

Emotional: anxiety, panic reactions

Hierarchical Model of Driving

Factors Involved in Driving

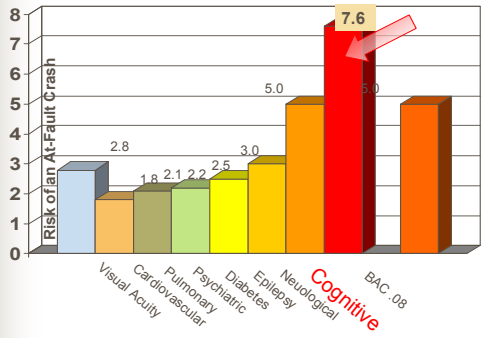
Hierarchical Control Levels in Driving



Realistic Conclusions

- No screening or assessment protocol will ever predict 100% of risk of MVC
  - Only test stable intrinsic features
    - operational > tactical, strategic
    - Miss new or fluctuating illness
  - Cannot predict extrinsic factors
    - weather, other drivers, road conditions, car …
  - Full complexity cannot be fully addressed with time available in front-line clinical settings
- Therefore objective is *to improve* not to perfect the assessment of fitness to drive

Increased Risk of an At-Fault Crash

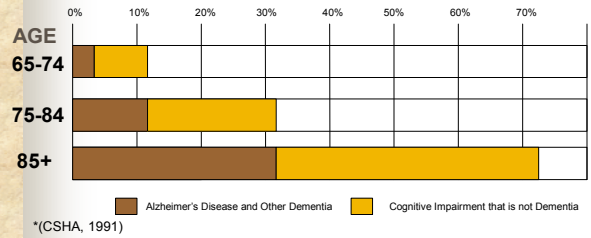


Assessment of Fitness-to-Drive

DEMENTIA & DRIVING

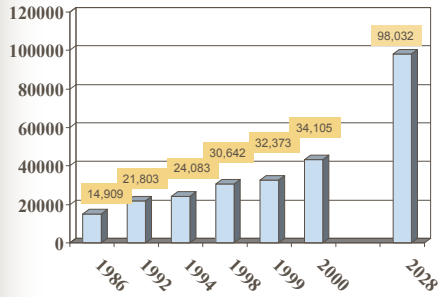
The Facts

Prevalence of Cognitive Impairment*



*(CSHA, 1991)

Estimated Numbers of Drivers with Dementia in Ontario[1]



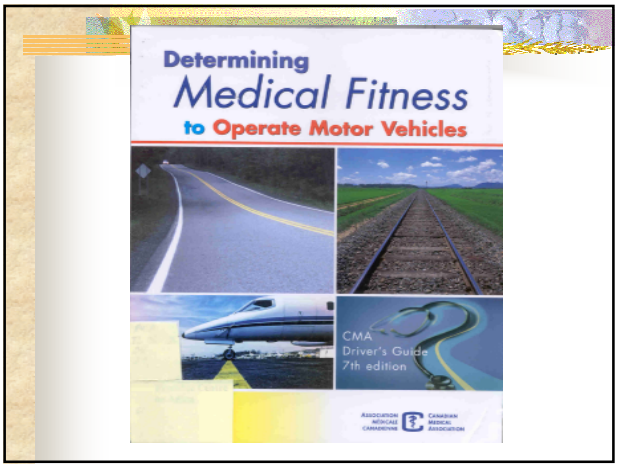
[1] from Hopkins, et al., (2004)

BUT

- The diagnosis of dementia does *not* automatically mean *no driving*
- The diagnosis of dementia *does mean*:
  - You must ask if the person is still driving
  - You must assess and document driving safety and follow your provincial reporting requirements

Dementia and Driving

- Consensus statements
  - Swedish (1997)
  - Australian Geriatrics Society (2001)
  - American Academy of Neurologists (2000)
  - AMA and Canadian Medical Association guidelines



Dementia and Driving

- Conclusions of Consensus statements (cont)
  - Recognize limitations of data
    - those with moderate to severe dementia should not drive (CMA: Moderate = 1 ADL or 2 iADLs impaired due to cognition)
    - individual assessment for those with mild dementia
    - periodic follow-up is required (every 6 - 9 months)
    - "gold standard" is comprehensive on-road assessment

Expert / Consensus Guidelines

- Limitations of Guidelines
  - Based on expert opinion recommend tests such as MMSE, Clock Drawing, Trails B
  - Do not provide guidance regarding HOW physicians are to apply such tests (e.g. how to respond to different scores, what cut-offs to use, errors = automatic failure …)
    - Operating instructions missing

Lack of evidence-based screens

- Clinical Utility of Office-Based Cognitive Predictors of Fitness to Drive in Persons with Dementia: A Systematic Review.
  (Molnar, Marshall, Man-Son-Hing et al., JAGS 2006; 54:1809–1824)
  - No cognitive tests that could potentially be used in an office-setting had cut-off scores validated in persons with dementia!

DEMENTIA & DRIVING

Approach based on clinical acumen

(based on the work of and discussions with numerous Family Physicians, Geriatricians, Neurologists)

Dementia and Driving

- **Start by asking older patients if they drive!**
  - Seems simple but most MDs do not ask (too busy, fear of opening Pandora's box... Lack of awareness does not provide legal protection)
- Keep in mind that driving capacity depends on a **GLOBAL CLINICAL PICTURE**:
  - including cognition, function, physical abilities, medical conditions, behavior, driving record ….
  - Therefore, the following approach will move from general questions ⇒ specific cognitive tests.

Ask Family - Signs of a Potential Problem

- Collisions and/or damage to the car
- Getting lost
- Near-misses with vehicles, pedestrians
- Confusing the gas and brake
- Traffic tickets
- Missing stop signs/lights; stopping for green light
- Deferring right of way
- Not observing during lane changes/ merging
- Others honking/irritated with the driver
- Needing a co-pilot
- New dents in Car

Five Questions to Ask the Person

Yes	No	Question
☐	☐	1. Are you feeling less confident about driving?
☐	☐	2. In the last year, have you had any accidents or near misses or tickets for traffic violations (driving too slowly / failing to stop)?
☐	☐	3. In the last year, have you restricted your driving habits driving less or only on familiar routes, or avoiding driving at night, in bad weather or on busy streets?
☐	☐	4. Have you ever become lost while driving or forgotten where you were going?
☐	☐	5. At the present, do you feel that you are a safe driver?

Five Questions to Ask the Family

Yes	No	Question
☐	☐	1. Do you or would you feel uncomfortable being a passenger when the person is driving?
☐	☐	2. In the last year has the person had any accidents or near misses or tickets for traffic violations (driving too slowly, failure to stop)?
☐	☐	3. Have you noticed the person self-restricting their driving habits driving less or only familiar routes, or avoiding driving at night, in bad weather, or on busy streets?
☐	☐	4. Have other friends or your son or daughter ever expressed concern about the person's driving? Are cues/directions ever needed from you as a "copilot"?
☐	☐	5. (To a son or daughter if they have children) Would you feel it was safe if your son/daughter were in a car driving alone with their grand parent?

Review functions required for driving (would you get in a car with them based on these findings?)

- Cognition
  - vigilance, attention, judgment, insight, planning skills
- Vision
  - visual acuity, depth perception, visual scanning, dynamic acuity, visual fields, night vision, glare accommodation, contrast sensitivity
- Hearing?
- Motor Skills
  - power, coordination, and range of motion of neck and limbs (adequate to operate car?)
- Sensation (can they feel the gas / brake pedals?)

Review medical conditions that when severe, poorly controlled or changing rapidly can impact on driving
(would you get in a car with them based on these findings?)

- 3Ds: Dementia / Delirium / Depression
- Diabetes
- vision and hearing
- cardiac disease
- Stroke
- Parkinson's
- Arthritis
- Sleep apnea

Review Medications that may affect driving (especially high doses or changing doses)

- alcohol
- benzodiazepines
- muscle relaxants
- sedating antidepressants and antihistamines
- anticonvulsants
- anticholinergics (next slide)

Reference List of Drugs with Anticholinergic Effects

- Antidepressants
- Antipsychotics
- Antihistamines/ Antipruritics
- Antiparkinsonian
- Antispasmotics
- Antiemetics

Miscellaneous

Flexeril
Lomotil
Rythmodan
Tagamet
Digoxin
Lasix

The medications in the miscellaneous category have been shown to have anticholinergic properties by radioimmunoassay but are less anticholinergic than the other medications listed. However, they may add to total anticholinergic load.

Focused Cognitive Assessment

- Many patients will be more comfortable with the idea of driving cessation if the decision is made for physical reasons (e.g. loss of vision, syncope etc.)
- If you have not found a non-cognitive (physical) reason, the proceed to cognitive assessment

General Functional Overview

Severity:

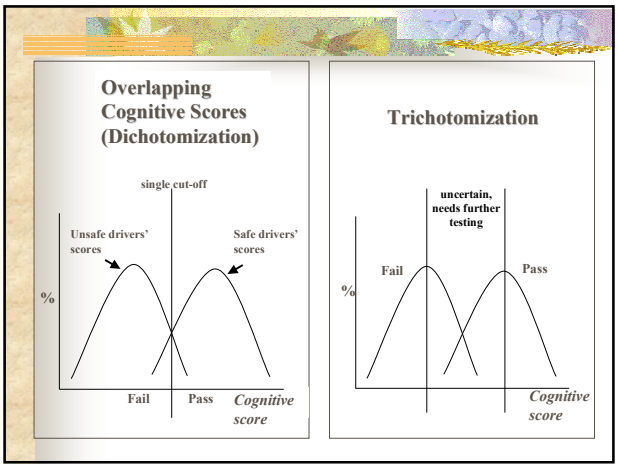
1. Generally, functional losses stratify severity better than MMSE
   - mild: generally involves only mild losses, e.g., loss of one or two (not more) instrumental activities of daily living (IADLs) (i.e., SHAFT) or MMSE ≥24 (education >grade eight)

S: Shopping
H: Housework
A: Accounting = finances
F: Food preparation
T: Transportation
(some patients with mild dementia may still be safe to drive)

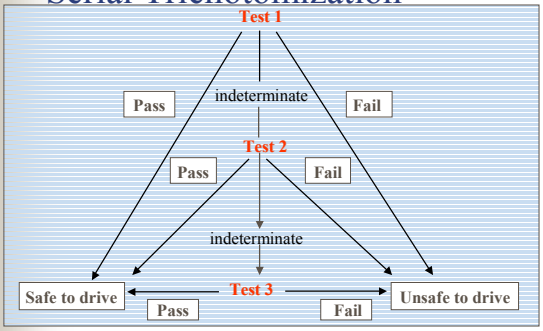
Also laundry, small machinery and use of telephone

CANADIAN CONSENSUS COMMITTEE GUIDELINES 2006:
Driving is contraindicated in persons who, for cognitive reasons, have an inability to independently perform multiple IADLs or any of the basic ADLs (e.g., toileting, dressing) (grade B/level III)

ADL = activity of daily living



Serial Trichotomization



Applying Trichotomization

- Given the assessment would you get in the car with the patient driving (or would you let a loved one drive with them)?
  - Yes
  - Uncertain
  - Absolutely not

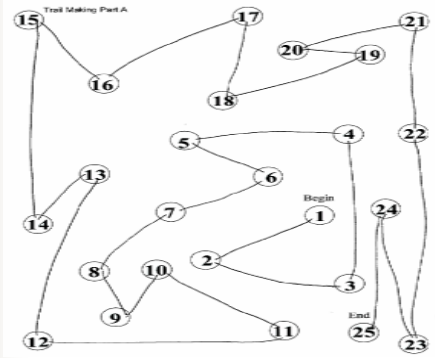
The MMSE

- There is questionable correlation between driving safety and the MMSE.
- The MMSE (when adjusted for age and education) can provide a rough framework for assessing driving safety. Patients scoring under 20 are likely unsafe to drive.
- Trichotomization (obviously unsafe, uncertain safety, obviously safe) approach may be helpful

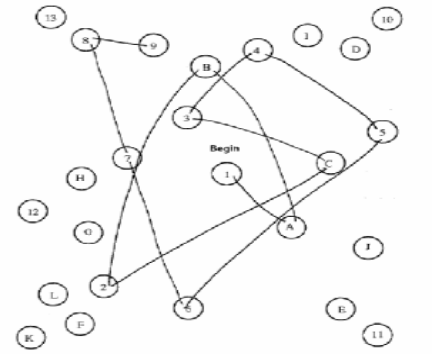
Clock Drawing Test

- A test of Executive Function and Visuospatial function
- Once again Trichotomization (obviously unsafe, uncertain safety, obviously safe) approach may be helpful

Trails A



Trails B



Trails A + B

Trails A and B are tests of memory, visuospatial, attention and executive function. Any errors or scoring below the 10th percentile in the time taken raises concerns about driving safety.

Norms for Trails A and B by age (in seconds) and education

Age	Percentiles: 90th/50th/10th			
	90/50/10	Trails A*	Trails B ≤Grade 12	Trails B >Grade 12*
65-69	90 50 10	25 37 53	60 86 137	52 68 77
70-74	90 50 10	26 38 61	70 101 172	59 84 112
75-79	90 50 10	27 46 70	78 120 189	57 81 178
80-84	90 50 10	31 52 93	72 140 158	89 128 223
85+	90 50 10	36 54 120	79 143 319	70 121 240

***Trails A: performance decreases with age but is NOT affected by education**

***Trails B: performance decreases with age AND with education**

A+B does not necessarily mean that the patient is safe to drive

TN Tombaugh *Arch clin neuropsychol* 2004;19,pg 203-14

(Failure = error(s) or time <10th percentile)

RED FLAGS

- Delusions
- Disinhibition
- Hallucinations
- Impulsiveness
- Agitation
- Anxiety
- Apathy
- Depression

RED FLAGS

Type of dementia:

- frontotemporal dementia (FTD), Parkinson's dementia or Lewy body dementia (LBD) may be **unsafe** at early stages

Significant visuospatial problems:

- poorly done intersecting pentagon/number placement on clock drawing, etc.

Organizing the clinical findings

3 Approaches

15-Minute Driving Safety Evaluation

1. Type of dementia: AD, VAD, Mixed AD/VAD, LBD, FTD, Other _____

2. Severity of dementia: Very mild, Mild, Moderate MMSE_____

3.

Potential Problem Areas	OK	A Concern:
a. vision		
b. Hearing		
c. Questions for the person		
d. Questions for the family		
e. Insight		
f. Judgement		
g. Visuospatial / Executive function		
h. Trails A/B		
i. Reaction time		
j. Personal ADL, Instrumental ADL		
k. Neurological deficits		
l. Musculoskeletal deficits		

4. Other medical issues/medications _____

SAFE ☐ - Reassess in 6 to 9 months

UNSAFE ☐ - Ministry of Transportation notification, letter to patient

UNCERTAIN ☐ - Specialized assessment (geriatric/OT/neuropsychology) or specialized on road testing

Driving Safety: Dementia Quick Checklist

1. **Dementia type**: AD, VaD, FTD, LBD, mixed AD/VaD, other: _____		MMSE _____ MoCA _____
2. **Severity** Very mild ☐ Mild ☐ Moderate ☐ Severe ☐		
3. **Family concerns**	OK ☐	A problem: ☐ _____
4. **Visuospatial ability**	☐	☐ Pentagon ☐ Clock ☐ Other _____
5. **Trails A/B**	☐	☐ Trails A _____ ☐ Trails B _____
6. **Judgment/insight**	☐	☐ _____
7. **Reaction time**	☐	☐ _____ ☐
Other medical/physical	☐	_____

Nasreddine ZS et al. *J Am Geriatr Soc*, 2005.

VaD = vascular dementia
MoCa = Montreal Cognitive Assessment

Driving Safety: Quick Seven-Item Checklist

2. Family concerns: e.g., what if grandchild is alone with driver?
3. Type of dementia: frontotemporal dementia (FTD) or Lewy body dementia (LBD) are **unsafe** regardless of other factors
4. Significant visuospatial problems: poorly done intersecting pentagon/number placement on clock drawing, etc.
5. Poor judgment/insight: *e.g., what should you do if…: fire in neighbour's kitchen, approaching yellow light, understanding driving with dementia is a risk*
6. Other medical/physical/medication issues: including reaction time (dropping a 12" ruler between thumb and index finger – usually caught by maximum of 9" or so)
7. Trails A and B: tests of visuospatial, executive function, attention and speed of processing (generally failed by failing to understand concept of test or by making errors, not by exceeding time limit)

After the Assessment

- Outcomes of Assessment
- Reporting duties
- Further testing
- Disclosure Techniques: telling the patient

Physician assessment of person with dementia

Patient not safe

Provincial Ministry of Transport notification

Patient notification (letter), copy for chart

Uncertain safety

Discuss with patient and family

Patient wishes to continue driving → referral to specialist or specialized on-road driving evaluation + report to Ministry of Transportation

or

Patient decides to stop driving – report to Ministry of Transport notification

Patient safe

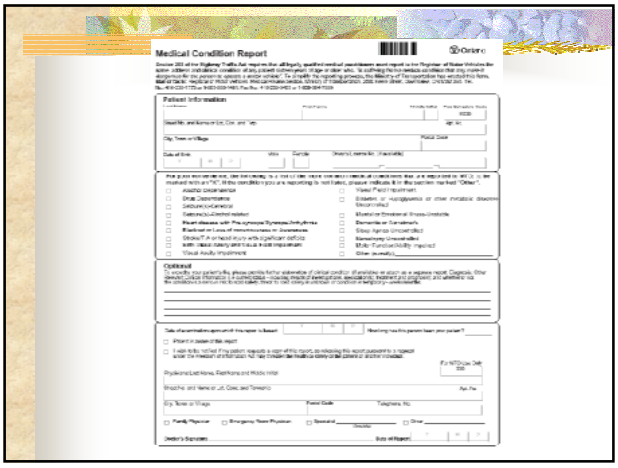
Discuss with patient and family

*At some time driving cessation will be necessary

*Suggest driving training and self-limitation

Book six- to nine-month follow-up to reassess driving safety + report to Ministry of Transportation

Province	Obligation to Report	Protection
British Columbia	Mandatory	Yes – report is privileged. No right of action against physician for reporting
Alberta	**Discretion**	Yes – No liability for reporting.
Saskatchewan	Mandatory	Yes – Report is privileged. No right of action against physician for reporting.
Manitoba	Mandatory	Yes – Report is privileged. No right of action against physician for reporting.
Ontario	Mandatory	Yes – Report is privileged and not admissible. No action against physician for complying with reporting.
Quebec	**Discretion**	Yes – No action against physician for reporting.
New Brunswick	Mandatory	Yes - No action against physician for reporting.
Prince Edward Island	Mandatory	Yes - Report is privileged. No right of action against physician for reporting.
Nova Scotia	**Discretion**	Yes - No action against physician for reporting.
Newfoundland	Mandatory	Yes - Report is privileged and not admissible. No action against physician for complying with reporting.
Yukon Territory	Mandatory	Yes – No liability for reporting
North West Territory	Mandatory	Yes – There can be no action unless physician acted maliciously or without reasonable grounds. Report is privileged.


Medical Condition Report

Patient Information

How to Report

- Mild dementia (and no concerns re. driving)
  - "Patient has mild dementia with MMSE ___, Trails B ___. I have not noted any evidence to suggest they are not fit to drive but feel they should be re-evaluated every 6 months."
- Moderate to severe dementia (or mild if there are concerns regarding fitness-to-drive)
  - "Patient is not safe to drive due to the following findings: _____ _____"

Notification About Driving Safety

Name: _____
Date: _____
Address: _____

You have undergone assessment for memory/cognitive problems. It has been found by comprehensive assessment that you have _____ dementia. The severity is _____.

Even with **mild** dementia, compared to people your age, you have an 8 times risk of a car accident in the next year. Even with **mild** dementia, the risk of a serious car accident is 50% within 2 years of diagnosis.
Additional factors in your health assessment raising concerns about driving safety include:

_____
_____
_____
_____

As your doctor, I have a legal responsibility to report potentially unsafe drivers to the Ministry of Transport. Even with a previous safe driving record, your risk of a car accident is too great to continue driving. Your safety and the safety of others are too important.

_____ M.D. _____ Witness

Fitness to drive unclear
Further Assessment Required

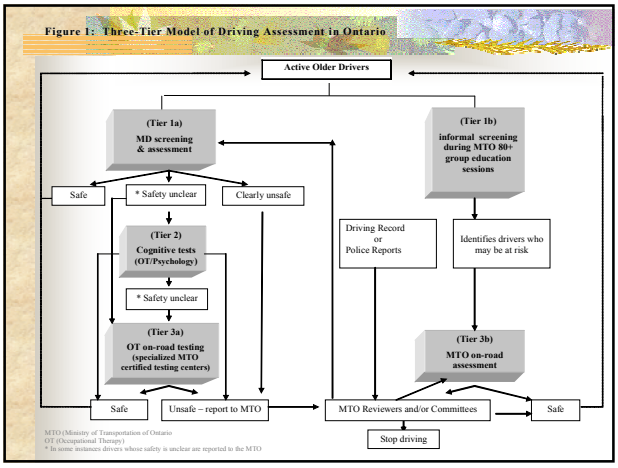
- Fitness to drive unclear
  or
  deficits may be temporary
- Notify jurisdictional authorities as per provincial reporting requirements

Specialized Driving Assessment

- Cognitive tests (Neuropsychologist, OT)
  - can rule out the more obviously impaired
- Driving Simulator Evaluation
  - not fully acceptable for ultimately determining fitness to drive
  - can give insight to the evaluator for the on-road assessment
- On-Road Assessment (OT / Driving Instructor)
  - Present Gold Standard

Outcomes of the Specialized Assessment

- Pass/ Fail
- Further Training Recommended
- Follow-up required for chronic degenerative conditions (6 – 9 months for dementia)
- Restricted License
  - available in some provinces



Key Learning Points

1. If dementia is diagnosed, driving must be asked about, formally assessed, and documented.
2. Physicians can perform a comprehensive driving safety clinical evaluation in approximately 15 to 20 minutes.
3. If you are unsure of safety, refer to specialized assessment or specialized on-road testing.
4. In dementia, driving safety must be reassessed every 6 to 9 months.

Resources

- Determining Medical Fitness to Drive: A Guide for Physicians. Canadian Medical Association Driver's Guide 7th edition.
  - www.cma.ca
- Driving and Dementia Tool Kit for Family Physicians (Dementia Network of Ottawa-Carleton)
  - www.rgpeo.com .
  - www.CanDRIVE.ca

The End

- Do you agree / disagree with the approaches?
- Can you recommend better approaches or refinements? (fmolnar@ottawahospital.on.ca)
- Are there any other scenarios that you would like to discuss?