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MEDICINE & DENTISTRY

Family Medicine Obstetrics
Grand Rounds – November 19, 2020

Presentation: Diet and supplements in pregnancy: Doc, can I please drink coffee and eat sushi?

Presenter: Dr. Andrew Hemphill

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Scientific Planning Committee Disclosure

- **Faculty: Dr. Laura Lyons**
  Dr. Andrew Hemphill
  Dr. Page Hacking
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- **Relationships with commercial interests:**
  No conflicts of interest.

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Disclosure of Commercial Support

- This program has received no in-kind support.
- This program has received no commercial financial support.

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Faculty/Presenter Disclosure

Presenter: Dr. Andrew Hemphill

Relationships with commercial interests:

No conflicts of interest.

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Mitigating Potential Bias

Presenter received a detailed letter from the Organizing Committee outlining the learning objectives and content expectations for each presentation.

Presentation have been reviewed by a member of the Scientific Planning Committee to ensure balance in content and the absence of bias.

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Learning objectives:

1. Understand the evidence for supplement recommendations including calcium, Vitamin D, and folic acid during pregnancy.
2. Understand what foods are unsafe in pregnancy, why they are unsafe and how much risk they pose.
3. Understand what can and can't be eaten in pregnancy and dispel commonly held myths.

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Supplements

- Folic Acid
- Vitamin D
- Calcium

Folic Acid

- Neural tube defects
- Preterm birth
- Infant asthma

Calcium + Vitamin D

Nutrition			
4	Calcium adequate	☐ Y	☐ N
5	Vitamin D adequate	☐ Y	☐ N

Calcium + Vitamin D

4. Calcium adequate	The adequacy of dairy products or other calcium sources in the normal diet. Eat Right Ontario [4] and Health Canada [5] recommend 1000 mg/day of calcium during pregnancy with a higher dose of 1300 mg/day of calcium for those under 19. The SOGC Guideline recommends calcium supplementation of at least 1 g/day, orally, for pregnant people with low dietary intake of calcium (< 600 mg/day) who are at high risk of preeclampsia [6].
5. Vitamin D adequate	Inform about of the importance of vitamin D stores while pregnant and breastfeeding. Patients/clients at risk for low vitamin D stores include those who: • Have darker skin tones • Live in northern latitudes, • Routinely cover their skin for cultural reasons • Have diets low in vitamin D. The recommended total daily intake from diet and supplementation is 15 mcg (600 IU) [5].

Cochrane review

- Calcium
  - ↓ Preeclampsia
  - ↓ High BP
  - ↓ Preterm birth
  - ↑ HELLP

Cochrane review

- Vit D
  - ↓ Preeclampsia
  - ↓ GDM
  - ↓ Low birthweight
  - ↓ Severe PPH

- Vit D + Calcium
  - ↓ Preeclampsia
  - ↑ Preterm birth

Prenatal vitamins

	PregVit	Materna	Kirkland
Dosing	2 different tabs daily	1 tab daily	1 tab daily
Iron (Fe Fumarate)	35 mg	24 mg	27 mg
Calcium	300 mg	250 mg	250 mg
Vitamin D	250 IU	600 IU	400 IU
Folate	1100 mcg	600 mcg	1000 mcg

Diet

- Raw Eggs
- Deli Meats
- Raw/undercooked meat

Raw/undercooked eggs

- Care reports are rare
- Coughlin et al., 2003 - S Virchow.
- Schloesser et al., 2004 – S Virchow.
- Scialli & Rarick, 1992 – S group C.
- Duguid & North, 1991 - In their defense

Eggs recommendations

- FDA
- Mount Sinai
- UK FSA
  “Pregnant women, infants, young children and elderly people can safely eat raw or lightly cooked eggs that are produced under the British Lion Code of Practice”

Raw/undercooked eggs

- Danger is due to Salmonella
- Causes nausea, vomiting, abdominal cramps, and diarrhea
- Can lead to sepsis, intrauterine infection

Salmonella

Outbreak	Vehicle	Initially reported ill	Initial human isolations	Ill identified	No. at risk	Attack rate (%)	Estimated ill
1	Turkey roll	30-44	10	44	1,400	18	250
2	Custard-filled doughnuts	5	5	100 +	UNK	UNK	100 +
3	Banana cream pie	88	12	135	700	43.7	306
4	Delicatessen foods	3	3	18	23	78	18
5	Turkey	10-61	29	65	1,000	85	850
6	Barbecued chicken	1	1	25	56	49	27
7	"	1	1	82	UNK	UNK	82 +
8	Meringue cream pies	27	27	244	3,000 - 6,000	50 ±	2,200 ±
9	Chocolate meringue pie	1	1	214	719	34.1	245
10	Banana meringue pie	2	2	30	180	46.2	83
11	Lemon meringue pie	64	12	129	719	47.4	341
12	Turkey	200	5	287	7,000	27.1	1,897
13	Delicatessen foods	198	63	240	4,000	45.9	1,836
14	Turkey salad	1	26	122	1,900	27.7	526
15	Kosher dessert with eggs	100-196	34	196	3,450 +	52	1,794
16	Water	197	110	1,035	133,219 +	11.8	16,000
17	Probably food	118	85	318	1,106	30.4	336
18	Probably food	1	1	16	500 ±	35.6	178
19	" "	1	1	302	3,884	7.8	302
20	Cold beef	8	47	376	1,000	60	600
21	Cheddar cheese	28	149	339	31,840	12.9	4,107
22	Roast beef	1	1	19	62	51.4	32
23	Cold ham and/or turkey	5	5	82	124	79	98
24	Turkey	5	5	65	111	67	74
25	Banquet dinner	4	2	89	290	35.4	103
26	Probably turkey	2	13	379	1,160	33.6	390

Deli Meats

- Listeria monocytogenes - Listeriosis
- Maple Leaf Foods 2008
- Pregnant women more susceptible
- High fatality rate
- Ghkjgh
- Cvhgkj
- hgcfkjf

Listeria

Selected Multistate Outbreaks

2020
- Deli Meats – Listeriosis
- Enoki Mushrooms – Listeriosis

2019
- Hard-boiled Eggs – Listeriosis
- *Listeria monocytogenes* Infections
- Deli-Sliced Meats and Cheeses – Listeriosis

2018
- Pork Products – Listeriosis
- Deli Ham – Listeriosis

2017
- Vulto Creamery Soft Raw Milk Cheese – Listeriosis

2016
- Frozen Vegetables – Listeriosis
- Raw Milk – Listeriosis
- Packaged Salads – Listeriosis

2015
- Soft Cheeses – Listeriosis
- Ice Cream – Listeriosis

2014
- Commercially Produced, Prepackaged Caramel Apples – Listeriosis
- Bean Sprouts – Listeriosis
- Cheese – Listeriosis
- Dairy Products – Listeriosis

2013
- Cheese – Listeriosis

2012
- Ricotta Salata Cheese – Listeriosis

2011
- Cantaloupes – Listeriosis

	Literature Review (n=180 episodes) No. (%)	Present Series (n=11 episodes) No. (%)	Total (n=191 episodes) No. (%)
Fever†	117 (65)	9 (82)	126 (65)
"Flu-like" syndrome	61 (34)	—	61 (32)
Abdominal or back pain	38 (21)	3 (27)	41 (21.5)
Vomiting/diarrhea	11 (6)	3 (27)	14 (7)
Headache	18 (10)	2 (18)	20 (10.5)
Myalgia	6 (4)	2 (18)	8 (4)
Sore throat	5 (3)	2 (18)	7 (4)
None	55 (31)	—	55 (29)

*Patients may have more than 1 symptom. Total may not equal 100% due to rounding.

†In the present case series and when data were available in the literature, fever was defined as temperature ≥38.2 °C.

Listeriosis During Pregnancy: A Case Series and Review of 222 Cases

MYLONAKIS, ELEFTHERIOS; PALIOU, MARIA; HOHMANN, ELIZABETH L.; CALDERWOOD, STEPHEN B; WING, EDWARD J.

Medicine81(4):260-269, July 2002.

	Literature Review (n=94 episodes) No. (%)	Present Series (n=6 episodes) No. (%)	Total (n=100 episodes) No. (%)
Respiratory distress	56 (60)	5 (84)	61 (61)
Fever†	45 (48)	3 (50)	48 (48)
Meningismus, lethargy, seizures, or other neurologic symptoms	23 (25)	1 (17)	24 (24)
Skin rash	17 (18)	3 (50)	20 (20)
Jaundice	5 (6)	—	5 (5)
Other/none	22 (24)	—	22 (22)

*Patients may have more than 1 symptom. Total may not equal 100% due to rounding.

†In the present case series and when data were available in the literature, fever was defined as temperature ≥38.2 °C.

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Listeria

- Case series in Auckland, New Zealand
  - Flu-like illness
  - Preterm labour
  - Chorioamnionitis
  - Fetal distress/meconium
  - Fetal death

Raw fish/shellfish

- Most illnesses are from raw shellfish, not fish used in sushi
- Not nearly as bad as chicken
- Due to a parasite in wild fish

Anasakis

- Parasitic helminth infection from aquatic environments only
- Humans are incidental hosts
- Severe abdo pain, nausea, vomiting, diarrhea
- Anaphylaxis
- Chronic infection and fetal effects
- Most cases in Japan
- Extremely rare in Canada

Public Health Ontario
PARTNERS FOR HEALTH

Santé publique Ontario
PARTENAIRES POUR LA SANTÉ

Evidence Brief: Control of parasites by freezing in fish for raw consumption

Key Messages

- Parasites are ubiquitous in aquatic and fresh water environments.
- Parasitic infection is a known risk from consuming raw or lightly cooked fish.
- Freezing provides an effective means of inactivating parasites in raw and undercooked fish.
- The effectiveness of killing parasites by freezing varies with the type of fish, type of parasite, temperature achieved, and length of time held at that temperature.

August 2017

Toxoplasmosis

Toxoplasmosis

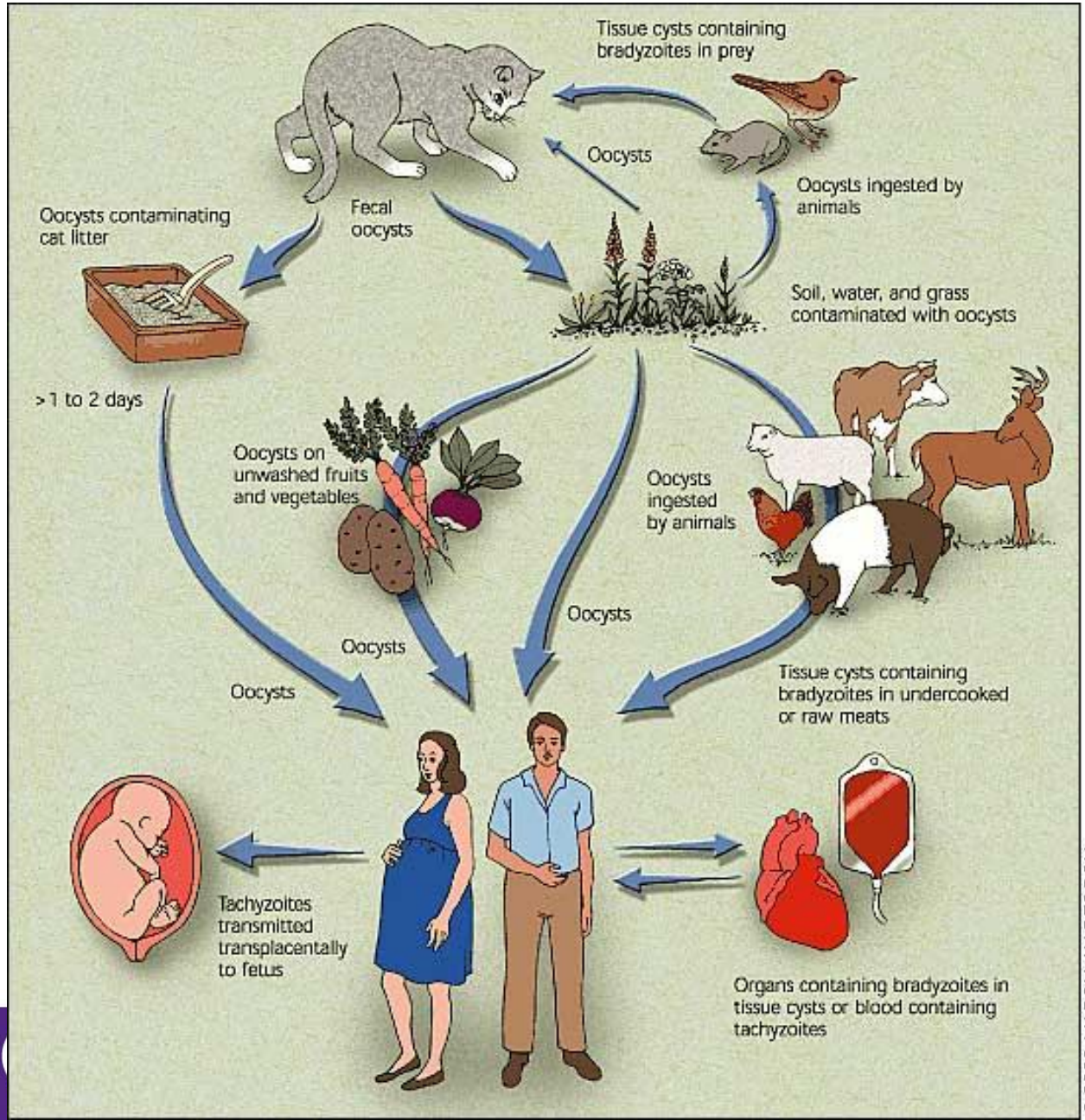

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Table 2

Multivariate analysis of risk factors for *Toxoplasma gondii* infection adjusted for age, location, period between diagnosis of infection and interview, and all other exposures shown

Exposure	Odds ratio (95% CI)	P value
Cat that hunts	1.26 (0.7 to 2.4)	0.47
Eat raw sausage	0.91 (0.5 to 1.6)	0.76
Eat dry to cured meat	0.82 (0.7 to 1.4)	0.99
Eat salami*	1.31 (0.9 to 2.0)	0.22
Eat frozen meat	0.77 (0.5 to 1.2)	0.29
Raw/undercooked beef*	1.73 (1.1 to 7.2)	0.01
Raw/undercooked lamb*	3.13 (1.4 to 7.2)	0.007
Raw/undercooked pork*	1.40 (0.7 to 2.8)	0.34
Other meat*†	4.12 (1.6 to 10.9)	0.004
Taste meat cooking*	1.52 (1.0 to 2.4)	0.07
Unpasteurised milk*	1.47 (0.9 to 2.5)	0.16
Untreated water	1.21 (0.7 to 2.0)	0.46
Use of microwave cooker	1.30 (0.8 to 2.3)	0.35
Contact with soil*	1.81 (1.2 to 2.7)	0.005
Working with animals*	1.50 (0.8 to 2.7)	0.19
Travel outside Europe/US or Canada*	2.33 (1.3 to 4.1)	0.003
Living on farm	1.15 (0.6 to 2.2)	0.66

*Included in additive relative risk model used to estimate population attributable fraction.
†Other meat includes venison, horse, rabbit, whale, and game birds.

Toxoplasmosis

Cook AJ, Gilbert RE, Buffolano W, et al. Sources of toxoplasma infection in pregnant women: European multicentre case-control study. European Research Network on Congenital Toxoplasmosis. *BMJ*. 2000;321(7254):142-147

Western

Toxoplasmosis

Work with meat, yes vs no	3.15 (1.09, 9.10)	5 (2, 7)
Have kittens		
≥3 vs 0	27.89 (5.72, 135.86)	10 (9, 13)
1–2 vs 0	0.64 (0.26, 1.56)	…
Eat locally produced cured, dried, or smoked meat, yes vs no	1.97 (1.18, 3.28)	22 (7, 32)
Eat rare lamb, yes vs no	8.39 (3.68, 19.16)	20 (17, 21)
Eat raw ground beef, yes vs no	6.67 (2.09, 21.24)	7 (5, 8)
Microwave meat, yes vs no	0.44 (0.24, 0.81)	22 (8, 46)[c]
Drink unpasteurized goat's milk, yes vs no	5.09 (1.45, 17.80)	4 (1, 5)

Jones, JL, et al. Risk Factors for *Toxoplasma gondii* Infection in the United States, *Clinical Infectious Diseases*, Volume 49, Issue 6, 15 September 2009, Pages 878–884

Mercury

Minimata and Iraq

- Observational studies of mercury poisoning
- Mental and motor delays
- Blood levels higher in babies than mothers

Mercury

Mercury

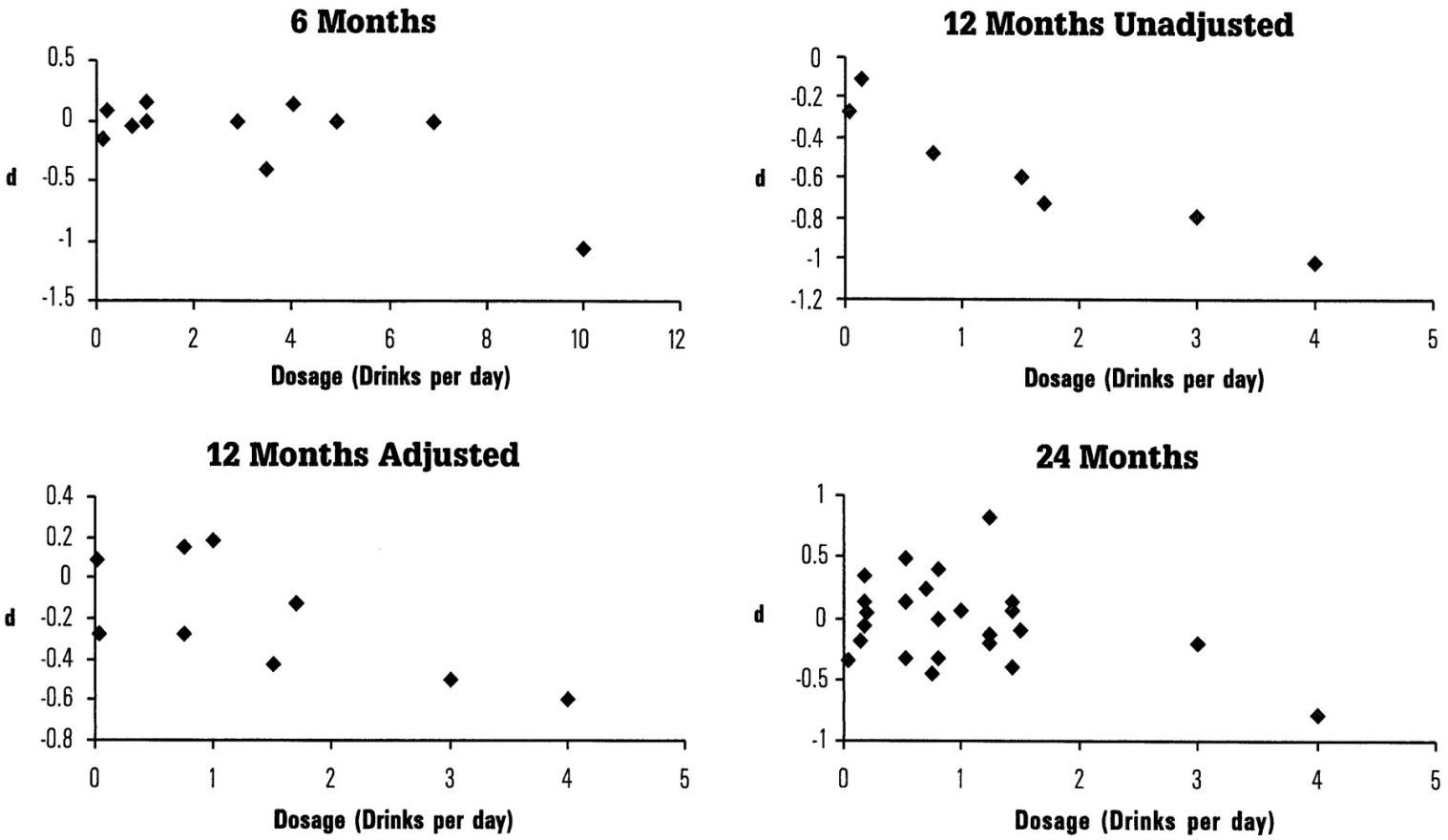

Best Choices
EAT 2 TO 3 SERVINGS A WEEK
Anchovy
Atlantic croaker
Atlantic mackerel
Black sea bass
Butterfish
Catfish
Clam
Cod
Crab
Crawfish
Flounder
Haddock
Hake
Herring
Lobster, American and spiny
Mullet
Oyster
Pacific chub mackerel
Perch, freshwater and ocean
Pickerel
Plaice
Pollock
Salmon
Sardine
Scallop
Shad
Shrimp
Skate
Smelt
Sole
Squid
Tilapia
Trout, freshwater
Tuna, canned light (includes skipjack)
Whitefish
Whiting
OR
Good Choices
EAT 1 SERVING A WEEK
Bluefish
Buffalofish
Carp
Chilean sea bass/ Patagonian toothfish
Grouper
Halibut
Mahi mahi/ dolphinfish
Monkfish
Rockfish
Sablefish
Sheepshead
Snapper
Spanish mackerel
Striped bass (ocean)
Tilefish (Atlantic Ocean)
Tuna, albacore/ white tuna, canned and fresh/frozen
Tuna, yellowfin
Weakfish/ seatrout
White croaker/ Pacific croaker
Choices to Avoid
HIGHEST MERCURY LEVELS
King mackerel
Marlin
Orange roughy
Shark
Swordfish
Tilefish (Gulf of Mexico)
Tuna, bigeye
* Some fish caught by family and friends, such as larger carp, catfish, trout and perch, are more likely to have fish advisories due to mercury or other contaminants. State advisories will tell you how often you can safely eat those fish.
www.FDA.gov/fishadvice
www.EPA.gov/fishadvice
EPA United States Environmental Protection Agency
FDA U.S. FOOD & DRUG ADMINISTRATION

Alcohol

- Worldwide use is 9.8% during pregnancy
- Effects on:
  - Mental development
  - Preterm birth
  - IUGR
  - ADHD
  - Fetal Alcohol Syndrome

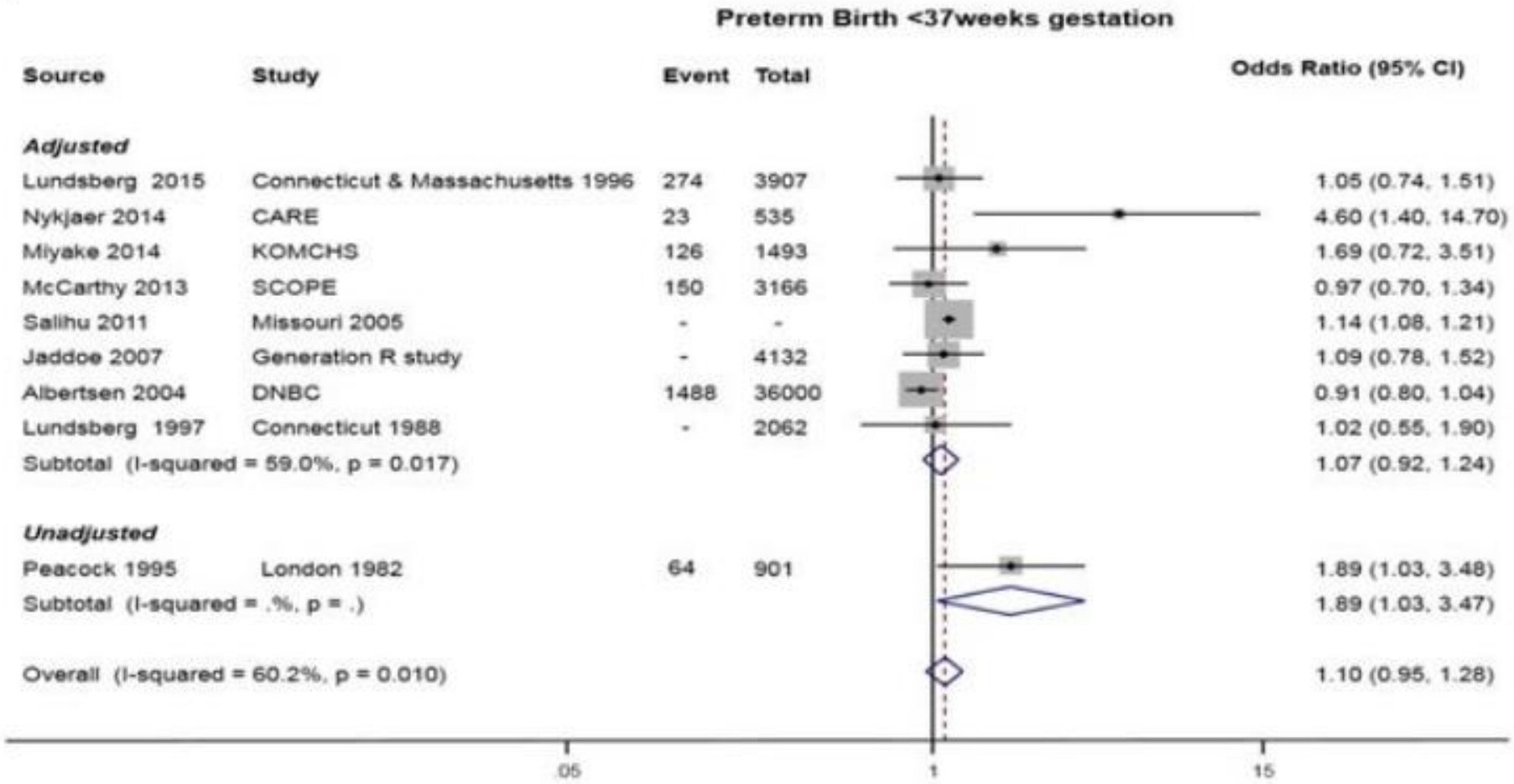
Mental development

Fig. 1. Dosage by effect size (d) scatterplots for 6-month-old, 12-month-old, and 24-month-old children.



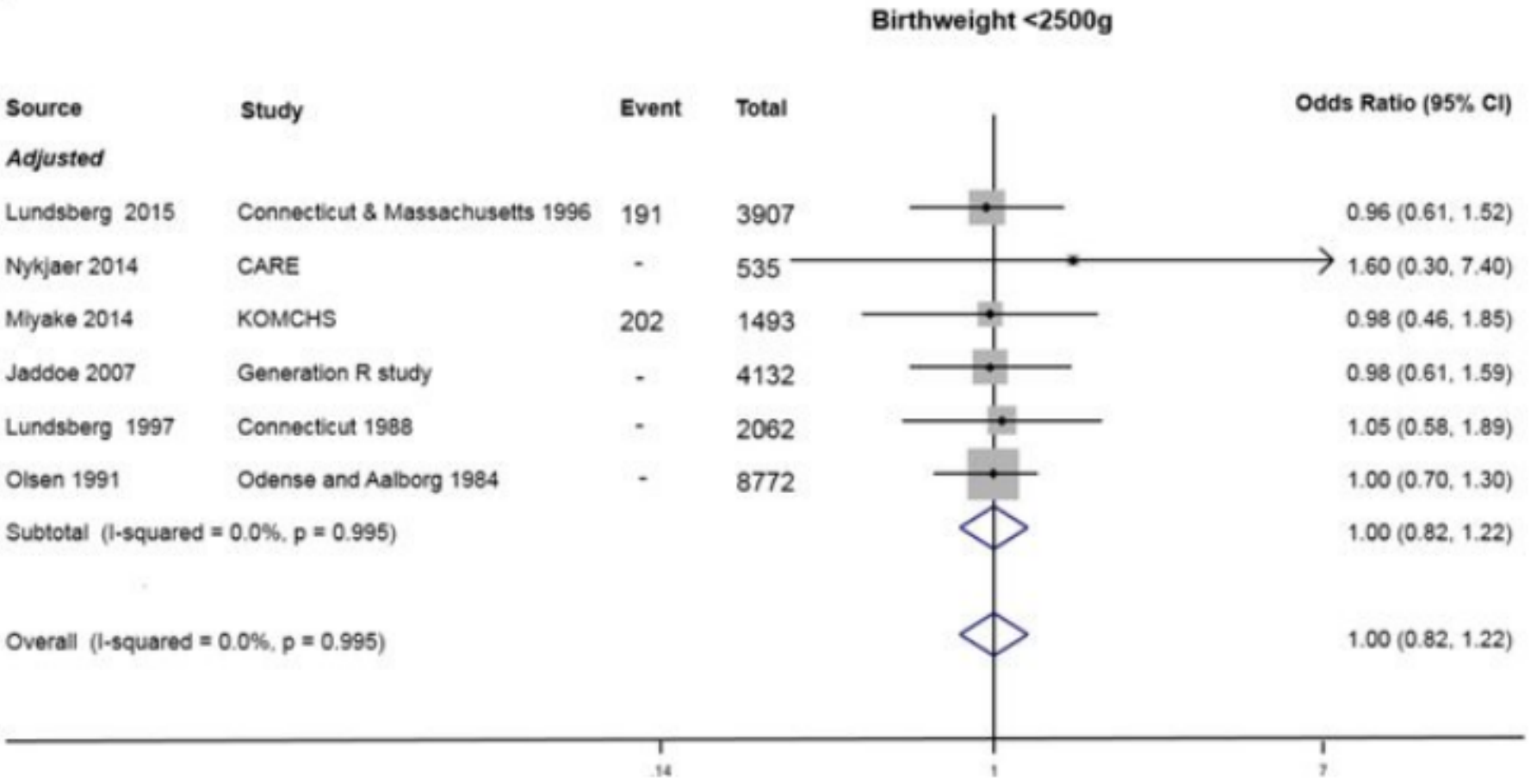
Alcohol Alcohol, Volume 38, Issue 4, July 2003, Pages 295–304, https://doi.org/10.1093/alcalc/agg087

a)



Mamluk L, Edwards HB, Savović J*, et al.* Low alcohol consumption and pregnancy and childhood outcomes: time to change guidelines indicating apparently 'safe' levels of alcohol during pregnancy? A systematic review and meta-analyses. *BMJ Open* 2017;**7:**e015410.

c)



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“Healthy drinker effect”

- Systematic review – Henderson et al. (2007)

ADHD

- Some studies convincing but other risk factors need to be adjusted for

Motherisk

Fetal Malformations

			Congential Defect				
Ref.	Type of Study	Exposure	Yes	No	Total	OR	95% CI
McDonald et al. (41)	Case-control	Yes	166	7191	7357	1.05	0.69–1.23
		No	1701	77279	78980		
		Total	1867	84470	86337		
Davis et al. (8)	Cohort	Yes	4	474	478	9.09	0.49–1.69
		No	0	479	479		
		Total	4	953	957		
Silva et al. (63)	Cohort	Yes	5	63	68	2.3	0.43–12.32
		No	2	58	60		
		Total	7	121	128		
Rossett et al. (56)	Cohort	Yes	4	158	162	0.37	0.12–1.11
		No	17	247	264		
		Total	21	405	426		
Ouellette et al. (48)	Cohort	Yes	18	110	128	1.59	0.76–3.34
		No	14	136	150		
		Total	32	246	278		
Mills et al. (43)	Cohort	Yes	1187	14108	15295	0.99	0.91–1.08
		No	1336	15778	17114		
		Total	2523	29886	32409		
Lumley et al. (39)	Cohort	Yes	14	505	519	1.13	0.66–1.96
		No	233	9523	9756		
		Total	247	10028	10275		

ACOG

Alcohol and Pregnancy

If you drink alcohol during pregnancy, your baby may be at risk of lifelong birth defects.

Moderate Drinking: What's the Risk?

There is no safe amount or type of alcohol use during pregnancy. Even moderate drinking (one drink a day) can cause lifelong problems for your baby. These problems may be less obvious than those caused by heavy drinking. They may include problems with

- coordination
- behavior
- attention
- learning
- understanding consequences

Heavy Drinking: What's the Risk?

Heavy drinking is having more than three drinks per occasion or more than seven drinks per week. The most severe result of heavy drinking during pregnancy is called fetal alcohol syndrome (FAS). FAS can cause serious birth defects for your baby, including

- problems with brain development
- lower-than-average height and weight
- smaller-than-normal head size
- abnormal facial features

DID YOU KNOW

- No drinks are safe. One beer, one shot of liquor, one mixed drink, and one glass of wine all contain about the same amount of alcohol.
- If you are trying to get pregnant, you should not drink alcohol.
- Didn't know you were pregnant? While no amount or type of alcohol is safe during pregnancy, serious harm is unlikely if you drank before you knew you were pregnant. The most important thing is to stop drinking alcohol when you find out you are pregnant.

Alcohol-related birth defects are completely preventable.

Do not drink alcohol during pregnancy.

If it is hard for you to stop drinking, talk with your obstetrician–gynecologist (ob-gyn) or other health care professional about getting help. You also can visit the Alcoholics Anonymous website at www.aa.org or call the Substance Abuse and Mental Health Services Administration's treatment referral line at 800-662-HELP (4357).

RCOG

The United Kingdom's Royal College of Obstetricians and Gynecologists advises that although an increasing body of evidence suggests harm to the fetus from alcohol consumption during pregnancy, there is no evidence of harm from low levels of alcohol consumption (defined as 1–2 units of alcohol once or twice a week).

SOGC

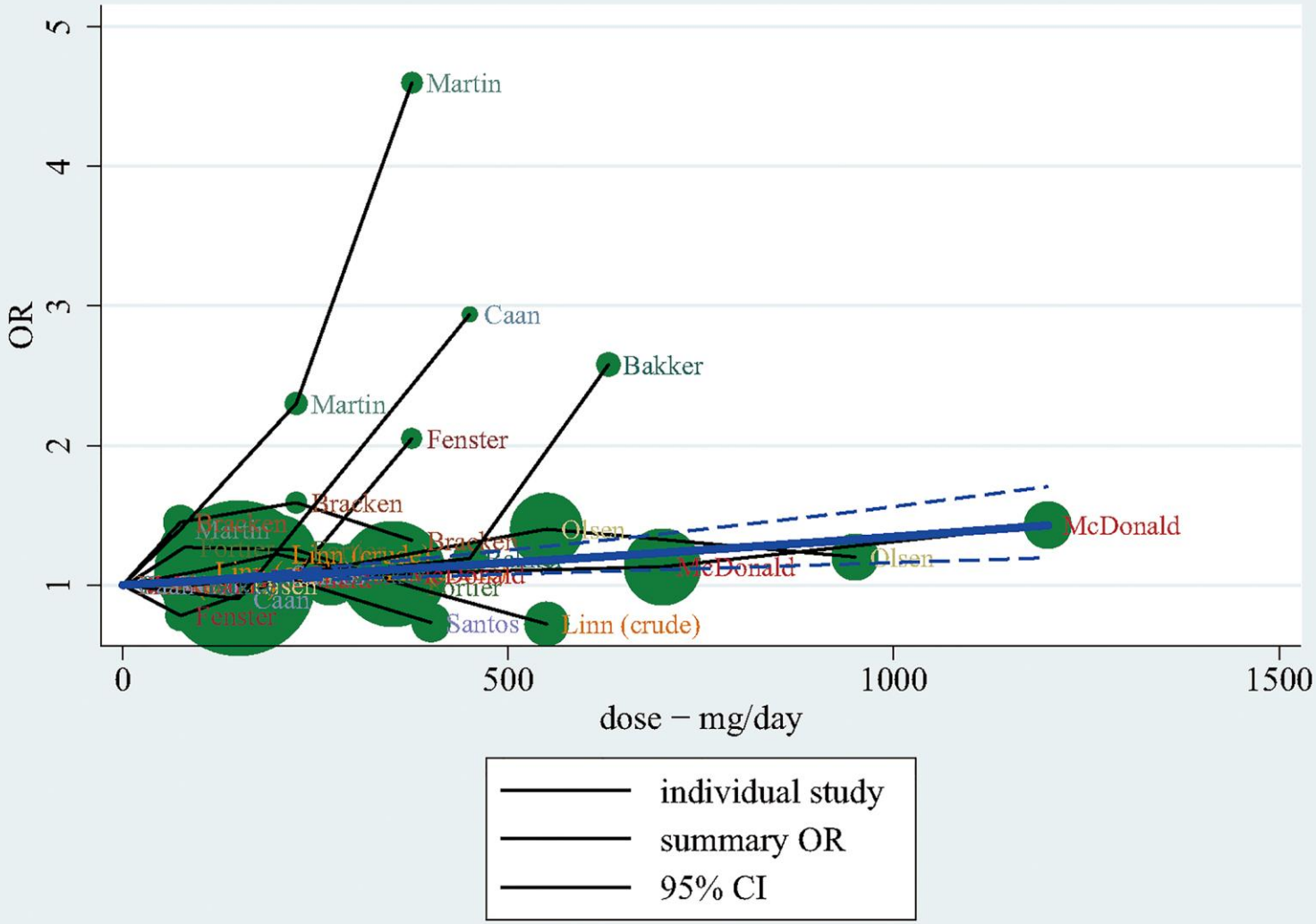
Summary Statements

1. There is evidence that alcohol consumption in pregnancy can cause fetal harm. (II-2) There is insufficient evidence regarding fetal safety or harm at low levels of alcohol consumption in pregnancy. (III)
2. There is insufficient evidence to define any threshold for low-level drinking in pregnancy. (III)
3. Abstinence is the prudent choice for a woman who is or might become pregnant. (III)
4. Intensive culture-, gender-, and family-appropriate interventions need to be available and accessible for women with problematic drinking and/or alcohol dependence. (II-2)

Coffee

- Miscarriage
- Low birthweight

Coffee



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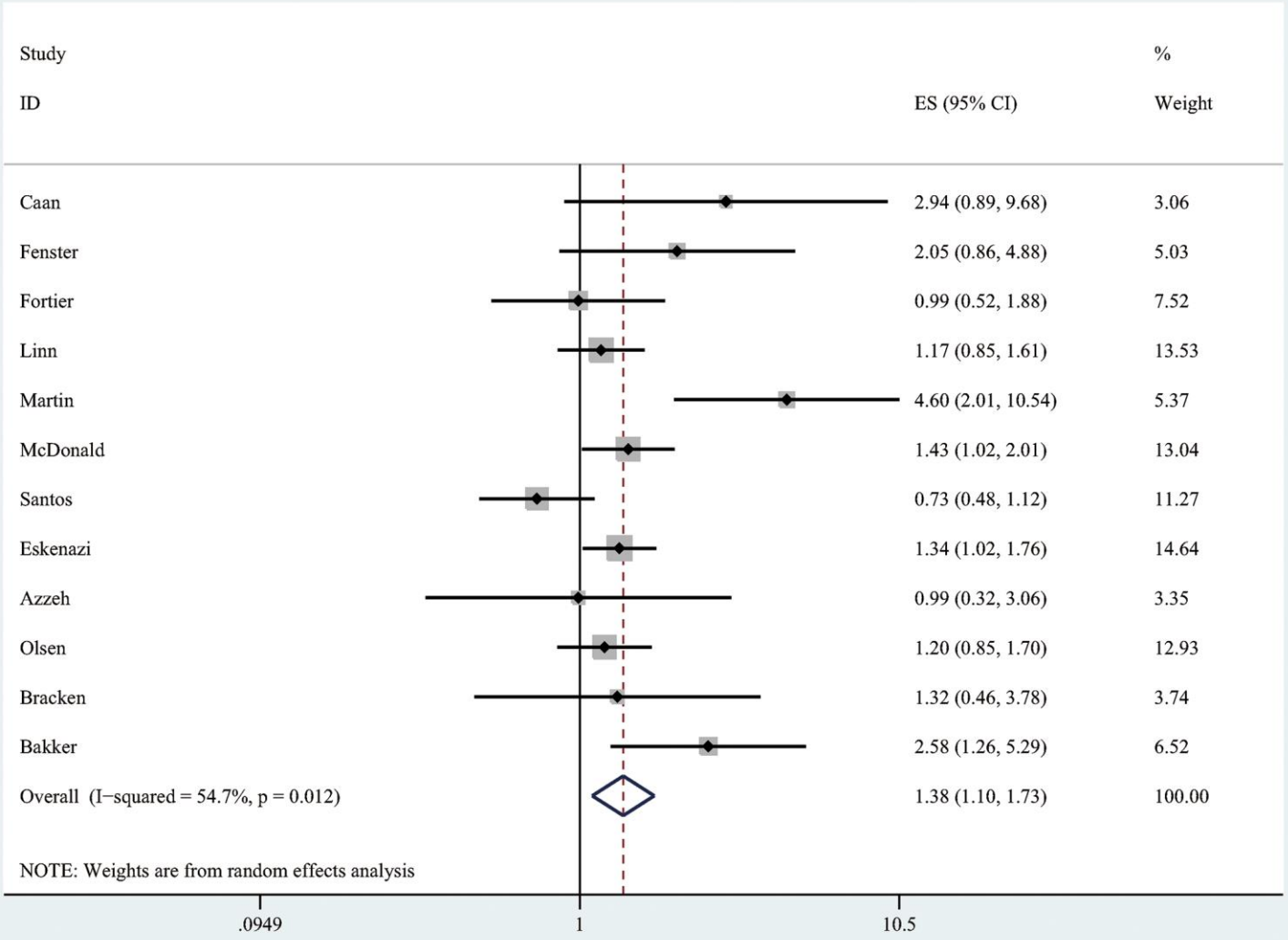
Coffee



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Thanks for waking up early with me!
Questions?

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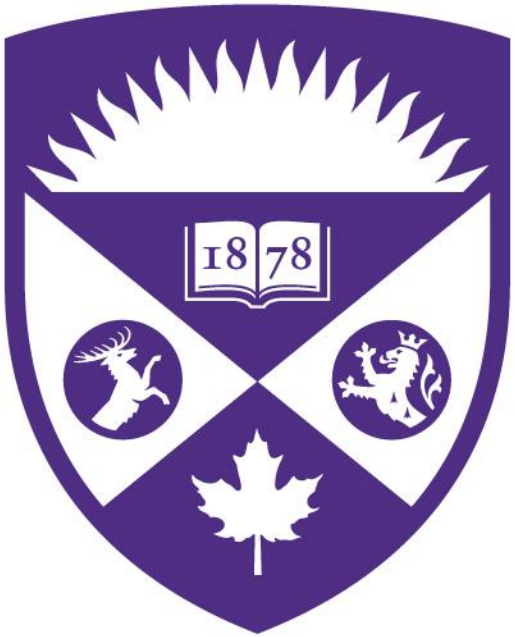

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