



AUTISM:
The Impact of Nutrition and PICA

Terry Broda, RN, BScN, NP-PHC, CDDN
Elizabeth Kacew, RN, MScN, NP-PHC

www.solution-s.ca

OBJECTIVES

- Nutrition
- Autism: DSM Criteria
- Autism & Nutrition - Physiology
- Myths vs. Facts
- Pica
- Health Promotion – Primary Prevention
- Documentation

www.solution-s.ca

BACKGROUND

- Cardiovascular disease (CVD) is one of the most common causes of death in adults with I/DD
- CVD is strongly associated with health behaviors specifically:
 - POOR NUTRITION and
 - LACK OF PHYSICAL ACTIVITY

www.solution-s.ca

BACKGROUND

- 93% of adults with I/DD in community have high fat diets
- Approx 69% do not consume enough fruits and vegetables
- Only 10% of adults with I/DD engage in physical activity, a min of 3 days/wk

www.solution-s.ca

BACKGROUND

- Common causes of obesity include:
 - **MEDICATIONS**
 - Sedentary lifestyle
 - Genetics
 - Environments
 - Lack of opportunity to control food choices
 - Lack of opportunity for choosing activities and exercise

www.solution-s.ca

BACKGROUND

MEDICATIONS:
Impact on nutritional status

1. Decrease/increase appetite
2. Nausea & vomiting
3. Altered taste or smell
4. Altered absorption

www.solution-s.ca

AUTISM: DIAGNOSTIC CRITERIA

Diagnostic Criteria for 299.00 Autistic Disorder
Six or more items from (1), (2), and (3), with at least two from (1), and one each from (2) and (3):

1. qualitative impairment in social interaction, as manifested by at least two of the following:

- marked impairment in the use of multiple nonverbal behaviors such as eye-to-eye gaze, facial expression, body postures, and gestures to regulate social interaction
- failure to develop peer relationships appropriate to developmental level
- a lack of spontaneous seeking to share enjoyment, interests, or achievements with other people (e.g., by a lack of showing, bringing, or pointing out objects of interest)
- lack of social or emotional reciprocity

www.solution-s.ca The American Psychiatric Association's Diagnostic and Statistical Manual-IV, Text

AUTISM: DIAGNOSTIC CRITERIA

2. qualitative impairments in communication as manifested by at least one of the following:

- delay in, or total lack of, the development of spoken language (not accompanied by an attempt to compensate through alternative modes of communication such as gesture or mime)
- in individuals with adequate speech, marked impairment in the ability to initiate or sustain a conversation with others
- stereotyped and repetitive use of language or idiosyncratic language
- lack of varied, spontaneous make-believe play or social imitative play appropriate to developmental level

www.solution-s.ca The American Psychiatric Association's Diagnostic and Statistical Manual-IV, Text

AUTISM: DIAGNOSTIC CRITERIA

3. restricted repetitive and stereotyped patterns of behavior, interests, and activities, as manifested by at least one of the following:

- encompassing preoccupation with one or more stereotyped and restricted patterns of interest that is abnormal either in intensity or focus
- apparently inflexible adherence to specific, nonfunctional routines or rituals
- stereotyped and repetitive motor manners (e.g., hand or finger flapping or twisting, or complex whole-body movements)
- persistent preoccupation with parts of objects
- Delays or abnormal functioning in at least one of the following areas, with onset prior to age 3 years: (1) social interaction, (2) language as used in social communication, or (3) symbolic or imaginative play.

www.solution-s.ca The American Psychiatric Association's Diagnostic and Statistical Manual-IV, Text

AUTISM-IMPACT ON NUTRTION

``Recent clinical studies have revealed a high prevalence of gastrointestinal symptoms, inflammation, and dysfunction in children with autism.`` (Horvath and Perkman, 2002)

www.solution-s.ca

COMMON GI SYMPTOMS IN AUTISM

- History of antifungal use in childhood
- Dairy intolerance
- Poorly formed stools
- Chronic constipation
- Poor sleeping habits
- Aggression SIB
- Colic or reflux
- Thrush/hx of diaper rash
- Abdominal distension
- Bloating
- Relapse after response to antifungal

www.solution-s.ca

Other GI issues in ASD



- Picky eaters' risks: FTT, IDA & other deficiencies (Zn, B12, Ca, protein)
- Sensory issues (assessment using a food diary: spicy, crunchy, sweet, salty)
- Diarrhea: r/o constipation & food diary needed (juice ++?)
- GERD: behavioral s/s (CdLS study: bite fist, pinch chin/neck, punch chest)
- Casein intolerance
(would need Mg & Vit D supplements for casein-free diets)

www.solution-s.ca

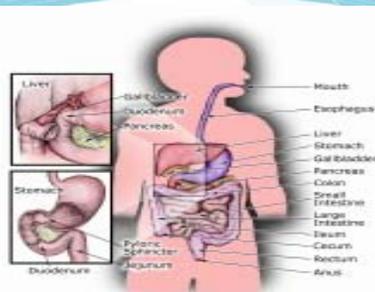
GI DYSFUNCTION AUTISM



- Malabsorption
 - Vitamin deficiency, fatty acid deficiency, dry skin, irregular stool
- Immune dysregulation/inflammation:
 - Sleep disorders, aggression, SIB
- Maldigestion
 - Food sensitivity, poor weight gain, low stomach acid

www.solution-s.ca

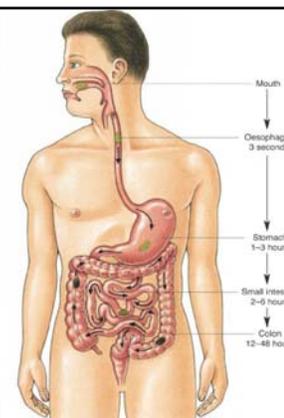
PHYSIOLOGY OF THE GUT



www.solution-s.ca

Transit times

- Mouth: 1 min
- Esophagus: 4-8 secs
- Stomach: 2-4 hrs
- Small intestine: 3 to 5hrs
- Colon: 10 hrs to several days



www.solution-s.ca

PHYSIOLOGY OF THE GUT



- The gastrointestinal (GI) system is specialized to process ingested particulate or liquid nutrients by reducing them to an "absorbable" size (digestion).
- Large, polymeric macromolecules (starches, lipids, proteins, and nucleic acids) must be
- reduced to their monomeric molecular subunits (e.g. – proteins to amino acids) for ease of transport across cell membranes of the GI mucosal lining.

www.solution-s.ca

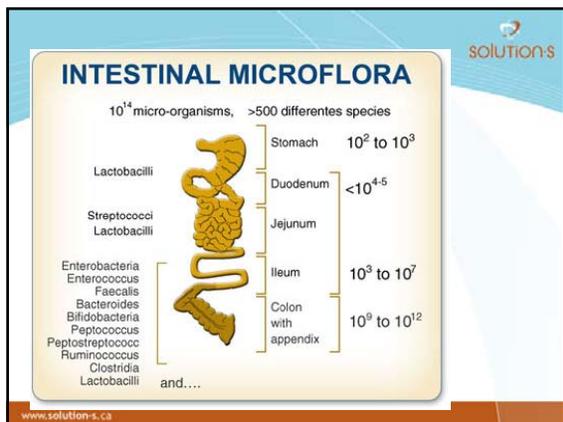
PHYSIOLOGY OF THE GUT



4 basic processes to complete nutrient degradation:

- (1) **mechanical degradation** (i.e.-chewing and churning);
- (2) **liquefaction** via secretion of GI accessory glands (i.e.- salivary, hepatic, pancreatic secretions, etc.)
- (3) **enzymatic hydrolysis** (i.e.- amylases break starch molecules into monosaccharide sugar subunits)
- 4) **absorption** via extensive mucosal membrane surface of lower GI tract.

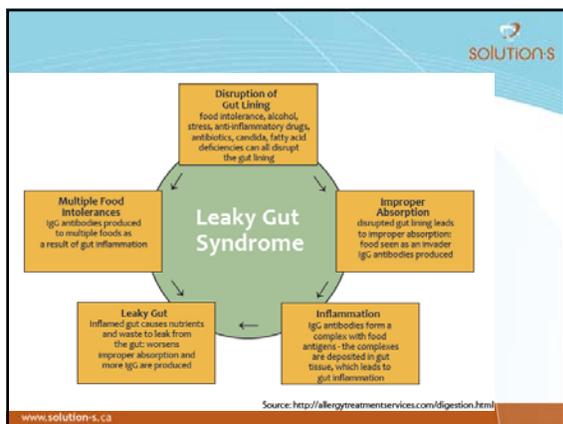
www.solution-s.ca



PATHOPHYSIOLOGY OF GUT AND AUTISM

- Studies indicate that individuals with ASD suffer from increased rates of GI symptoms including:
 - Diarrhea
 - Constipation
 - Unformed stools
 - GERD

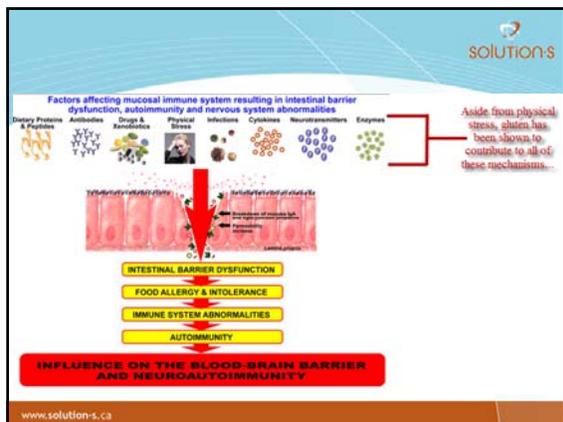
www.solution-s.ca



PATHOPHYSIOLOGY OF GUT AND AUTISM

- Cause is 'unclear'.....some research suggests:
 - Increased antibiotic used CAUSING decreased normal gut microbia
 - Abundance of Clostridium in children with ASD
 - Decreased digestive enzymes in individuals with ASD
 - Increased intestinal permeability in individuals with ASD

www.solution-s.ca



AUTISM AND NUTRITION MYTH VS FACT

www.solution-s.ca

MYTHS VS FACTS- AUTISM AND DIET

“A systematic review of the evidence regarding gastrointestinal (GI) problems in children with ASD found a lack of high-quality data . The authors concluded that the frequency and types of GI disorders observed in children with ASD are similar to those in children without ASD.”

www.solution-s.ca

www.solution-s.ca

CHELATION THERAPY

- Low levels of Glutathione
 - Glutathione responsible for primary defence against mercury, toxic chemicals, and toxic metals
 - Resulting in a higher level of burden r/t toxins in body
 - CHELATION THERAPY

FACT

- Limited supportive EVIDENCE-BASED research to effectively recommend this tx.....

www.solution-s.ca

Modality	Efficient Absorption	Highly Effective	For Chronic & Acute	Affordable & Convenient
IV EDTA Chelation	Yes	Yes	Yes	No
Oral- EDTA Chelation	No	No	No	Yes
EDTA Chelation Suppositories	Yes	Yes	Yes	Yes

www.solution-s.ca

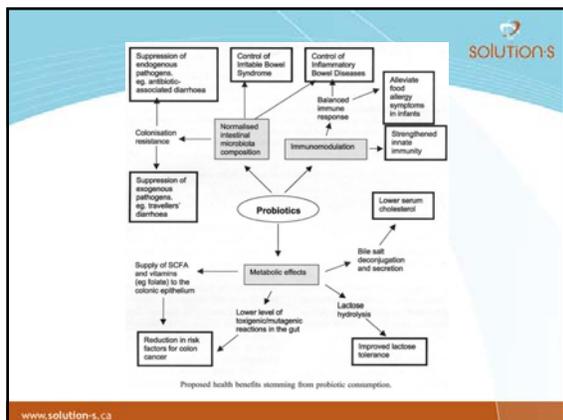
ANTIFUNGAL TX

- treatment for autism is based upon the hypothesis that there is yeast overgrowth secondary to an imbalance in microbes in individuals with ASD.
- This hypothesis became more popular after a report of two boys with autistic behaviors who had what was interpreted as yeast metabolites in their urine, suggesting candidal overgrowth

- There is **insufficient** information about the efficacy and safety of the antifungal agents to make recommendations

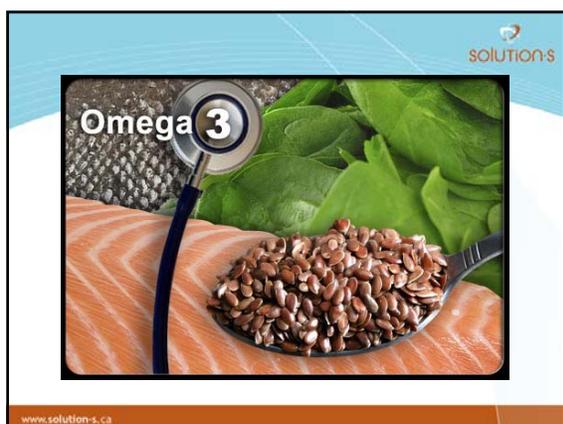
www.solution-s.ca

www.solution-s.ca



PROBIOTICS

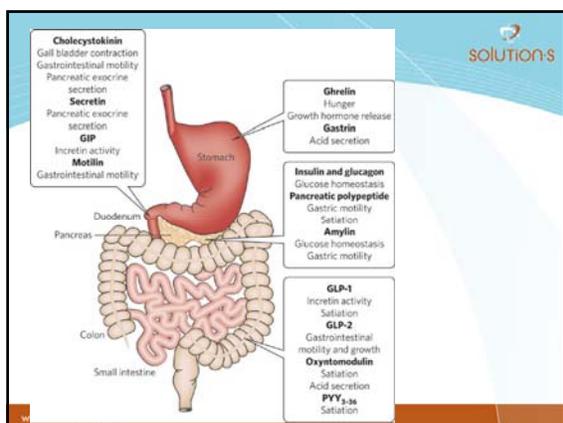
- probiotics as a treatment for autism is based upon the hypothesis that there is an imbalance in intestinal microbes in individuals
- There is insufficient information about the efficacy of probiotics to make recommendations about their use in children with ASD
- There are no current studies demonstrating harm



OMEGA 3 FATTY ACID

- Some studies suggest that plasma omega-3 concentrations in children with ASD are decreased,
- Use supplement for cardiovascular benefit

No clinical correlation has been established



SECRETIN

SECRETIN- GI hormone

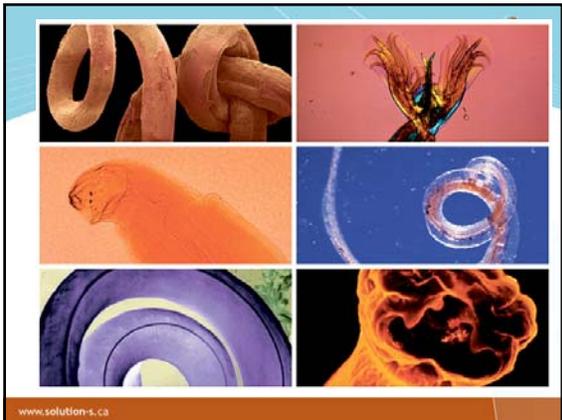
Inhibits: motility, release of gastric acid

Stimulates: secretion of pancreatic fluid and bicarbonate

Secretin as therapy based on hypothesis that ASD have lower levels of secretin

Limited evidence to support this hypothesis.

(Williams, Wray and Wheeler, 2009)



SOLUTIONS

HELMINTHIC THERAPY

Helminthic Therapy

- Early scientific stages
- Clinical trials underway
- Uses parasites

FACT

- Takes apx 12 wks to observe + change
- Taken orally ever 2-3wks
- Expensive
- NO supportive evidence-based research

www.solution-s.ca

SOLUTIONS

GF-CF
GLUTEN FREE / CASEIN FREE LIVING

www.solution-s.ca

SOLUTIONS

A gluten-free casein-free diet is recommended by the Autism Research Institute and other advocacy groups as a treatment for autism and related disorders.

Learn more here.

www.solution-s.ca

SOLUTIONS

GLUTEN FREE-CASIEIN FREE DIET (GF-CF)

GF-CF: Increased permeability allows gluten and casein peptides to leak from the gut

- ASD not found to have increased rates of celiac disease or
- Very difficult to sustain
- Has worked at the individual level but not a recommendation for Autism in general

www.solution-s.ca

SOLUTIONS

PICA

www.solution-s.ca

PICA

SOLUTIONS

Possible causes:

- OCD - obsessive compulsive dx?
- Problems of the hypothalamus?
- Lack of stimulation in environment?
- Gastric reflux?
- Deficiency of iron, zinc, calcium?

www.solution-s.ca

PICA

SOLUTIONS

Other considerations:

- Cigarettes : nicotine dependence , anxiety
- Broken glass : suicide, psychiatric illness
- BMs : PTSD, psychosis
- Rocks, sticks or pieces of metal : endogenous opiate addiction?

www.solution-s.ca

Pica: risks & complications

SOLUTIONS

- Infection: parasites
- Lead toxicity
- Bezoars: collections of indigestible matter that accumulate and coalesce in the GI tract (usually in the stomach, but may extend to jejunum)
 - Trichobezoar: composed of hair, carpet, string, clothing
 - Phytobezoars: plant materials with high cellulose & tannins such as celery, leeks, grape skins, persimmons, etc.)
- Obstruction/Perforation of GI tract
- Death!

www.solution-s.ca

HEALTH PROMOTION- PRIMARY PREVENTION

SOLUTIONS

Barriers:

- Lack of buy-in & engagement: programming, attitudes, accommodations
- Lack of opportunities
- Poor diets: too many calories!
- Sedentary lifestyles: 10% - 3X per week, 50% none: double the general population!
- Side effects of Rx
- Lack of staffing
- Lack of funding (for food & equipment)

www.solution-s.ca

SOLUTIONS

www.solution-s.ca

HEALTH PROMOTION- PRIMARY PREVENTION

SOLUTIONS

Components of good health promotion/primary prevention include:

1. Exercise
2. Nutrition
3. Health education
4. Caregiver support

www.solution-s.ca

HEALTH PROMOTION-PRIMARY PREVENTION- DIETARY GUIDELINES



- Focus on fruits and vegetables
- Ensure calcium rich products
- Choose health whole grain products
- Choose lean proteins
- Limit fat intake
- **PORTION CONTROL IS KEY!**

www.solutions-s.ca

Documentation

- Weight charts
- Food diary
- Bristol stool form
- Pain checklist
- Scatterplot
- A-B-C sheets
- Waist circumference measure
- Rashes/ scratching?

www.solutions-s.ca

Graph

Jack Brown 2011	Aug	Sept	Oct	Nov	Dec
Weight					
BP					
Pulse					
Waist Circumference					

FOOD DIARY

Name : SAMPLE Date : 22 Oct. 2006

TIME	AMOUNT	FOOD	SYMPTOMS/REACTIONS (if any)
09:30	1/2 cup	Kellogs Corn Flakes	
	1/2 cup	2% milk	
	125ml	Juice/orange	
	2 slices	Toast (W/W)	
	1	Egg	
10:45	1tp	marmalade	
	3 slices	watermelon	
	4 slices	Green apple	
	6	Raisins	
	500ml	water	11:30 irritable, yelling X 2
12:15	2	Egg sandwich (eggs & mayo, Celery & onion)	
	1	water	
	600ml	2% milk	
	1	Banana muffin	
15:30	2 glasses	water	
	6	Ritz crackers	
	3 slices	Kraft cheese	
18:30	2 bowls	Spaghetti with meat sauce	
	2 slices	Garlic bread	
	500ml	Coffee with 2% milk	
	1piece	Chocolate cake	
20:30	1piece	Chocolate cake	
	250ml	2% milk	21:30 yelling, crying, refuses to go to sleep, hitting her abdomen & in fetal position (bent over)

www.solutions-s.ca

THE BRISTOL STOOL FORM SCALE



Source: Heaton, B., 2001

The Non-Communicating Adult Pain Checklist—NCAPC

Name of individual: _____ Observer: _____
 Date: _____ Sum score when individual is not in pain: _____
 The individual's behavior is being evaluated due to: _____

How often has the client been showing the down listed behaviors within a 10 minutes period?

Item #	Sub-category	Item description	Not at all	Just a little	Fairly often	Very often
1		Moaning, whimpering, whimpering (fairly soft)	0	1	2	3
2		Crying (intermittent, loud)	0	1	2	3
3	Verbal reaction	Screaming/yelling (very loud)	0	1	2	3
4		A specific sound or word for pain (e.g. a word, a cry, a type of laugh)	0	1	2	3
5	Emotional reaction	Not cooperating, cranky, irritable, unhappy	0	1	2	3
6		Being difficult to distract, not able to satisfy or pacify	0	1	2	3
7		Facial grimaces, frowning, scowling	0	1	2	3
8	Facial expression	A change in eyes including squinting of eyes, eyes squinted wide, eye (non-squint)	0	1	2	3
9		Turning down of mouth	0	1	2	3
10		Movements of the lips and tongue (lips puckering up, tight, pointing, or quivering, teeth grinding, tongue pushing)	0	1	2	3
11	Body	Moving more or less	0	1	2	3
12	language	Swift spasms, tensing, rigid	0	1	2	3
13		Clustering to or touching part of the body that hurts	0	1	2	3
14	Protective reaction	Protecting, favoring, or guarding part of the body that hurts	0	1	2	3
15		Flinching or moving the body part away, being sensitive to touch	0	1	2	3
16		Moving the body in a specific way to show pain (e.g. head back, arms down, curls up)	0	1	2	3
17	Physiological reaction	Change in facial color	0	1	2	3
18		Respiratory irregularities (breath holding or gasping)	0	1	2	3

Sum score _____

Breau, L. et al., 2009.
 Score of 8 or more indicates pain & the higher the score, the higher the amount of pain.)
Breau, L. et al. (2009)



Section III: Behavioural and Mental Health Tools

ABC (Antecedent-Behaviour-Consequence) Chart
To record baseline information for incongruent, challenging or problematic behaviours

Name: _____
DOB: _____

Occasion Date Time Observer	Pre-existing conditions Factors that increase vulnerability or sensitivity to triggers	Antecedent What happened just before the behaviour occurred and might have triggered it? Include SETTING & ACTIVITY	Behaviour Describe the behaviour as accurately and specifically as possible. Include frequency, duration, or intensity (e.g. 10, 15, 20, 30, most severe).	Consequence Things that happened immediately after the behaviour occurred and more or less likely to happen again
Example:				
Date Feb 6/10 Time 4:30-5:10 pm Observer Name - primary staff member	John's mother was in hospital with broken leg, and could not visit. John had a headache. John used primary staff member's car for walking.	John was eating supper in kitchen, when another staff member bumped John's arm when passing food.	John started to yell and threw his plate across the table. He got out of seat, screamed for 10 minutes, and threw food around living room. The intensity was 8/10.	Staff tried to direct John to his room for 10 minutes but for 5 minutes more yelled. They also tried to direct him with the camera but was unsuccessful. They checked other staff members to leave the room. John began to hit staff when they approached him. Staff observed him from a distance, gave him time and reduced stimuli, and he calmed down in about 30 min.
Date				
Time				
Observer				
Date				
Time				
Observer				
Date				
Time				

Individualized SOLUTIONS

SE/hr	D/E/N						
Blurry vision							
Congestion							
Dry mouth							
Abnormal Movements							
Rigidity							
Dizziness							
Falls							
Constipation							
Urinary retention							
Vomiting							

RESOURCES SOLUTIONS

Interactive Autism Network
<http://www.iancommunity.org/>
 Autism Speaks
<http://www.autismspeaks.org/>
 Autism Ontario
<http://www.autismontario.com/>
 Autism Canada Foundation
<http://www.autismcanada.org/>
 Global Autism Alliance
<http://www.globalautismalliance.com/>
 Canadian Autism Spectrum Alliance
<http://www.asdalliance.org>

www.solution-s.ca

Bookstores SOLUTIONS

Parentbooks: located in Toronto!

- <http://www.parentbooks.ca/>

Brookes Publishing

- <http://www.brookespublishing.com/>

Cherry Hill Books

- <http://www.cherryhillbooks.com/>

www.solution-s.ca

Organizations SOLUTIONS

DDNA

- www.ddna.org

AADMD

- www.aadmd.org/

NADD

- www.thenadd.org/

www.solution-s.ca

Resources:



- The Autism Treatment Network at Autism Speaks:
www.autismspeaks.org/science/programs/atn/index.php
- Autism Central:
www.autismcentral.ca/research/
- Autism Connects:
www.autismconnects.com
- Autism Society of Canada:
www.autismsocietycanada.ca/

www.solution-s.ca

Resources:



- Canadian Autism Intervention Network:
<http://www.cairn-site.com>
- Health Canada's Autism website:
www.hc-sc.gc.ca/dc-ma/autism/index_e.html
- Surrey Place
www.surreyplace.on.ca/
- CNSC
www.community-networks.ca/

www.solution-s.ca



Thank you!



www.solution-s.ca



SOLUTION-S

29-2450 Lancaster
Ottawa, Ontario K1B 5N3
T 613 249-8593
F 613 249-0198
info@solution-s.ca
www.solution-s.ca

www.solution-s.ca