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our brains

- understanding
children's development
and:
- brain architecture
 - serve and return
 - toxic stress
 - addiction and mental health



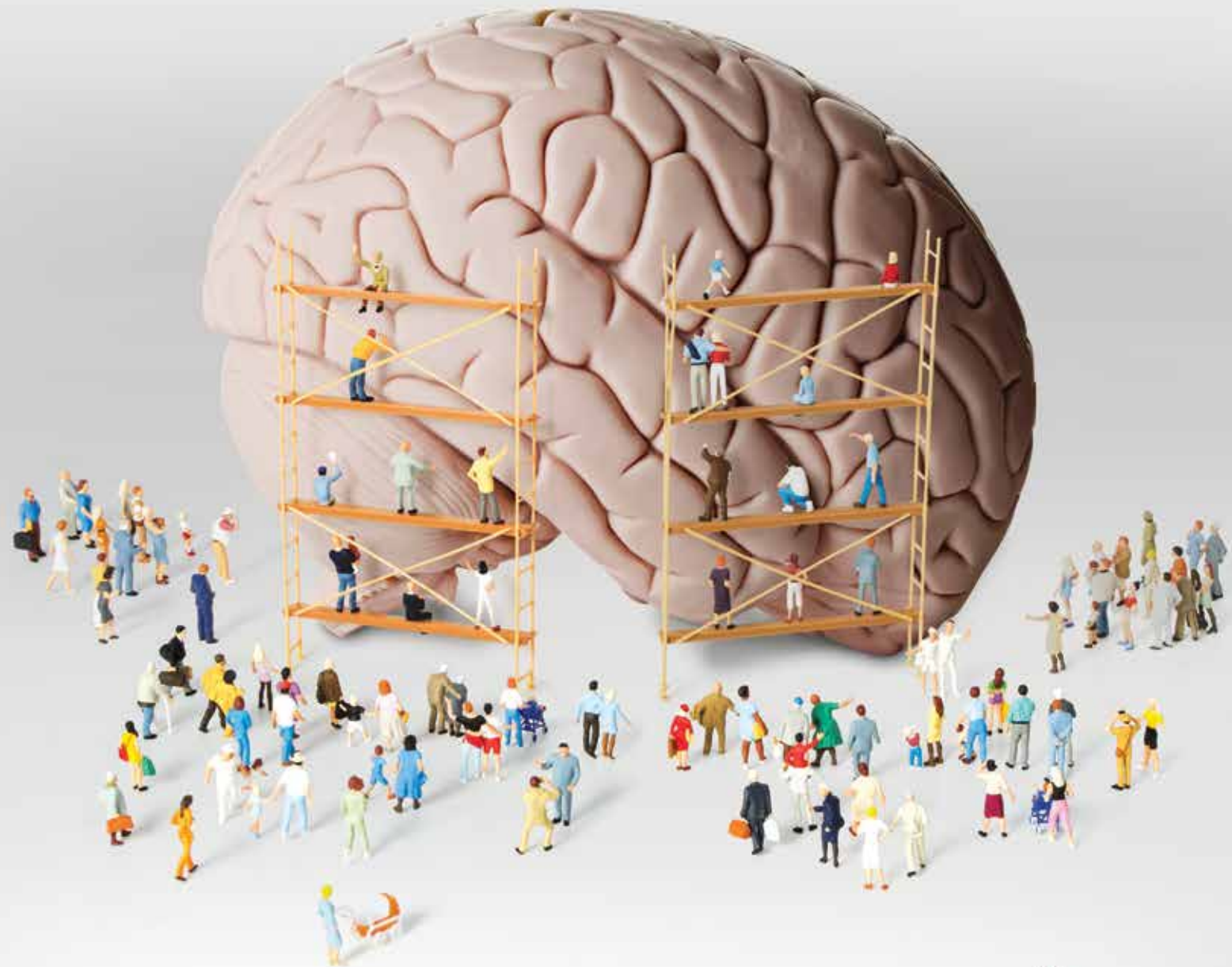
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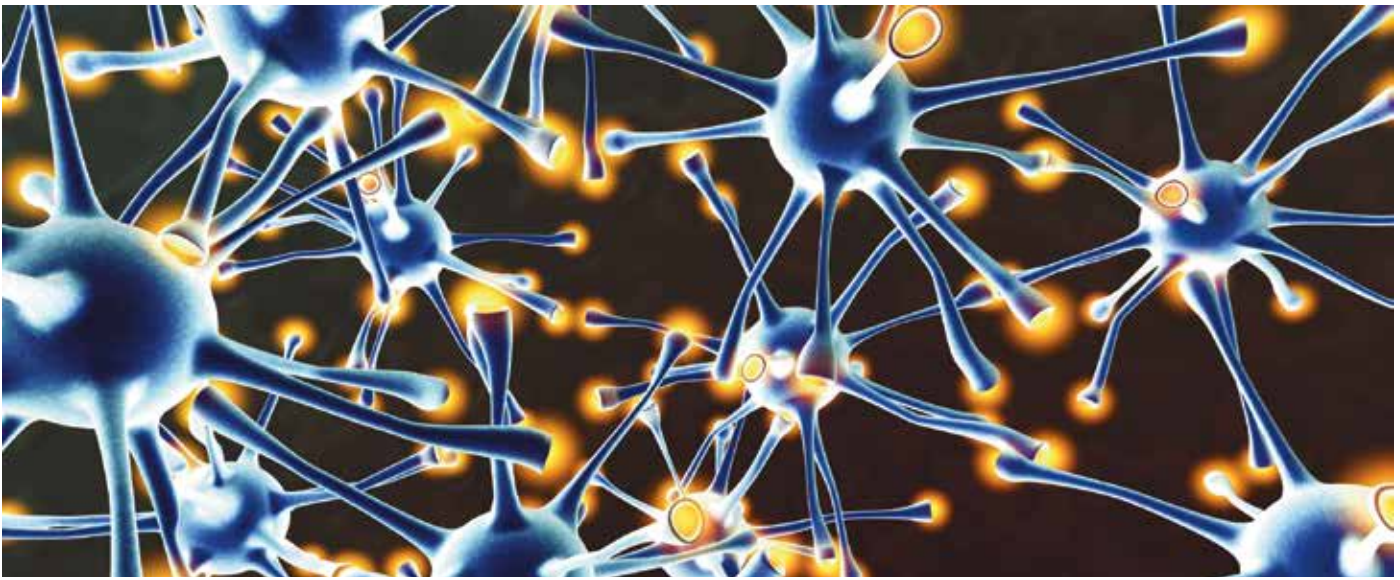
Help Children Build a Foundation for Lifelong Health

Science tells us that the experiences we have in the first years of our lives actually affect the physical architecture of the developing brain. Visit us online to find out how we can build better brains in our communities.



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Making the brain and brain science understandable

Early in 2012, *Apple* magazine and the Norlien Foundation, through the Alberta Family Wellness Initiative (AFWI), set out to tell Albertans about our brains.

Our organizations wanted to share a growing body of new evidence about brain science, especially as it relates to early childhood development, mental health and addiction. For months we discussed how to put the knowledge and understanding we'd gathered into simple, meaningful stories.

Brain science, like the brain itself, is complicated. Our goal was to make it understandable to a broad range of people. Within a few weeks of circulating the issue in September 2012, we knew we had struck a chord in the community. Parents, childcare providers, conference groups and


government departments were requesting dozens, even hundreds and thousands of copies for their families, staff, events and stakeholders. The requests have continued to roll in ever since.

To meet the ongoing demand, we've published this special edition. It contains every story in original issue, plus, we've updated a couple of stories and added some new information in places.

The growing body of knowledge around early brain development is helping you, parents, families, researchers, health-care and child-care providers, caregivers, academics government and individuals talk about early childhood development, mental health and addictions in our province. It's important these conversations are

informed, current and evidence-based.

By knowing more about how the brain develops—and how it can change—we will be better able to help people reach their potential and aspirations. Healthy brains literally mean healthy communities.

Special thanks to the Norlien Foundation and the Alberta Family Wellness Initiative for funding this special edition. If you would like to receive more copies, please contact the Foundation by email at info@norlien.org or by phone at 403-215-4490. 

— Paula Tyler & Terry Bullick

Paula Tyler is the president of the Norlien Foundation and executive director of the Alberta Family Wellness Initiative. Terry Bullick is the publisher and editor of *Apple*.

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COVER:

Serve and return

Ibrahim Rafih with grandson Adam Rafih

PHOTOGRAPHED FOR APPLE
BY EWAN NICHOLSON



The power of dads

Involved fathers have a powerful influence in children's healthy development

BY LUCAS WARREN



When growing up is hard to do

Adverse childhood experiences can affect relationships and health for a lifetime

BY CYNTHIA DUSSEAULT

The parent child bond

For children, relationships with their parents and other caregivers are central

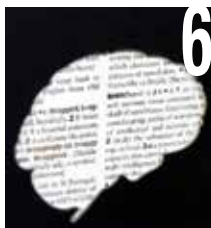
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Mental health matters to kids, too

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31 ways to raise healthier children

Parents, caregivers and communities all play a role in healthy development

BY HEATHER KIPLING AND TERRY BULLICK



Your ever changing brain

New research shows the brain's ability to rebuild itself extends far beyond the first two decades of life

BY DEBORAH LAWSON



Along the faultlines: reframing our understanding of addictions

Science is showing us that some brains are more vulnerable to addiction than others

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Dr. Tania Oommen





Unlocking new knowledge about our brains

Star Trek creator Gene Roddenberry famously called space the final frontier. But surely the next frontier is our brains. For all we know about them, much remains to be explored.

This issue of *Apple* is dedicated to new knowledge about our brains and how they develop throughout life. Our goal is to help you better understand brain development and what it means to your life, your family and your entire community. We also hope to erase some common misperceptions about the brain.

The strength of a society—and its ability to be prosperous and sustainable—depends on how well it supports the skills and capacities that develop in children’s early years. This development influences everything from how well children do in school to how healthy they are to how well they are able to participate in the workforce. When a community invests in its children, it is investing in its prosperity and its future.

Thanks to advances in science, we are learning more about the importance of healthy brain development and early childhood experiences. Our brains begin developing very early, literally from the moment of conception. The first year of life is a time of rapid and intense growth in the brain, and while many skills and capacities are established by age five, brain development continues into the adult years.

Development is affected by what we’re born with (our genes) and what we experience (our environments). We now know our genes and environments interact, and experiences can actually switch genes “on” or “off.” That interaction during childhood lays the foundation for brain development and lifelong learning, behavior and health.


Early experiences literally shape the brain’s architecture, as each new skill builds on the ones that came before. That structure can be strong, if early experiences are stimulating and positive, or it can be more fragile if they are not.



A major factor in this process is the “serve and return” relationship between children and their parents or other caregivers. Much like a game of tennis or volleyball, one person “serves” a word or action, and the other responds. This process means that children need stable, caring, and stimulating relationships with the adults in their lives, in order to build strong brain architecture.

The body’s response to stress can also affect the brain’s architecture (see *When Good Stress Goes Bad* on page 12). Stress comes in three forms—positive, tolerable and toxic. Some stress is part of healthy development, but when the body and brain must frequently respond to chronic or excessive stress or adversity, it can harm a child’s brain and other organs. This can increase the lifelong risk of physical and mental health problems, from heart disease to depression and addictions. The possible effects of toxic stress are, however, greatly reduced when children have supportive adults to help them cope.

While the brain is able to change (an ability called plasticity) for a lifetime, it is much easier and more effective to make changes earlier in life. It is less costly to individuals, families and society to get brain development right in the early years than it is to try to fix it later.

During the past three decades, scientists and researchers around the world have gained tremendous insight and knowledge into our brains and the interaction of nature and nurture. Here in Alberta we have become world leaders in gathering this knowledge, making our communities stronger and ensuring a healthy future for our children. We hope you enjoy this issue, and we encourage you to share your thoughts about it on our Facebook page at facebook.com/applemagca. 

— The *Apple* team

Glossary

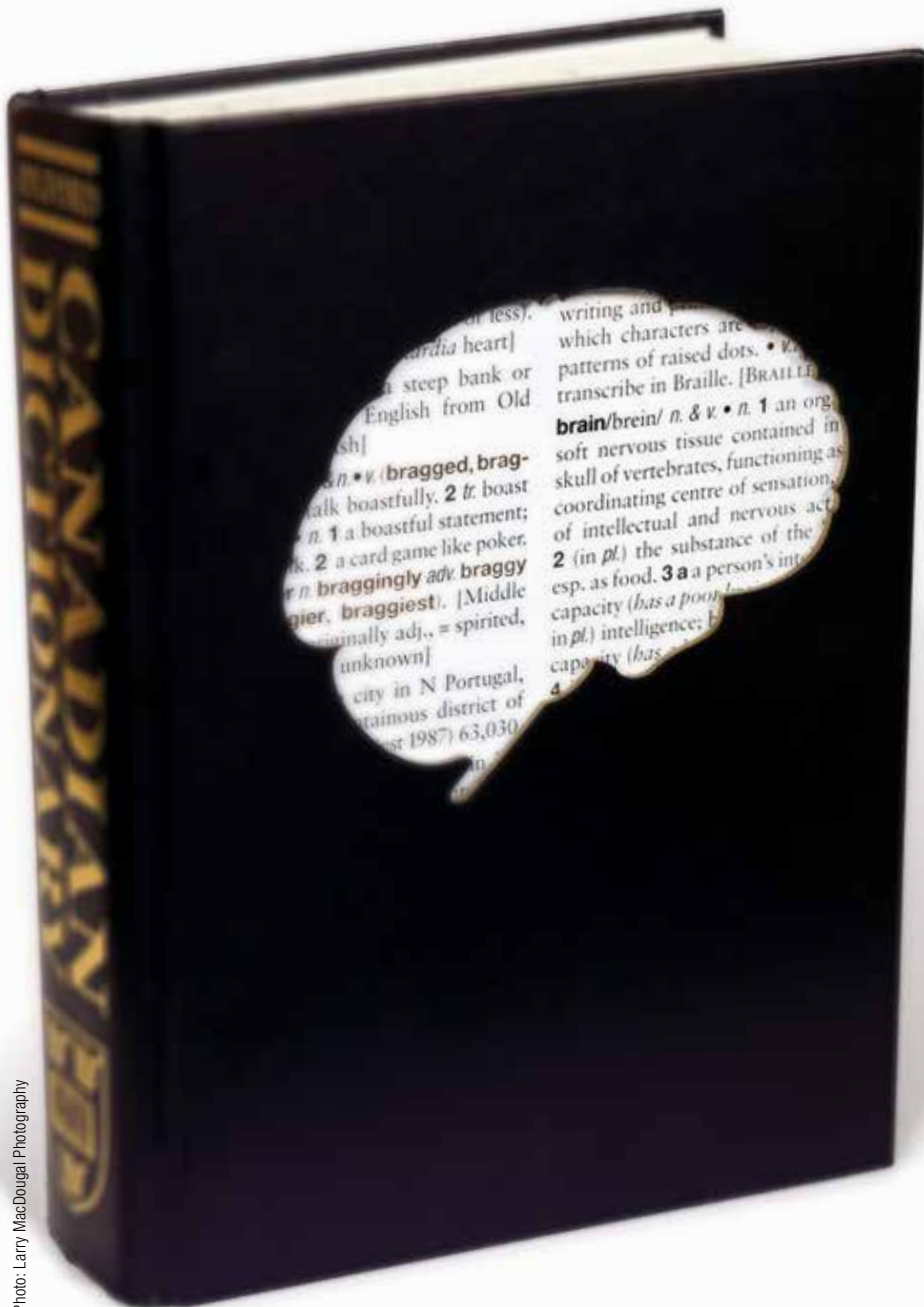


Photo: Larry MacDougal | Photography

The following terms and concepts are used throughout this issue.

Addiction: A chronic condition that affects the brain's reward and motivation systems. Well before an addiction takes hold, brain development plays a critical role in a person's susceptibility to addiction in the first place. Early childhood experiences, as far back as the pre- and postnatal periods, can alter brain architecture in ways that may make addiction more likely.

Brain: A major and powerful organ, your brain controls your senses, motion, speech, thought, memory, intellect, thinking and imagination.

Brain architecture/development: The basic architecture of the brain is like the construction of a home — building begins with laying the foundation, framing the rooms and wiring the electrical system in an orderly way. Our early experiences literally shape how our brains get built. A strong foundation in the early years increases the chances of a healthy life. A weak foundation increases the risk of problems later in life. The most intense time of brain development is during the first few years of life.

Brain plasticity: The brain's capacity to change as a result of input from the environment. Brain circuits are built in a bottom-up sequence over the course of the developmental period. As a general rule, the brain is most plastic during the early period of development, meaning that during this time it is the most vulnerable to harm and the most capable of recovery. As brain circuits stabilize, they become increasingly difficult to alter.

Cognitive development: The ability to understand the world around you; it involves memory, perception, thinking, attention and language skills.

Emotional development: The understanding of different emotions, such as anger, sadness and happiness, as well as the ability to regulate these emotions.

Executive function: A learned ability. Just as air traffic controllers enable many planes to use an airport without

colliding, so executive function equips us with the ability to remember, focus, plan and respond appropriately to diverse circumstances. “It’s foundational to learning,” says Mount Royal University Child and Youth Studies professor Dawne Clark. “It’s not the content, but the processes that allow us to learn.”



Faultlines: The metaphor of “brain faultlines” is used to describe new scientific knowledge about how addictions form. Like a faultline in the earth, people’s brains can develop small cracks. In some cases, faultlines appear as the brain develops. They can also develop over time as people experience toxic stress. Other times, people may have been born with faultlines. Just as faultlines in the earth’s core can set off earthquakes, faultlines in the brain can affect brain architecture. This physical response is leading us to look beyond the individual to the bigger picture and to identify a whole host of possible developmental causes.



Genes: Our genes determine which traits we are born with, but factors such as relationships with family and friends, family income and experiences determine whether or not some traits will be activated. Experiences operate like a signature on the genes, setting up later behaviour. Dr. Bryan Kolb, a professor in the Department of Neuroscience at the University of Lethbridge, says the development of the prenatal brain reflects a complex interplay of genes and experiences.

Healthy relationships: Vital to building sturdy brain architecture, healthy relationships are built on serve and return interactions: trust, respect and mutual care. People in healthy relationships share similar values and interests and are able to change and grow. They also communicate and feel safe and happy with one another.

Levelness: Levelness helps tables become stable, useable and functional. It plays the same role in children’s mental health. Level “floors” mean a child is in a loving and nurturing environment with access to good health and nutrition. Sloped “floors” mean children are exposed to adverse childhood experiences and don’t have access to key resources.

Mental health: The World Health Organization defines mental health as a person’s emotional and biological well-being. It is influenced by social, environmental and biological factors.



Parents and caregivers: Throughout this issue reference to parents or caregivers (which for this issue are defined as family members and other important adult figures in children’s lives) are often interchangeable.



Physical development: The growth of a child’s body. As physical development proceeds, the child goes from sitting up, to crawling, standing, walking and running. Eye/hand coordination increases, and motor skills are developed.

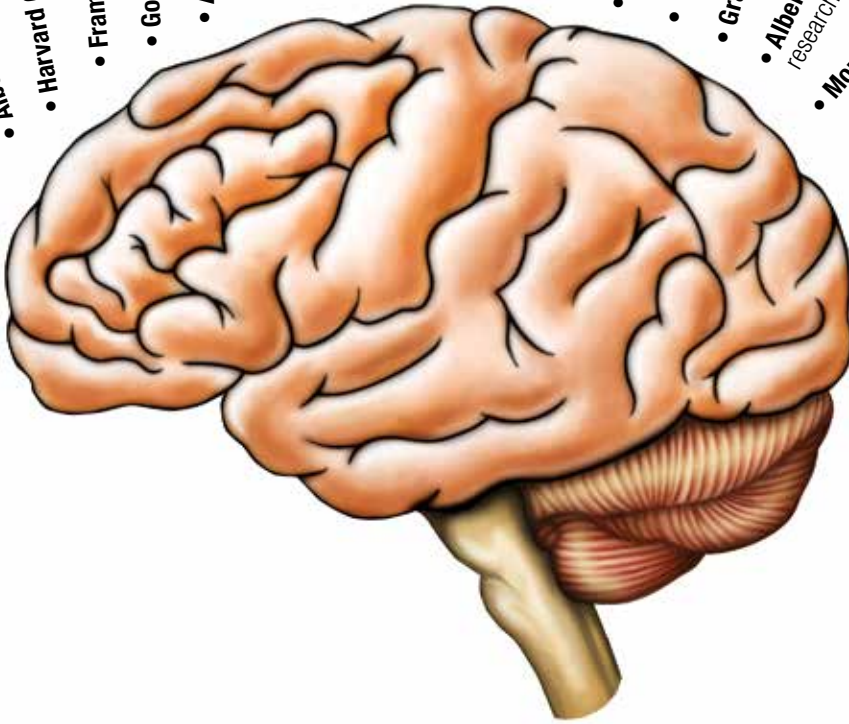
Serve and return: The brain is built by an interactive process known as serve and return because it’s very much like a game of tennis or volleyball. A child begins with a gesture or sound — the “serve” — and you respond with the “return.” A baby smiles at you and you smile back. You gurgle and he gurgles back. A toddler pulls at your leg for attention and you bend down to reassure her. When parents or other caregivers respond sensitively, a child is surrounded by positive serve and return exchanges. Serve and return exchanges take place throughout our lives, but are critical in early childhood because they’re the building blocks for a healthy brain.



Social development: The ability to interact with others, as well as the ability to form and maintain relationships with others.

Stress: We experience three types of stress. Positive stress can be motivational; you feel it when you are getting ready for work or playing a game of hockey. This type of stress helps us deal with adverse situations and become resilient. Tolerable stress is the result of a serious event that eventually subsides, such as when a loved one dies, or being in a car crash. It is often overcome with the help of supportive relationships with family, friends and others in the community. Toxic stress is chronic, unremitting and unpredictable. It can be harmful, especially to children, and is often the result of neglect, abuse or extreme deprivation.

Stressors: Events and experiences that cause stress in an individual. They vary widely for person to person and their affect varies depending on the support network an individual has.

- 
- **Norlien Foundation:** norlien.org
 - **Alberta Family Wellness Initiative:** albertafamilywellness.org
 - **Alberta Health Services:** albertahealthservices.ca
 - **Harvard Center on the Developing Child:** developingchild.harvard.edu
 - **Frameworks Institute:** frameworksinstitute.org
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 - **Grant MacEwan University:** macewan.ca
 - **Alberta Centre for Child, Family and Community Research:** research4children.com
 - **Mount Royal University:** mtroyal.ca

Behind our brains

Some of the organizations that are working together to build a network to help Albertans understand brain development.

(Also see Building Community by Sharing Information on page 16.)

Alberta's source for brain development information

AFWI website is geared to creating “a common framework of understanding”

Science is revealing more and more about the connections between early brain and biological development and our physical and mental health all the time.

Those discoveries, however, are only truly meaningful when we know what they mean in our everyday lives.

The Alberta Family Wellness Initiative was founded to give Albertans “a common framework of understanding—and to help turn research into policy and practice.

One of the most powerful ways the initiative does this is through its website (albertafamilywellness.org). The site offers a wide variety of information and examples of

how Albertans can use, and are using leading-edge science in early childhood development, mental health and addiction.

Geared to families and caregivers as well as to health-care providers, academics and government officials (with distinct sections for each), the site explores topics such as Alberta’s addiction and mental health strategy, investing in early childhood development and recovery from addiction. It also tackles the misperceptions that often exist with new scientific research and shows how the AFWI is working to give Albertans health information they can understand—and trust.

Curious families and individuals will find the site is a one-stop information source for everything from brain architecture and development to the prevention, intervention and treatment of addiction. Content is often complemented by videos, learning modules and recorded lectures from the AFWI’s ongoing symposia. Plus, the site is the ideal web source for learning more about many of the concepts covered in this issue of *Apple* magazine.

You can explore more at albertafamilywellness.org. 

— Terry Bullick

The importance of early childhood development

Sturdy brain architecture supports lifelong wellness

Our brains are always developing, from the moment of conception and throughout adulthood, with some of the most important development from birth to about six years old.

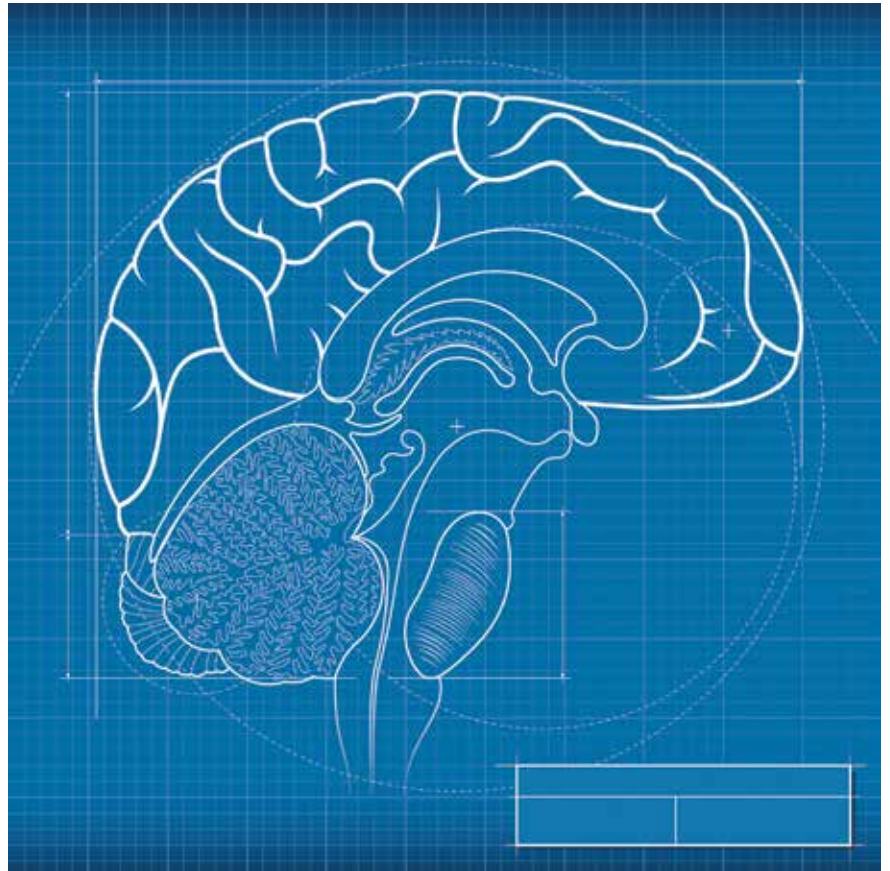
The basic architecture of the brain is like the construction of a home—building begins with laying the foundation, framing the rooms and wiring the electrical system in an orderly way. Our early experiences literally shape how our brains get built. A strong foundation in the early years increases the chances of a healthy life. A weak foundation increases the risk of problems later in life.

We are born ready to learn about the world around us—how we do that depends on our environment and experiences early in life. Within the first six months of life, our language skills begin to develop and we recognize the spoken word and people around us. By the time we're toddlers, we're using words and can walk.

Our higher thinking functions, such as reasoning and planning, develop next, and over the next few years, we begin making more complex connections between different parts of the brain.

"Any experience a child has—whether he's exposed to violence or supportive care, or has enough to eat or has toys to play with—plays a role in determining the circuitry of his brain," says Dr. Deborah Dewey, a professor in the Departments of Pediatrics and Community Health Sciences at the University of Calgary.

Positive serve and return experiences



(see Serve and Return on page 11), such as cuddling or reading to a baby, can stimulate the brain's cells responsible for language, sensory, motor and social skills.

The areas of the brain are intertwined, and development in one part of the brain cannot take place without affecting another.

"The brain isn't organized by a dictionary with words like social and cognitive located in different places," explains Dr. Bryan Kolb, a neuroscientist and professor in the

Department of Neuroscience at the University of Lethbridge. "These areas overlap considerably, affecting a whole range of processes. By improving one, you improve the other."

For optimal brain development in the early years, Dewey says a child needs nurturing and stable relationships, and that those relationships can be with a parent, grandparent, childcare provider or other caregiver. [a](#)

— Dawna Freeman



Serve and return

Sensitive, responsive back and forth exchanges are the building blocks of children's early years

The building blocks of brain architecture are what we're born with (our genes) and the lives we lead (our experiences).

The brain is built by an interactive process known as serve and return because it's very much like a game of tennis or volleyball.

A child begins with a gesture or sound—the “serve”—and you respond with the “return.” A baby smiles at you and you smile back. You gurgle and he gurgles back. A toddler pulls at your leg for attention and you bend down to reassure her.

When parents or other caregivers respond sensitively, a child is surrounded by positive serve and return exchanges.

Serve and return exchanges take place throughout our lives, but are

critical in early childhood because they're the building blocks for a healthy brain, says Carole Anne Hapchyn, an infant psychiatrist with Child, Adolescent and Family Mental Health (CASA) in Edmonton.

“The quality of that back and forth connectedness builds a baby's brain,” she says. This structural building is known as brain architecture.


Serve and return exchanges are also needed for children to regulate their emotions and develop language, gross motor skills (such as learning to sit, stand and walk) and fine motor skills (such as learning to hold a pencil and tie shoes). Some genes are switched on and off by serve and return exchanges.

When you soothe and calm your child through serve and return interactions, your child also learns

a key life lesson—relationships and connections with others are essential.

Without caring and nurturing serve and return exchanges, the architecture of the brain can be affected, as these experiences play a key role in how a child learns, feels and behaves as well as his overall health and relationships with others.

“If those interactions are not taking place, the brain cannot develop properly,” Evelyn Wotherspoon, a clinical social worker and infant mental health specialist, says.

“Healthy infant and child development is all about relationships,” Wotherspoon adds. “No child lives in a vacuum.” 

— Colleen Biondi with files from Terry Bullick

When good stress goes bad

Community support can buffer the effects of toxic stress



Stress: we've all felt it. Our hearts race, palms moisten and muscles clench. While some stress is normal and beneficial, ongoing stress can affect our mental and physical health.

We experience three types of stress.

Positive stress can be motivational; you feel it when you are getting ready for work or playing a game of hockey. This type of stress helps us deal with adverse situations and become resilient.

Tolerable stress is the result of a

serious event that eventually subsides, such as when a loved one dies, or being in a car crash. It is often overcome with the help of supportive relationships with family, friends and others in the community.

Toxic stress is chronic, unremitting and unpredictable. It can be harmful, especially to children, and is often the result of neglect, abuse or extreme deprivation. Toxic stress is never good.

"In abusive or neglectful situations,

a child is stressed because she cannot predict when something bad will happen and has no control to stop something bad from happening," says Dr. Matthew Hill of the University of Calgary's Hotchkiss Brain Institute.

"As such, toxic stressors produce a sustained state of stress that goes on for long periods and can result in a steady release of stress hormones."

As well, the neural circuits for dealing with stress are particularly

plastic, or malleable, before birth and into early childhood. Our experiences shape how these circuits turn on and off and operate. Toxic stress can make both neural circuits and hormone systems over- or under-react when faced with stress throughout life.

Hill says the persistent nature of toxic stress “can leave a biological fingerprint of damage.”


Over time, toxic stress’s wear and tear effect on the brain can lead to a range of disorders and illnesses, including hypertension, type 2 diabetes, obesity, metabolic syndromes and inflammatory conditions such as asthma, arthritis and irritable bowel syndrome. Toxic stress can also affect brain architecture, sometimes leading to learning delays, problems with memory recall and mood, depression, addiction and anxiety disorders. In extreme cases, toxic stress may result in the development of a smaller brain.

The good news is toxic stress can be avoided when proper supports are in place in the community. “Social support—for parents and for children—is the single most important determinant of health and healthy

Toxic stress is chronic, unremitting and unpredictable. It can be harmful, especially to children, and is often the result of neglect, abuse or extreme deprivation

child development,” says Dr. Nicole Letourneau, Norlien/ACHF Chair in Parent-Infant Mental Health and the Alberta Research and Education for Solutions to Violence and Abuse (RESOLVE) coordinator. “Support can

buffer the effects of stress. Stress is only toxic in the absence of support.”

Such support comes not only from parents and other caregivers but from healthy communities with safe schools, institutions and public spaces that nurture both children and parents. Letourneau adds that “finding someone to listen to us and provide emotional support helps restore our emotional energy that we can then make available to our kids.” 

— Kathryn Ward

 **To learn more about stress and Hill’s or Letourneau’s research, visit the Alberta Family Wellness Initiative website at albertafamilywellness.org**

If you or someone you know needs help to deal with toxic stress, call Health Link Alberta at 1-866-408-LINK (5465)

We’re not hard to find. Apple is available across Alberta, including in these AHS facilities:

Fairview Health Complex | QEII Hospital | Elk Point Healthcare Centre | Rockyview Hospital | Vulcan Community Health Centre | Lois Hole Hospital | Devon General Hospital | Sturgeon Community Hospital | Drayton Valley Community Health Centre | Canmore Hospital | Rutherford Health Centre | Evansburg & District Health Centre | Alberta Children’s Hospital | Foothills Medical Centre | Hanna Healthcare Centre | Coronation Hospital & Care Centre | Olds Hospital & Care Centre | Northwest Health Centre | La Crete Continuing Care Centre | St. Theresa General Hospital | Brooks Mental Health Clinic | Royal Alexandra Hospital | Okotoks Health and Wellness Centre | Willow Creek Continuing Care Centre | Red Deer Regional Hospital |

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Photo: Norlien Foundation

Building community by sharing information

Network strives to see brain research applied

Recent research into

understanding how children's early experiences lay the foundation for brain development and health throughout life is just the beginning.

To make this new knowledge come to life, a network of experts is working with Alberta health-care providers, academics, government and Albertans to help them understand what it means to them and their communities. At the centre of this network is the Alberta Family Wellness Initiative (AFWI). The

AFWI's activities are based on three concepts:

- The connection between early childhood brain development and future addictions and other mental health outcomes
- The knowledge that people can be addicted to behaviours such as working, sex and eating, as well as alcohol, drugs and gambling
- The fact that the human brain can change.

The AFWI is also working to close

the gap between scientific knowledge about addiction as a brain disease and current policy and practice.

To this end, it partnered with the Government of Alberta and Alberta Health

Services to host two symposia a year from 2010 to 2012: one called Early Brain and Biological Development and the other Recovery from Addiction. The symposia promoted greater awareness of current scientific research and what it means to government

policy and health-care delivery. They were attended by diverse experts and stakeholders, from researchers to health practitioners to policy makers, from across Alberta and North America. For example, more than half the 100-plus participants in the annual Recovery from Addiction symposium are AHS employees who take what they learn at the symposium and weave it into their programs and services.

The AFWI will launch a new strategy in the fall of 2013, which will unfold over the next two years. This strategy will focus on sharing the brain story with health professionals, government officials, educators and community agencies. The story will discuss how Alberta's collective knowledge can be used to improve outcomes for children and families, and would connect the communities of science, policy and practice. The strategy starts October 2013 with a new symposium in Edmonton called Accelerating Innovation: Telling the Brain Story to Inspire Action.

The symposium will focus on how to better help children affected by addictions and toxic stress that are passed from one generation to the next. The objectives are to:

- Link the science of brain development with the science of mental health and addictions
- Gain a common understanding of these types of stress and addictions and what they mean to individuals and communities
- Foster "communities of purpose" that will inspire the change and apply the knowledge needed to prevent, intervene and treat mental health and addiction issues throughout life.


The fall symposium's presenters include Jack P. Shonoff, director of the Center on the Developing Child at Harvard University; Pat Levitt, a professor of neuroscience, psychiatry and psychology and the pharmacy director at the University of California, Berkeley; and George Koob, committee chair, Neurobiology of Addictive Disorders at the Scripps Research

Institute and other world leaders in these topics. Presentation topics will include The Frontiers of Innovation project, a new platform to create better outcome for children across the lifespan; how public policies can help support or derail healthy children development; and interventions for family and how they support healthy recovery. A summary of the symposium's presentations will be posted on albertafamilywellness.org.

The AFWI's ongoing major partners include the universities of Alberta, Calgary and Lethbridge, the Association of Faculties of Medicine

A new strategy will unfold in the next two years and will focus on sharing the brain story with health professionals, government officials, educators and community agencies

of Canada, the National Science Council, the Center on the Developing Child at Harvard University (which has a mandate to improve the future lives of children all over the world) and the FrameWorks Institute (a Washington, D.C.-based organization that helps translate scientific findings into easy-to-understand concepts). Other AFWI partner organizations include the Alberta Children's Hospital Foundation, Calgary Police Services, United Way, Upstart, a number of primary care networks and several Alberta government departments: Family Justice Services, Aboriginal Relations, Education and Human Services.

These organizations are all dedicated to building community through sharing information on early brain development and life-long health. 

— Frankie Thornhill with files from the Apple team

 **To learn more, visit the Alberta Family Wellness Initiative at albertafamilywellness.org**

THE CORE VALUES

The core values behind AFWI's programs include:

- A commitment to Alberta families by connecting the best minds from around the world with the brightest Albertans to solve complex problems
- Proactively connecting scientists, researchers, clinicians, policy makers and funding organizations to achieve policy and practice outcomes
- Supporting stakeholders to apply research into early brain development to address addiction and other negative physical and mental health outcomes.

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Exercising your brain

Your brain loves to work out both physically and mentally



A growing body of research is finding your brain needs (and benefits from) physical and mental exercise—at any age.

Mentally, you can give your brain a workout with music, art, crossword puzzles, memory games and even stimulating conversations.

Physically, it doesn't matter if it's walking, jogging, or yoga, as long as it gets your heart pumping and your blood moving. One theory is that the increased blood flow to the brain due to exercise helps increase thinking and memory skills, and could protect against dementia, stroke and Alzheimer's disease.

In April 2012, the *New York Times Magazine* reported: "Research also suggests that exercise prompts increases in something called brain-derived neurotropic factor, or BDNF, a substance that strengthens cells and axons, fortifies the connection among neurons and sparks neurogenesis."

Physical activity can also relieve symptoms of depression, attention deficit hyperactive disorder (ADHD) and other anxiety disorders. This is because it releases dopamine, serotonin and norepinephrine—or, the "happiness" chemicals—into the brain. "Think of exercise as medication,"

says Dr. John Ratey, an associate clinical professor of psychiatry at Harvard Medical School. Ratey spoke in 2010 at Calgary's Mount Royal University about how exercise, fitness and play affect the brain and improve emotional, psychological and cognitive health.

"For a very small handful of people with attention deficit/hyperactivity disorder (ADHD/ADD), it may actually be a replacement for stimulants, but, for most, it's complementary—something they should absolutely do, along with taking meds, to help increase attention and improve mood."

Graham Matsalla, a health promotions facilitator with Alberta Health Services, says that you don't necessarily need to go to the gym to

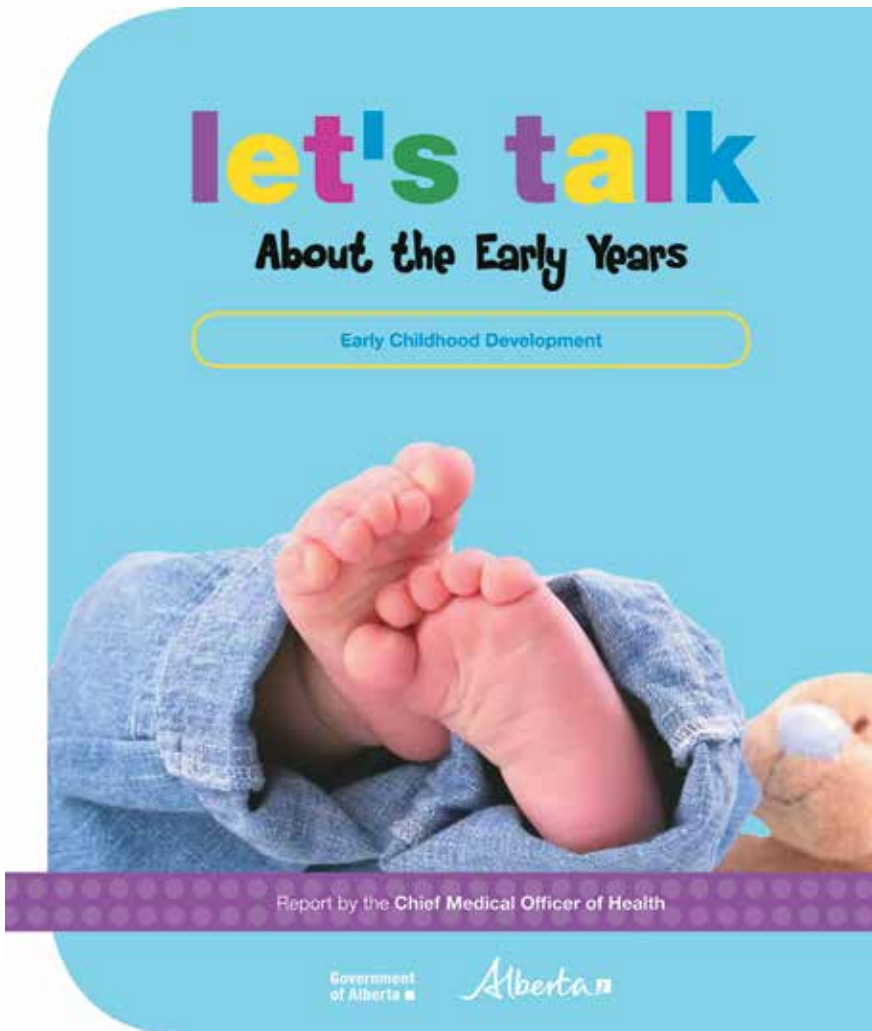
get your exercise; you can make small changes to add physical activity to your day.

Taking the stairs, walking to the grocery store, and parking farther away are all different ways to increase your daily physical activity.

The Canadian physical activity guidelines suggest a minimum of 60 minutes of moderate-to-vigorous daily physical activity for children five to 17, and 20 minutes of moderate-to-vigorous daily physical activity for adults 18 and older.

So next time you go for that run or play the piano, remember, your brain will thank you. [@](#)

— Yasmin Jaswal



A conversation about the early years

Scientific research over the past decade is uncovering more and more about how a child's first five years are vitally important to her future. What happens during these years can have a profound effect on her well-being as an adult, including whether she develops mental health problems, addictions or whether she leads a productive, well-balanced life.

The importance of early childhood development is the focus of *Let's Talk About the Early Years*, a 103-report published by the Office of the Chief Medical Officer of Health (OCMOH) in 2011. Now in its third printing, *Let's Talk About the Early Years* is an informative feast for the eyes that's easy-to-read and richly illustrated. The report includes many of the topics

and concepts discussed in this issue of *Apple*.

"So much has been learned in the past decade, I thought it was important to update people," says Dr. Andre Corriveau, the Chief Medical Officer of Health for Alberta from 2009 to 2012, who now fulfils that role in the Northwest Territories. "I wanted to recognize all the work being done and add the voice of the Office of the Chief Medical Officer to raise the profile of the issues. The minute we stop paying attention to it, we suffer as a society."

Many individuals and groups have embraced the report, says project manager Louise Forest. They include the Psychologists' Association of Alberta, the Alberta Child Care Association and the Foothills Children's Wellness Network.

The report is also being used by several departments with Alberta Health Services as a reference. [@](#)

— Frankie Thornhill

 **To download your own copy of *Let's Talk About the Early Years*, see the online version of this story at applemag.ca**



Sharing the wisdom of Aboriginal grandmothers

A new project will offer parenting advice that is a combination of science and tradition

For generations, Aboriginal women in Alberta have passed on pregnancy and parenting advice to their daughters: be careful what you eat, what you feel and what you think during your pregnancy because it will affect the baby. When the baby comes, cradle him on your back or swaddle her in front to create that mother/baby bond.

The rationale for this age-old practice is based on native tradition, common sense and intuition. But when Lillian Parenteau attended an Alberta Family Wellness Initiative (AFWI), she gained a greater understanding of the connection between early childhood nurturing and brain development.

“We learned about the science and biology that accompanies what has


historically been passed down in our communities,” says Parenteau, CEO of Region 10 Métis Settlements Child and Family Services Authority in Edmonton.

She came away with insights into key concepts such as brain architecture and serve and return interactions. Now, Parenteau is working to bring this new understanding to the Métis settlement of Buffalo Lake with a pilot project called Grandmother Wisdom.

With the help of staff at Blue Quills First Nations College, near St. Paul, and the AFWI, Parenteau will talk to women at Buffalo Lake this fall about how science and tradition can come together in the project. She says it will be important for the project to incorporate storytelling,

demonstrations, fun and feasting. “We have strong, young women here who are on a healing path,” says Parenteau. “They are going to change the dynamic for our community.”

That change will be welcomed. “We have had interruptions in our history of that kind of nurturing,” she says, referring to the prevalence of Fetal Alcohol Spectrum Disorder (FASD) among First Nations people and the above average number of Aboriginal youth in government care.

Grandmother Wisdom will pass along the old knowledge with the new knowledge, Parenteau says, “and build a strategy to ensure babies are born with the best chances in life.” 

— Colleen Biondi

Campaign promotes connecting with kids

Helping children helps them develop the skills to cope with difficult times

In 2012, Addiction Services staff with Alberta Health Services developed a campaign reminding adults of the importance of giving children someone to lean on.

Simple Connections, Stronger Kids was a series of public service announcements that launches this fall in Southern Alberta. The campaign was inspired by an Alberta Family Wellness Initiative (AFWI) symposium on early childhood development.

The staff members put the campaign together after learning about adverse childhood experiences (ACEs). When ACEs outweigh children's positive experiences, they can damage brain architecture, leaving them at higher risk of attempted suicide, drug use and unwanted pregnancy. Later in life, these children are more prone to develop mental health issues such as depression and addiction. A child's response to an ACE is often affected by adult care, support and attention.

"Simple things are a big deal to kids," Thomas Mountain, an Addiction Services manager in the South Zone, says. "The more we spend time with and acknowledge youth, the more



Photo: Simple Connections, Stronger Kids

resilient they are to addressing difficult times in their lives."

Being there when a child needs you, or just saying hello to a child, goes a long way. This could mean eating lunch with a child, asking how her day at school was or listening to her problems.

Studies from the Center on the Developing Child at Harvard University have shown that children can better cope with ACEs when a parent or adult caregiver is there to help. This means that by creating a strong bond with a child, an adult can help them handle their stress in a healthy way.

Mountain and his team worked alongside staff with the Addiction

Prevention Program on the campaign, and believe their work is an important step towards helping kids be healthier.

"There are all sorts of things we do naturally for physical protection," Mountain says. "By being important to a kid in your life, you can help him face the challenges or the risks he will have in his life as well."

Mountain hopes that the advertisements his team have created will catch on across the province.

The ads aired on TV and radio stations across Southern Alberta, including in Medicine Hat, Taber and Lethbridge. [@](#)

— Yasmin Jaswal

Overcoming loneliness

Healthy relationships help avoid the sad, empty feelings

Sometimes you want to be alone, but other times being alone can be, well, lonely.

Loneliness has many causes, and can be felt at any age. The feeling is usually short-lived, but if it lasts over long periods of time, it can cause physical and mental problems—for both adults and children.

“People who feel lonely may exhibit a number of symptoms,” says Donna Koch, the executive director of Community Health in Alberta Health Services’ North Zone. “For example, they either don’t eat or they overeat, which can lead to chronic conditions such as obesity.”

Koch also says people who deal with loneliness have poor sleep patterns, interact less with others and stop doing their regular activities.

These symptoms can lead to conditions such as depression and addictions. But it’s not a one-way street. Depression and addiction can lead to loneliness as well.

One way to effectively combat loneliness is to build healthy relationships with family, friends, coworkers and community members. A healthy relationship is built on serve and return interactions: trust, respect and mutual care. People in healthy relationships share similar values and



interests and are able to change and grow. They also communicate and feel safe and happy with one another.

Healthy relationships can be built (and loneliness beaten) in any number of ways: you can join an outdoor club, volunteer at a local school, food bank or hospital, or play or coach sports. You can also walk regularly with friends or the family pet—not only are pets affectionate, they can also connect you to other pet owners.

If your loneliness becomes unbearable, doctors and therapists can

help. Depression is a brain disease and can be successfully treated.

And if you are concerned about someone else’s loneliness, Koch suggests checking in on them regularly while still respecting their space. ^a

— Yasmin Jaswal

*** One way to effectively combat loneliness is to build healthy relationships with family, friends, coworkers and community members**



Help for parents feeling blue

Q Where can parents who feel “blue” or depressed go?

A Lots of parents experience the “baby blues” after the birth, adoption or loss of a baby. In fact, up to 90 per cent of women can feel overwhelmed, down or worried in the first few weeks postpartum. Men can also feel blue. The feelings are normal and don’t usually require intervention or treatment.

Postpartum depression or anxiety (PPD and PPA) are serious illnesses that can affect almost 20 per cent of new parents, particularly women. They seem to be brought on by changes in hormone levels and their risk increases if parents have had depression before; are not well supported by their partners, friends, family or community; have a sick or colicky baby; or have other stressors in their lives.

“PPD and PPA are more severe than the ‘baby blues,’” explains Dr. Lisa Gagnon, a psychiatrist with the Women’s Mental Health Clinic at the Foothills Hospital in Calgary. “People suffering from them may have a drastic change of mood, lose interest in things that previously brought them joy or experience changes in sleep patterns and appetite.”

The Center on the Developing Child at Harvard University says serious depression in parents and caregivers can influence the well-being of the children in their care. When children grow up in an environment of mental illness, their brain architecture may be seriously weakened, and this can have implications for children, families and communities.

Gagnon says it is important for parents to know that depression is a brain disease, and not of their own making. Many resources and strategies

are available to help new parents recognize and manage PPD and PPA. They include:

- Alberta Health Services’ 24/7 telephone service, Mental Health Help Line at 877-303-2642
- Families Matter (familiesmatter.ca) is a non-profit organization in Calgary that offers support for families
- Edmonton’s Royal Alexandra Hospital has a reproductive mental health program (780-735-4881)
- For community health services throughout the province, visit albertahealthservices.ca/mentalhealth.asp
- Physicians or midwives can refer mothers to the Women’s Mental Health Clinic at Calgary’s Foothills Hospital (403-944-5872). [@](mailto:info@albertahealthservices.ca)

— Kathryn Ward

A matter of nature and nurture

Development is affected by the interaction of our genes and our environment



Children don't just grow; they develop.

Children develop through different experiences and by changing their behaviours accordingly.

Each child develops in his own time. The developmental process, which involves physical, cognitive, social and emotional development (see Glossary on page 6), is something every child goes through and is affected by any number of factors.

"It is a natural process, and it is a resilient process," says Jane Hewes, Chair of Early Learning and Child Care at Grant MacEwan University in Edmonton. "It also very much is affected and influenced by the environment that the child is in."

Contrary to conventional wisdom, it's not genes or environment, but the interaction of genes and environment, the combination of nature and nurture, that shapes childhood development.

Development begins even before a child is born. After birth, babies are able to recognize faces, copy others, and interact with their environments from the earliest stages of development.

A child's genes determine which traits he is born with, but factors such as relationships with family and friends, family income and experiences determine whether or not some traits will be activated. Experiences operate like a signature on the genes, setting up later behaviour.

As a parent, your relationship with your child is particularly important to your child, especially during the first few years of his life. How parents interact with children plays a role in how children form and maintain relationships, control their emotions, think about the world around them, and grow.

Alberta has a number of innovative programs for children who are at higher-risk of poor development, and the earlier children and families are connected to these programs, the better.


Stress can also affect a child's development, especially when it is toxic

(chronic, prolonged, unbuffered and negative; see story on page 12.)

The first few years are huge milestones in development, but it doesn't stop there. Basic development ends around age five, but children and their brains continue to develop and mature for their entire lifetime.

"By no means is the story all over by age five," says Thomas Boyce, professor of Pediatrics at the University of British Columbia. "There is still a host of developmental neurological events that are happening well into adulthood."

There are many ways that we can help children develop in healthy ways.

Talking with them, supporting them, and giving them a safe and stable environment can all lead to stronger development. 

— Yasmin Jaswal



- Visit myhealth.alberta.ca and search for early childhood development. You'll find dozens of hits
- See the Government of Alberta's facts and tips on early childhood development at alberta.ca/home/906.cfm

The gap between what we know and what we do

In Canada, fewer than five per cent of children at every socio-economic level are born with known limits to their development. By school age, more than 25 per cent of children are behind where they should be in their physical, social, language or cognitive development. In other words almost all children are born with a strong potential to grow, learn and thrive but by school age many, approximately one in five, have lost ground.

When children start school and can't hold a pencil, follow instructions or get along with other children they are said to be "vulnerable." Not surprisingly, children from poor families are more likely to be vulnerable than children from higher income families. What is surprising is that vulnerable children also come from middle and upper income families in large numbers. While the middle class has a smaller percentage of vulnerable children overall, there is a much higher number just because of the size of the middle class in Canada and Alberta.

What this should tell us is that no specific population group can be exclusively targeted for intervention in the early childhood years – either by income, ethnicity, family risk factors or other traditional risk factors. Vulnerability cuts across all groups.



How can communities support healthy early childhood development?

There is no easy or obvious answer to this question. Stable income and secure housing are essential first steps but alone they are not enough to provide the right conditions for healthy development. What we know about the science of early childhood development tells us that young

children, in addition to proper nutrition, opportunities for physical activity, clothing and shelter, also need to be surrounded by quality caregiving, positive "serve and return" experiences and "nontoxic" environments. The community is where most families will look to meet these needs.

— *Let's Talk About the Early Years*



Mental health matters to kids, too

Reducing stigma key to helping children

It's dinnertime and your four-year-old has just dissolved into hysterics after accidentally dropping his fork. Maybe he's tired or maybe he's just having a bad day.

But if a child continually overreacts to minor problems, it might be a sign he's not effectively coping with stress. Over time, poor coping skills can affect a child's ability to learn and interact with others, and even weaken his immune system.

Parents and caregivers are usually well attuned to children's physical and cognitive development, but are often less attuned to children's social and emotional development, says Christine Riddell, an Alberta Health Services social worker who specializes in mental health screening and promotion.

Good mental health can be described as levelness (see Glossary on page 6).

"Giving children the skills to identify and manage their emotions helps to build resilience, and carries over into all aspects of their lives," she says. "Good health isn't possible without good mental health."


Indeed, many mental health problems can begin early in our lives. The Mental Health Commission of Canada says that for more than 70 per cent of adults living with mental health concerns and illnesses, their symptoms began in childhood or early adolescence.

Mental health problems really need to be addressed early, says Nancy Reynolds, the former president and CEO of the Alberta Centre for Child, Family and Community Research, and


a former assistant deputy minister of Partnership and Innovation for Alberta Children's Services.

"Many children need psychological intervention, but only a small percentage actually receives it," she says. Parents face the stigma of having a mentally troubled child and are too often reluctant to reach out for help.

"A lot of good work is being done in the schools in terms of making mental health part of the normal conversation, but schools can't do it alone," Reynolds says, adding that reducing stigma and helping children who need it depend on support from everyone in a community.

Riddell urges parents and caregivers to seek help if they feel they need it, even if it's just for some advice. "Babies don't come with an instruction manual." 

— Greg Harris

 For more information about children's mental health, contact:

- Mental Health Help Line 1-866-408-5465 (toll-free across Alberta)
- Mymentalhealth.ca
- Myhealth.alberta.ca



Photos: Shalton Cunningham, Salt Food Photography

Feed your brain

People often consider how their diets will nourish their bones, teeth, skin or heart, yet rarely consider their brain. But nourishing your brain is central to overall well-being. Omega 3 fatty acids are essential fats that are involved in the brain, eye and nerve development of infants and young children. They're also heart healthy. But our bodies cannot produce them so we must get them from food sources, such as salmon, mackerel, sardines, herring, anchovies and arctic char. Other sources are ground flaxseeds, canola and soybean oil, soy products and walnuts.

Canada's food guide recommends eating at least two servings (2-1/2 ounces or 75 grams) of fish each week, with an emphasis on fattier fish rich in omega 3s and lower in mercury, such as salmon, trout, char and sardines. (If you're concerned about the mercury content of fish—an important

consideration for children and pregnant women—visit Health Canada at hc-sc.gc.ca for detailed information.)

Beyond omega 3s, antioxidants protect against cell damage. Antioxidants are vitamins, minerals and other plant substances that slow down or prevent damage caused by free radicals, something that occurs daily as we are exposed to our environment. Vitamins and minerals with antioxidant properties include vitamin E, vitamin C and beta-carotene, which are readily found in fruits and vegetables.

Here's a meal rich in all of the above—omega 3 fatty acids from salmon, walnuts and flax oil, and a rainbow of antioxidants and other essential nutrients from spinach, peppers, mango and berries.

— Julie Van Rosendaal

1 Spinach salad with strawberries & raspberry-flax vinaigrette

Easy to throw together, this nutrient-dense salad is loaded with antioxidants, and it's not just the spinach and berries: one medium red bell pepper contains 152 mg of vitamin C, more than twice as much as an orange. If you like, swap the strawberries with other in-season berries, such as blackberries or blueberries.

Ingredients

- 1 – 8 oz. (225 g) pkg. washed baby spinach
- 1 small red, yellow or orange bell pepper, seeded and thinly sliced
- 1 cup (250 ml) strawberries, hulled and halved (if small) or sliced
- 1/4 cup (60 ml) thinly sliced purple onion
- 1/4 cup (60 ml) crumbled goat cheese or feta (optional)
- 1/4 cup (60 ml) chopped walnuts, toasted (optional)

Vinaigrette:

- 2 Tbsp. (30 ml) olive oil
- 2 Tbsp. (30 ml) flax oil
- 2 Tbsp. (30 ml) raspberry or red wine vinegar
- 2 tsp. (10 ml) grainy mustard
- 1 tsp. (5 ml) honey

Preparation

Place the baby spinach in a wide bowl, and top with bell pepper strips, strawberries, purple onion and feta and walnuts, if using. In a small bowl or jar, whisk or shake together the canola oil, flax oil, vinegar, mustard and honey; drizzle over the salad and toss until lightly coated, or serve alongside the salad at the table for guests to dress their own.

Serves 6.

The lowdown

Per serving (including dressing but not optional walnuts or cheese): 110 calories, 9 g total fat (1 g saturated fat, 0 g trans fat), 0 mg cholesterol, 55 mg sodium, 6 g carbohydrate, 2 g dietary fibre, 3g sugars, 2 g protein



✦ Our Meal Deal recipes have been analyzed by registered dietitians with AHS Nutrition Services. All recipes meet healthy eating guidelines



2 Roasted salmon with lentils and creamy pesto

If you like, cut a lemon into wedges and place upright (rind-side-down) around the salmon to roast alongside. The cooked wedges will be easier to squeeze over the fish and will release more juice.

Ingredients

Lentils

- 2–1/2 cups (625 ml) No-sodium or sodium-reduced chicken or vegetable stock or water
- 1 cup (250 ml) small green or du Puy lentils, picked over
- 1 small onion, peeled and finely chopped
- 1 celery stalk (with leaves), finely chopped
- 2 garlic cloves, crushed

Salmon

- 1 lb (454 g) salmon or trout fillet
- 4 tsp. (20 ml) olive or canola oil
- 1 Tbsp. (15 ml) red wine vinegar
- 1 tsp. (5 ml) grainy mustard
- Pepper

Pesto

- 2 Tbsp. (30 ml) bottled basil pesto
- 1/4 cup (60 ml) plain low-fat yogurt (1% MF)

Preparation

In a medium saucepan, bring the stock or water to a simmer. Add the lentils, onion, celery and garlic and cook, stirring occasionally, for 40 minutes, or until the lentils are just tender. Remove from heat, drain any excess liquid and toss with 1 Tbsp. olive oil, vinegar and mustard. Season sparingly with pepper. Meanwhile, preheat the oven to 425°F (220°C). Place the salmon, skin side down (if it has skin) on a foil- or parchment-lined rimmed baking sheet. Drizzle with the remaining 1 tsp. oil and rub with your fingers to coat completely. Sprinkle with pepper and roast for 10 minutes per inch (25 mm) of thickness (it should take 8 to 10 minutes), until the edge of the fish

flakes with a fork, but the filet is still slightly soft in the middle. In a small bowl, whisk the pesto and yogurt until well combined. Serve the salmon on a bed of lentils, drizzled with the pesto sauce.

Serves 6.

The lowdown

Per serving: 280 calories, 13 g total fat (2.5 g saturated fat, 0 g trans fat), 60 mg cholesterol, 250 mg sodium, 13 g carbohydrate, 2 g dietary fibre, 4g sugars, 26 g protein

3 Instant berry-mango frozen yogurt

Loaded with antioxidants and fibre and low in calories, berries make an intensely coloured and flavoured frozen yogurt, that's easy to do from scratch without an ice cream machine. Simply start with frozen berries (you can freeze your own), and blend them with juicy mango and plain yogurt in your food processor. Instant dessert!

Ingredients


- 1 mango
- 1 lb. (454 g) frozen mixed berries
- 2 cups (500 ml) plain low-fat yogurt (1% MF)
- 2–4 Tbsp. (30–60 ml) honey, or to taste

Preparation

Slice the cheeks off the mango stone, score the flesh and scoop it out with a spoon, placing it in the bowl of a food processor. Add the berries, yogurt and honey and pulse until well blended, almost smooth and thick, like soft frozen yogurt. Serve immediately (it will be soft), or transfer to a container and freeze for about half an hour, or until it firms up. (Don't leave it in the freezer too long, or it will freeze solid.)

Serves 8.

The lowdown

Per serving: 90 calories, 1 g total fat (0.5 g saturated fat, 0 g trans fat), 5 mg cholesterol, 45 mg sodium, 18 g carbohydrate, 1 g dietary fibre, 15 g sugars, 4 g protein 

Healthy brains begin in the womb

Exposure to different environmental events may affect development in very different ways



The formation of the brain is more than an expression of parents' genes. The emerging brain is also shaped by what a baby experiences before birth.

Dr. Bryan Kolb, a professor in the Department of Neuroscience at the University of Lethbridge, says the development of the prenatal brain reflects a complex interplay of genes and experiences.

"There's no strict genetic blueprint on how to build a brain," says the neuroscientist. "Brains exposed to different environmental events such as sensory stimuli, drugs, diet, hormones or stress may develop in very different ways."

Brain cells, or neurons, begin to form about a month after conception and peak in the fourth month at 250,000 neurons a minute, Kolb says. It takes about 10 billion cells to form one brain hemisphere.

During pregnancy, newly formed cells rapidly sculpt the brain's circuitry in genetically planned stages. Within the first six months of pregnancy, basic sensory and motor regions of the brain begin to function, and by the last trimester an unborn baby is capable of simple forms of learning.


What a baby experiences while connections are forming between different regions of the brain could significantly alter the wiring of cells and overall brain development.

apple
It's well documented that a mother's use of alcohol or nicotine while

pregnant can disrupt brain growth and lead to vision or hearing problems, brain damage, learning disabilities or birth defects.

If a mother is very depressed, her emotional state could have a negative and lasting effect on her child. Street drugs and certain prescription drugs can also affect a fetus, Kolb says.

Creating a responsive maternal environment is one way to influence babies' brain development, says Dr. Robbin Gibb, associate professor in the Department of Neuroscience at the University of Lethbridge and researcher at the Canadian Centre for Behavioural Neuroscience. For example, reading aloud will improve a baby's literacy and make the brain more adaptable and better able to deal with stresses later in life.

"As a parent, you have a profound effect on your baby and you have the power to make the choices that help this baby on the right track," Gibb says. Communities can pitch in too by helping families connect with one another, get some down time and offering parenting resources. 

— Dawna Freeman

Building baby's brain

Dr. Robbin Gibb, an associate professor in the Department of Neuroscience at the University of Lethbridge and researcher at the Canadian Centre for Behavioural Neuroscience, offers these tips for healthy prenatal brain development.

For expectant moms

- Eat well to nourish herself and baby
- Get enough sleep, this helps baby rest too
- Rest, sing or play music to your baby
- Keep stress levels down, moderate exercise such as walking or yoga will help.

For expectant dads

- Create positive bonding experiences by gently massaging and talking to "the bump." Evidence shows a newborn can recognize his dad's voice right after birth if the dad has been talking to his unborn child. And the rubbing of mom's skin will produce a protein that helps to develop the fetal brain.

Full-term pregnancy good for moms and children

Babies born even three and four weeks early may face health concerns

A full-term pregnancy is 40 weeks long. And as long as mother and baby are healthy, the last weeks are just as important as those at the beginning and middle.

"The final phase of prenatal development is a period of rapid growth—in particular, brain maturation and growth," says Sheila McDonald, a researcher at the Child Development

Centre at the Alberta Children's Hospital. As well, the lungs and gastrointestinal system mature at this time.

Many late preterm babies (born at 34 to 36 weeks) are healthy at birth. Some babies, however, have trouble breathing and their development and ability to learn

can be poorer than babies born at 39 weeks and beyond. As well, some late preterm babies find it difficult to suck, swallow or stay awake long enough to feed properly, making breastfeeding harder.

A study by McDonald and five other researchers, *A Comparison between Late Preterm and Term Infants on Breastfeeding and Maternal Health*, also confirmed what several previous studies had suggested: a late preterm birth can increase a mother's risk of depression, anxiety and stress.

In the past 25 years, preterm births have increased by 36 per cent. The changes are linked to several reasons, such as infertility treatments and increases in mothers' ages, multiple births, obesity and decisions to induce labour or deliver by Caesarean section before 39 weeks.

Ideally, pregnancy is at least 39 weeks, giving a baby time to gain weight and physically develop.

A healthy pregnancy relies on making healthy choices throughout its duration.

"Women who choose not to smoke or use alcohol in pregnancy, who gain the recommended amount of weight, as well as women who establish good support networks and healthy relationships are more likely to have healthy babies," says Suzanne Tough, a study co-author, professor in the departments of Pediatrics and Community Health Sciences at the University of Calgary, and Health Scholar for Alberta Innovates—Health Solutions.

— Colleen Seto



For more information, see **Quick Tips: Healthy Pregnancy Habits** at myhealth.alberta.ca or call **Health Link Alberta** at 1-866-408-5465 (LINK) for the prenatal support program or service nearest you



Photo: Image Source Photography/Veer



Your brain's air traffic control system

Executive function lets you remember, focus, plan and respond

In any classroom you'll find some students quietly working while others are doing everything but—daydreaming, fidgeting, texting, tossing erasers and barbs. What keeps on-task students focused despite all those distractions, yet able to switch gears if needed?

A learned ability called executive function. Just as air traffic controllers

enable many planes to use an airport without colliding, so executive function equips us with the ability to remember, focus, plan and respond appropriately to diverse circumstances.

"It's foundational to learning," says Mount Royal Child and Youth Studies professor Dawne Clark. "It's not the content, but the processes that allow us to learn."

While we develop our executive function into our 20s, an explosion of research is reinforcing the importance of nurturing this ability from a child's very earliest days.

"We now know that babies are born with hundreds of thousands of neural pathways, and that the pathways they use are the ones they will take into adulthood," says Dianne Cully, a program manager in Child and Adolescent Addictions and Mental Health for Alberta Health Services. "We need to help children develop the pathways that will be most useful to them as adults."

Reinforcing useful pathways takes time and return interactions: positive experiences and strong relationships with stable, caring adults, Clark says.

Children need calm, predictable environments to build working memory, which is the ability to hold and manipulate information in our heads. To develop cognitive flexibility or the ability to multi-task and apply different rules in different settings, they need to practise increasingly complex situations with adult support. To learn behavioural inhibition or the ability to think before acting, children need engaged adults who have the time and skills to listen and help them express emotions in socially acceptable ways rather than neglecting, over-reacting or bottling up their feelings.

Cully urges parents and other caregivers concerned about a child's executive function to contact a doctor, public health nurse, mental health service or Health Link Alberta at 1-866-408-LINK (5465). AHS offers numerous supports for families and caregivers.

"We can often help children recover some lost executive functioning, but it's so much more effective to promote healthy social-emotional development in the first five years." [@](#)

— Cheryl Mahaffy

* For more about executive function, visit: albertafamilywellness.org



Photo: Ewan Nicholson

You: the ultimate toy

Balls are a blast, Lego is lovely and screens seem to be everywhere. But no toy, game, or virtual pastime is more fascinating and beneficial to a child than playing and interacting with parents and caregivers.

Play often includes serve and return exchanges (See *Serve and Return* on page 11), which are key to brain development. Jane Hewes likens serve and return exchanges to a game of tennis or volleyball. The child begins with a gesture or sound—the “serve”—and the parent responds with the “return.”

“Infants invite us into a play relationship that is incredibly

rewarding,” Hewes, the Early Learning and Child Care Chair at Grant MacEwan University in Edmonton, says. She adds that many parents and caregivers make games as simple as blowing raspberries with children, or playing Peek-a-Boo as part of their everyday routines.

“Make sure your play has no goals,” says Hewes. What you play and what you play with are secondary to just being together. These serve and return exchanges are also fun and shape a child’s future mental and physical health. They can’t be replicated on a screen.

North American pediatricians agree


that watching television has little value for children younger than two years old and that television is not a replacement for serve and return interactions.

“Interacting with people promotes social development,” says David Bickham, staff scientist at the Center on Media and Child Health at Boston Children’s Hospital and a pediatrics instructor at Harvard Medical School.


“TV doesn’t respond to the child. It’s not like a parent making noise and facial expressions that the child can mirror back. The child can see that’s how a face works and this kind of social play becomes part of the development of being skilled at social interactions.”

Toys and equipment also have a place, and Bickham says the best ones are those that let you and your child make up stories as you play together. Toys from popular television shows or movies already have a storyline and that thwarts the creative potential of play.

Dinnertime is also a time to be together.

“If you are cooking dinner, the child can sit in a supported chair, watching,” he says. “That way you and the child can engage with each other.” 

— Anne Georg

 For more about playing with infants, babies, toddlers, preschoolers and new schoolers, visit myhealth.alberta.ca

the **PARENT** **CHILD** bond



Healthy brains thrive on healthy relationships. For children, a stable, nurturing relationship with their parents and other caregivers is central, Lisa Monforton reports

Photos by Trudie Lee Photography Inc., courtesy of Alberta Family Wellness Initiative

The foundations of a healthy brain begin early in life and depend on stimulating experiences and positive, supportive relationships between children and their caregivers. More than anyone else in a child's life, parents have the ability to build and strengthen these foundations. But they can't do it alone.

As humans, we are wired to become parents: to produce, nurture, teach, protect and bond with our offspring. But our ability to parent varies widely by our relationships, neighbourhoods, resources and cultures as well as our values and own experiences.

"All humans have the same circuitry to become parents," says Dr. Linda Mayes, a researcher of the Yale Child Study



Center and its Edward Zigler Center in Child Development and Social Policy.

Our brains contain “reward circuitry,” adds Mayes, who studies how the brain’s reward, pleasure-seeking and stress regulation functions. The reward circuitry is central to caring for another person and is in the same area of the brain drug addiction and habit-forming rituals stem from.

This part of the brain “becomes highly specialized and sensitized to the cues that come from the baby, or whoever is on the other end of the care equation,” Mayes says. For example, new parents have reported they can hear the slightest noises, a reflection of their new protective role.

A newborn’s brain also transforms but at an explosive rate. About 700 neural connections a second are formed as a result of our genes, environment and experience.

Neural connections and early, healthy bonding both depend on “serve and return” interactions (see story on page 6), a building block for long-term emotional, social, cognitive and physical health. This is how early experiences are literally built into the brain.

Such interactions, called contingent reciprocity by developmental researchers, also form the foundation for lifelong healthy brain architecture. The more these circuits are exercised, the stronger they become, scientists have found, emphasizing the need for meaningful bonding early on.

“Neural systems are particularly plastic in the first five years of a life... but we are now learning that there is tremendous capacity for change all through life. The brain is a very plastic, changeable organ.”

As powerful as the parent/child bond is, it can still be undermined.

Toxic stress and adverse childhood experiences (ACEs) (see stories on pages 7 and 31) can delay and derail child development.

Post-partum depression (PPD) can also seriously erode the parent/child bond.

PPD — sometimes called “the thief that steals motherhood”— is debilitating not just for moms, but also for dads and other siblings and family members. And it can have long-term negative effects.

Dr. Nicole Letourneau, a professor in the University of Calgary’s Faculty of Nursing and the Norlien/Alberta Children’s Hospital Chair in Parent-infant Mental Health, says 15 per cent of women are prone to PPD, and it’s unclear why some women slip into a deeper and longer depression.

While PPD is commonly thought to be linked to a hormone, Letourneau says one has yet to be identified. Indeed, hormonal upheaval is a natural part of the post-natal weeks, with 50 to 80 per cent of women getting the “baby blues,” typically caused by fatigue and hormonal changes.

Serve-and-return interactions are a building block for long-term emotional, social, cognitive and physical health



In her paper *Postpartum Depression is a Family Affair: Addressing the Impact on Mothers, Fathers and Children*, Letourneau notes one common denominator with PPD is that women who experience such symptoms have too much stress and not enough support.

“Even women who are prone to depression, but have support, do not go on to develop PPD,” says Letourneau.

Parental support, self-care and healthy communities are essential to overcoming adversity and cementing the parent/child bond. For example when communities and governments offer family-oriented parks, recreation facilities and programs, flexible paternity leave time and quality childcare services, they’re also supporting healthy brain architecture.

“If you are chronically stressed or overworked, you can’t be available

to yourself and surely you cannot be available to your child,” Mayes says. How parents experience the world directly affects how their children experience the world.

Mayes and Letourneau encourage parents to build personal social support networks and also tap into health-care networks and practitioners.

Letourneau says the biggest challenge to parent/child relationships is the lack of support from society. “We’re not as family-centric of a society as we could be. New parenthood is wonderful, but it’s very hard.”

It’s typical for both parents to be working outside the home, she notes, and that can be a challenge, never mind the added anxieties that can upset the balance of a parent/child relationship.

15 ways to a stronger bond with your child

1. Make memories by eating and talking together
2. When your child needs you, respond quickly and sensitively
3. Think about an activity that was special to you as a child and repeat it with your family... or start a new tradition
4. Provide routines for your child, but leave room for the unexpected
5. Read, talk and listen
6. Let your child try something new
7. Realize that what you can expect of your child will change as he grows and learns
8. Seek parenting information from people and sources you respect, and then trust your judgment
9. Forget perfection — aim for your best
10. Go “Old School”— put away all electronic gadgets for a day and see what happens
11. Get enough sleep — it will mean happier days for you and your child
12. Teach your child the words for feelings (sad, happy, mad)
13. Take your child to the grocery store and choose a new fruit or vegetable to try
14. Find a cardboard box to play in. Be amazed by your child’s imagination
15. Show your child you care by:
 - Giving hugs
 - Playing on the floor together
 - Saying “I love you”

SOURCE: Foothills Children’s Wellness Network (foothillsnetwork.ca)



“In my opinion there isn’t enough of a circle. Society needs to provide a protective barrier around new families... for the parent/child relationship to thrive.”

And while we know more about that relationship than ever, Mayes says more research and social program development is needed. “When you look at services for adults and children, especially in the mental health world, those services seem to be separate.”

Both Mayes and Letourneau say a more holistic approach is needed for families in need.

Letourneau, previously based in New Brunswick, says she came to Alberta because she believes it is leading the way in such an approach.

“(Alberta is) trying to enact social change in supporting families,” she says, giving Alberta Health Services’ Head Start program, as an example. “People all over the globe are looking at Alberta.”

How parents experience the world directly affects how their children experience the world.

Meanwhile, parents around the globe are learning that technology and social media are the newest influences on the parent/child bond.

Parents’ authority and influence has been usurped by modern technology, which fosters superficial relationships and a culture of peer orientation, says developmental psychologist Dr. Gordon Neufeld, who, along with Gabor Mate, is the author of the popular and internationally acclaimed

book *Hold On To Your Kids: Why Parents Matter More Than Ever*.

He maintains friends have become more important than parents.

Typically manifesting itself in the early teen years, it can happen as young as kindergarten. This happens, he asserts, because at some point many parents give up control and lose their way. “Adolescents need to be very well attached to the adults in their lives for them to become truly their own persons.”

Two simple things need to be in place to achieve that goal and for the parent/child bond to remain strong at all times.

“The role of a parent is to give more (to a child) than what is pursued: children must never work for our love,” Neufeld says. [@](#)

* For more on the science of early childhood, visit: developingchild.harvard.edu

Time: the best investment in your children

Minutes, hours and days add up to a powerful factor in raising kids

Time with our kids is not a passé notion in the 21st century. In fact, research shows it might be one of the most powerful factors in creating socially and emotionally healthy adults.

When you spend time with your children they learn they matter, and it builds their trust in you, says Tanice Jones, coordinator of the Parent Link Centre in Grande Prairie. Jones calls time a “protective factor” against detachment problems and anti-social behaviours as a child grows.

First results from the Early Child Development Mapping Project Alberta, a peek into how ready our children are for school, are cause for concern, says Jones. “Our kids are doing poorly socially and emotionally.” The “why” is still being examined, but Jones thinks it is likely to include overwhelmed

and overscheduled lives, too much computer and toy time and not enough one-on-one time between parents and children.

“It’s about balance,” Jones says. “Don’t feel pressure about (creating) ‘teachable’ moments. Take the moment; it will be teachable.” When your child needs you, press the pause button and pay attention.

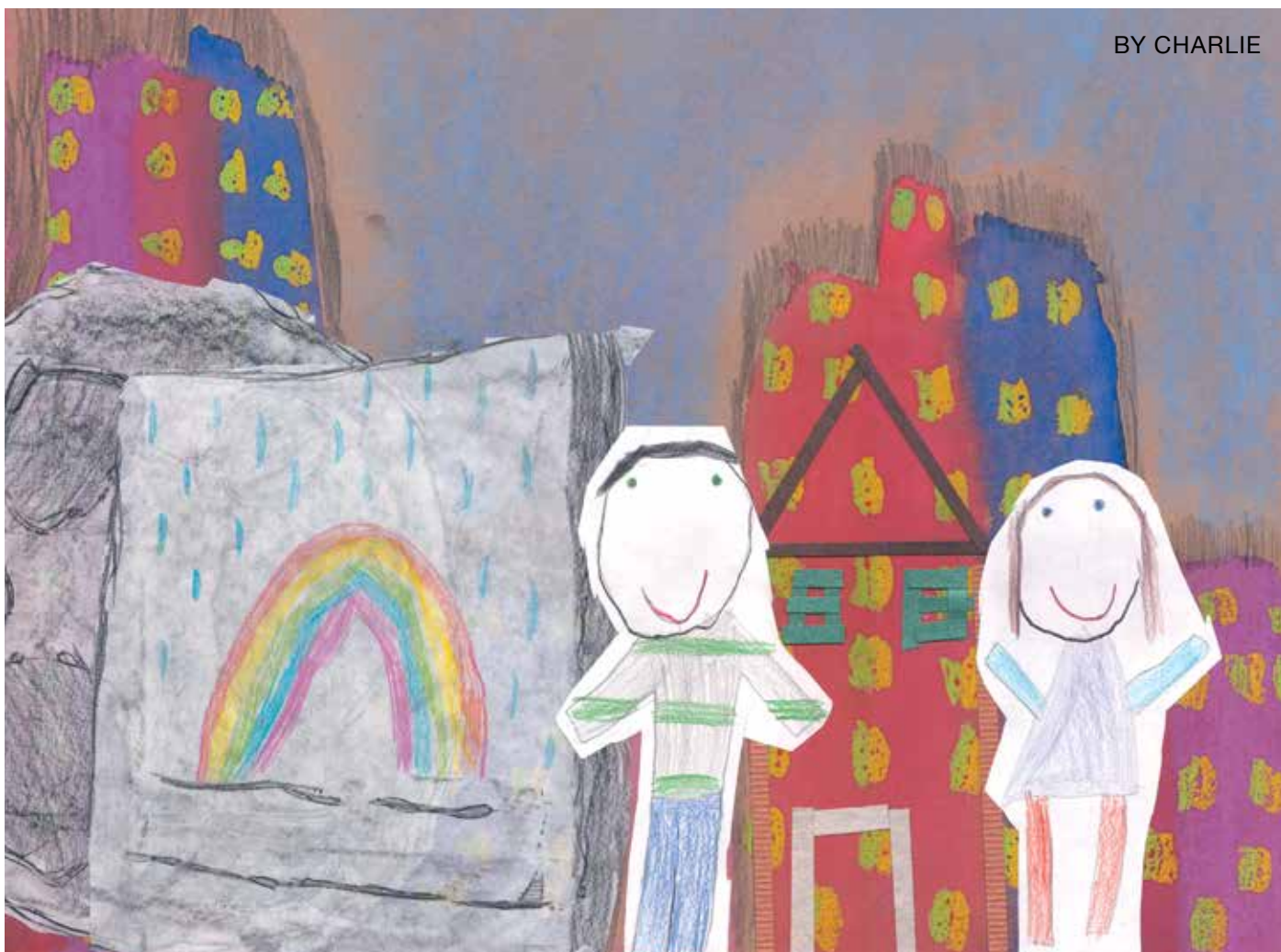
Patrick Dillon, provincial coordinator for the Alberta Father Involvement Initiative (abdads.ca), admits it is a challenge for parents to find time because in many families both parents work. But kids are looking for a sense of belonging and if they don’t find it with family, they may find it elsewhere. When parents are involved with their children, children and youth are less likely to be involved in gangs or unhealthy relationships.

To find more time with your kids, you can:

- Separate work time from family time
- Learn to say “no” to work, volunteering and activities that take you away from your family
- Find things you can do with your kids such as walking, hiking, camping, swimming, reading, playing or listening to music, skating and family games night
- Try to arrange flexible work hours; let your employer and co-workers know you value time with your children. [@](#)

— Colleen Biondi

* For more information on the value of time with your children, visit: healthyparentshealthychildren.ca, abdads.ca or MyHealth.Alberta.ca



the power of **dads**

For all kinds of reasons, many fathers are often at a loss on how to fit into their children's lives. But overcoming the struggle and occasional awkwardness of paternal parenting is well worth it. As Lucas Warren writes, involved fathers have a powerful influence: they're strongly connected to their children's healthy development and they also benefit mothers, employers and society as a whole

Illustrations by the young artists of the summer drawing/painting program at the Wildwood Arts Centre in Calgary

Some days, my son looks at me like I'm from another planet.

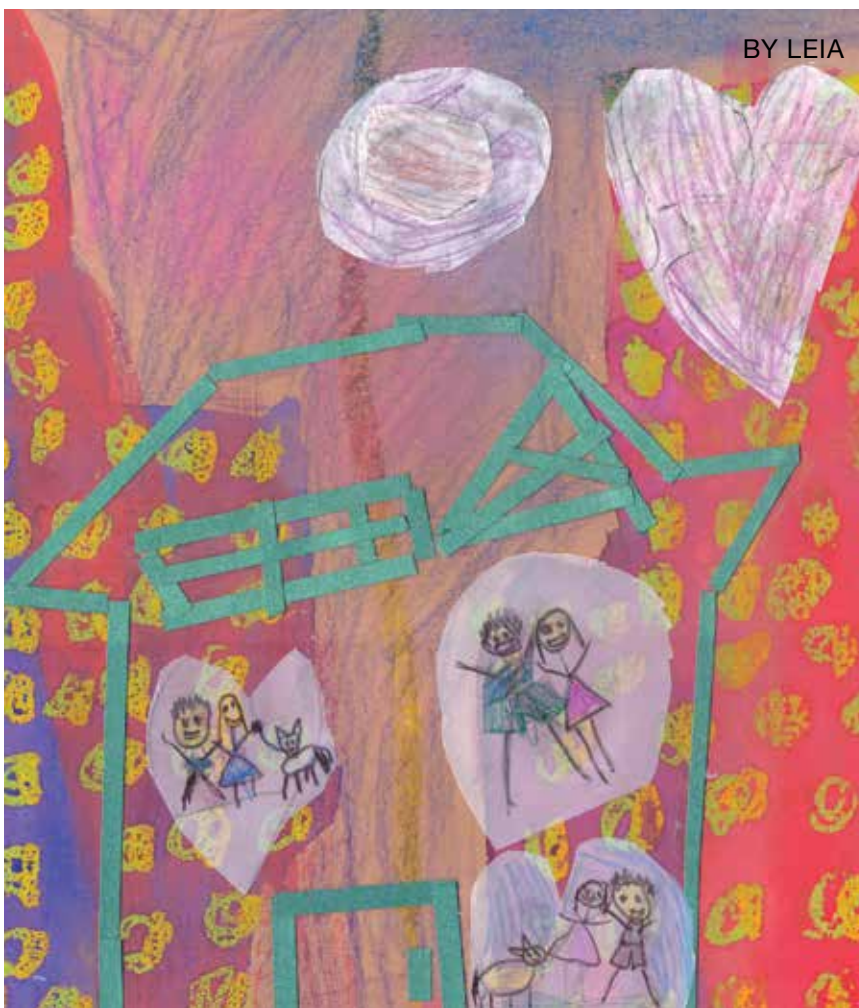
With a limited knowledge of Pokemon and almost everything else he likes and I've never heard of, I often have a hard time proving him wrong. Thinking about it, I wonder about what I'm doing as a father. My solution: persistence, patience, a sense of humour and a lot of weird Google searches.

I'm not alone. Like me, lots of dads (not to mention grandfathers, uncles and other male caregivers) struggle to find their place in their children's lives right from the beginning. A lack of basic equipment relegates us to playing supporting roles through pregnancy and infancy. For many of us, trying to find the right place in our children's lives is a never ending task. It also hasn't helped that a lot of the community help for families has leaned towards moms and "their" kids. Even when we think we've figured out our role, along comes another grade, game or social network to decipher.

Despite these and other serious barriers that keep fathers from being involved with their children, growing evidence shows that not only do the children of involved fathers benefit, but so do mothers, employers and society as a whole (not to mention fathers themselves).

The benefits of being involved

Doctors Marsha Kline Pruett and Kyle D. Pruett have been studying paternal engagement in families with young children. Marsha is the Maconda Brown O'Connor Chair in Research at the Smith School of Social Work and a clinical/community psychologist and Kyle is a clinical professor of child psychiatry and nursing at the Yale School of Medicine's Child Study Center; both are faculty members of the Alberta Family Wellness Initiative (AFWI). Their research is part of the larger Supporting Father Involvement (SFI) Program, an American clinical and research program that supports family-related agencies in becoming more father-friendly.



The study of more than 900 families compared different types of father involvement and its effects on families and children. The well-being of the parents, the quality of the relationship between the parents and in the family, parenting styles, and outside stresses and social supports were all examined in the study.

SFI research confirms what a growing number of other studies have found in the past 20 years: involved fathers have a strong link to their children's healthy development.

The Pruett's' work shows that the children of involved fathers tend to be

more social and positive as infants, with a greater capacity for empathy and fewer overall behavioural problems during childhood. As these children get older, they also have better problem-solving skills, achieve more in school, engage later in sex, adapt better to stress and have more satisfying adult relationships.

Research into positive father involvement has also shown it can protect children against delayed development, smoking, criminality, promiscuity and depression, and can reduce children's risk of developing an addiction later in life.

Beyond benefiting children, SFI

The way dads interact with children is different and different parts of children's brains develop as a result of how they interact with their dads

BY MEGAN



Male caregivers are encouraged to be responsibly involved with and, in turn, have a positive influence on the children in their lives

research also revealed that men who are involved fathers tend to live longer and healthier lives, are happier and more successful with their work, and have more satisfying adult romantic relationships. Their partners experience lower stress and depression levels, are more responsive to their children, and are less likely to leave the workforce.

SFI in Alberta

Recognizing the long-term potential and benefits of the SFI Program's research, the AFWI is supporting four similar pilot programs in the province. Taught to program leaders by the Pruetts, the

programs are offered to both couples and fathers. (See sidebar Supporting Father Involvement on page 42.)

Cheryl Skaien works at the Family Centre of Southern Alberta and oversees the 11-week-long regional SFI program in Lethbridge, which highlights the importance of fathers' involvement in their children's lives.

"Because our society has always valued the mother, if mothers 'gate keep' (control most parenting decisions) because of the perception that everything dads do is 'wrong,' children can perceive dads as devalued," Skaien explains. "(With involved fathers) children get the best of both worlds. The way dads

interact with children is different and different parts of their brain develop as a result of how they interact with their dads."

She explains that when moms hold their babies, traditionally they hold them protectively in their arms, whereas dads will often hold babies on their knees, facing them out to the world. Such simple differences, even when they don't follow traditional gender stereotypes, are central to how a child processes and experiences the world. As SFI work is demonstrating, it is an advantage for a child to be given a caring, nurturing environment by one caregiver and encouraged to take chances and experience by another.

There's a dad for that

Still, some fathers hold back from spending quality time with their children. The reasons behind their reluctance range from cultural (my dad never played with me), to societal (mothers who gate keep) to institutional (governments that are only concerned with the financial involvement of fathers). Another much simpler reason is that, a lot of the time, we guys just don't know what to do.

"We've had a couple of people comment that 'wow, that's all it takes,'" says Patrick Dillion with the Alberta Father Involvement Initiative (AFII), an organization dedicated to promoting the bond between dads and their children.

To bring home this message, the AFII has released a number of short videos and other interactive resources under the banner of their new slogan: There's a dad for that. The suggestions are deceptively simple — bike riding, helping with homework or a hug — but show fathers that their involvement does not have to be complicated or require large amounts of time to be worthwhile.

"It's the simplicity of being involved with kids," Dillion explains. "You come home at the end of the day, you're tired. Rather than sitting down and feeling sorry for yourself, what's wrong with sitting down with your kid and helping them with their homework? Or fixing their bike?"

Since 2009, the AFII has offered information for fathers, individuals, agencies and programs working with fathers. The initiative encourages male caregivers to be responsibly involved with (and, in turn, have a positive influence on) the children in their lives. That the AFII was originally funded by a private corporation, Encana, shows more than mothers and health professionals see the benefits of father involvement.

“Encana felt that it was important to address father involvement because a majority of their employees were men, a majority of the men were dads, a majority of the dads worked away from home,” Dillion says. “They felt it was important to have something that promoted responsible fatherhood.”

More employers — from oil and gas to the Canadian military— are recognizing their employees are happier and more fulfilled when given the opportunity to interact more with their children.

How to become involved

Being involved in a child’s life is as simple as being involved.

You can read your child a story at night or help make breakfast in the morning. You watch the ballet lessons and you juggle your schedule to go to the parent/teacher interview. You share



laughs, sit down for dinner and go for walks together. These experiences are serve and return interactions (see page 13).

For me, fatherhood is sometimes a little daunting — isn’t every parent in awe of parenting once in a while? But I am increasingly conscious that the opportunities to connect with my son before he grows up are fleeting. I know every effort I make to be involved is worth it, not just for my son or his mother, but for me. Being involved makes me actually enjoy being a dad, even if my son sometimes thinks I’m from another planet. [@](#)

Supporting father involvement

The Alberta Family Wellness Initiative (AFWI) offers the Supporting Father Involvement (SFI) program at four locations, and through four different community groups in Alberta. Designed for families of all backgrounds and based on research, the pilot programs encourage fathers to become or stay positively involved with their young children.

To learn more, contact the SFI program nearest you:

- Family Centre Society of Southern Alberta (Lethbridge) at 403-320-4232 or info@famcentre.ca
- Norwood Child and Family Resource Centre (Edmonton) at 780-471-3737
- Western Rocky View Parent Link Centre (Cochrane) at 403-851-2250 or fcss@cochrane.ca.

—Terry Bullick



Defining the involved father

“You can’t paint a picture of what an involved father looks like,” says Stewart Adams, a group leader of the Father Involvement Program offered in Red Deer by Family Services

of Central Alberta. Playing together, reading, sharing family dinners and countless other activities from planting a garden to riding bikes will benefit children, “if it’s aimed at helping them be a better person. That’s going to look different from one relationship to the next.”

Adams says parents will know when they’re involved and when they’re not.

For research purposes, Dr. Marsha Kline Pruett, the Maconda Brown O’Connor Chair in Research at the Smith School of Social Work, a clinical/community psychologist and a faculty member of the Alberta Family Wellness Initiative, defines an involved father (or male caregiver) who, in his relationship with children, is:

- Responsible for and responsibly behaved
- Emotionally engaged
- Physically accessible
- Materially supportive
- Involved in child care
- Influential in child-rearing decisions.

—Lucas Warren



When growing up is hard to do

Childhood. We think of it as a time of innocence, happiness and wonder. But for some children, fear, neglect and abuse are a significant and lasting part of growing up. Edmonton writer [Cynthia Dusseault](#) looks at how adverse childhood experiences can affect relationships and health for a lifetime



As an adolescent, Gereen Anderson endured emotional abuse that prevented her from developing a sense of identity. From the age of 12, until she was 20, Anderson lived with her mother, who was addicted to prescription drugs, was manic depressive and an anorexic, agoraphobic and kleptomaniac. “I lived for my mother,” says Anderson. “I had no friends. I didn’t go to my graduation. I didn’t do anything that wasn’t about her or for her. She would even force me to steal for her.”

For eight years, Anderson’s life was one adverse childhood experience (ACE) after the next. It took years of time and a network of supportive relationships for her to find stability in her life.

Mariette Chartier, a research scientist at the Manitoba Centre for Health Policy, and an assistant professor in the Faculty of Medicine at the University of Manitoba.

as abuse or neglect continues over a period of time, the body is in continual stress-response mode and has prolonged exposure to stress hormones such as cortisol. This type of stress is known as

Children who’ve experienced ACEs tend to ha

ACEs fall into three categories:

- Abuse, which can be emotional, physical, or sexual
- Neglect, which can be emotional or physical
- Household dysfunction, which includes situations such as poverty, parental mental illness, parental substance abuse, marital conflict and domestic violence.

ACEs generally don’t, however, happen in isolation. “Parents’ addictions often go along with the neglect of children, and poverty is a factor that underlies many other ACEs,” explains

Without the support of family, friends, community or society as a whole, children who live through ACEs have a higher risk, in adolescence, of attempted suicide, early sexual activity, drug use and unwanted pregnancy. Throughout life, they’re more prone to develop mental health issues such as post-traumatic stress disorder (PTSD), depression and addictions. They’re also more likely to enter into abusive-partner relationships and to subject their own children to ACEs.

The Centers for Disease Control’s *The Effects of Childhood Stress on Health Across the Lifespan* says that when an ACE such

toxic stress (see *When Good Stress Goes Bad* on page 14) and can damage brain architecture, limit brain growth, hinder memory and spatial navigation skills and lower immunity to infection.

“When the brain is always in this self-preservation mode, it doesn’t develop well in other areas, such as language and social-emotional skills,” Chartier explains, “so children who’ve experienced ACEs tend to have more behavioural and academic problems.”

ACEs can affect a child’s “levelness.” Levelness is what makes a table usable and functional, just like a child’s mental health makes her able to function in



society. Some children's brains develop on level floors, meaning they'd had healthy, supportive relationships, and good nutrition and health care. For other children, their brains develop on more sloped floors, meaning they've been exposed to abuse and violence, have had unreliable or unsupportive relationships, and lacked access to key programs and resources. Like a table, a child can't make herself level—they need help. As well, the field of epigenetics indicates that genetic makeup and environment work together

fragmented sense of self or intense self-hatred. Either way, it creates a barrier to emotional healing, and even to seeking medical help for physical ailments, because the individual feels unworthy of treatment or therapy, Lanius explains.

Returning to levelness often requires attention from mental health professionals.

Lanius encourages a staged treatment approach to help individuals develop self-identity. In stage one, individuals learn how to feel safe, in control and trust others. In the second stage, they

what she calls "a spiritual journey to find my place." She attributes where she is today—recently graduated from the Correctional Services program at MacEwan University, and now working with offenders — to a series of healthy relationships that eventually led her to life skills coaching. She acknowledges that her journey isn't over. "You're always processing your past," she says.

Processing the past is something sisters Virginia and Rusti Leahy also used to overcome the effects of their ACEs.

ve more behavioural and academic problems

in determining how an individual develops. Contrary to what many think, our genes are not set in stone. "Some kids seem to be very resilient to ACEs, so something in their genetic makeup seems to be a protective factor," says Chartier. But communities that foster a child's levelness — through healthy environments and parent supports — also contribute to resilience.

"I think that one of the core symptoms of early life trauma is a problem with the sense of self," says Ruth Lanius, professor of psychiatry at Western University in London, Ontario. One of the problems is the ACEs can result in a

process dramatic memories and grieve losses related to their ACEs. In the final stage, they reconnect with the world, people, their jobs... with the goal of building new lives for themselves.

Achieving levelness

Gereen Anderson was able to rebuild her life, but it took time.

At the age of 20, when her mother died, she felt lost without the woman who had essentially been her life. She entered into an emotionally unstable 12-year relationship with a woman much like her mother. But she also started

Both were sexually abused through childhood and adolescence, by male relatives, and Virginia also by a school principal. Virginia says journaling and genograms (family trees with health information) were the therapies that helped her the most. Health practitioners use genograms to assess risk factors, and Virginia, now a life skills coach who in fact coached Anderson, uses genograms extensively in her practice.

Of journaling, she says, "The pen is mightier than the analyst; you'll discover things in your writing that you won't discover any other way."



Her sister Rusti found counselling very beneficial. At the age of 22, just after the birth of her son, and while in a verbally and emotionally abusive relationship with her son's father, Rusti sought counselling at the Sexual Assault Centre of Edmonton (SACE). "SACE tells you secrets are the most dangerous things," she says. Now in her early 50s, Rusti has no difficulty talking openly about her experiences. She understands how the sexual abuse affected her ability to maintain healthy long-term relationships. And she understands the anger she harboured towards her mother — the person she felt should have protected her. "There are victims and there are survivors. I would classify myself as a survivor now," she says with a smile.

Prevention and early intervention

Healing can and does happen, even in adulthood. But, by focusing on prevention and early intervention, people such as Anderson and the Leahy sisters wouldn't have to spend years healing from what shouldn't have happened at all. Prevention and early intervention avoid more health care costs later.

Prevention and intervention are the focus of the Collaborative Mental Health Care (CMHC) team in the Calgary Zone of Alberta Health Services. The team connects parents who are struggling with mental health issues with support services, and it works with others close

to a family—grandparents, childcare workers, pre-school teachers—to help them protect and support at-risk children.

"The best opportunity we have to make a difference and promote good mental and physical health outcomes is at the time of early brain development — by intervening when children are young," program manager Dianne Cully says.

Childhood and adolescence already come with their share of ups and downs. Throw ACEs into the mix, and the downs can soon outweigh the ups, making levelness impossible for these children and undermining their ability to function. But help is available, prevention and early intervention programs are making a difference, giving children a stable base from which to heal. [a](#)

Insight on ACEs

- In the first two years of life, children's brains form 700 new neural connections per second. If children face adverse childhood experiences (ACEs) during this time, crucial neural connections can be interrupted or shut down, weakening brain architecture

- The Center for the Developing Child at Harvard University says the more adversity children experience, especially in the first three years of life, the more likely they are to have delays in cognitive, language or emotional development
- Listen to CBC Radio's Ideas program on ACEs, called All in the Family, posted at cbc.ca/ideas/episodes

- If someone you know is dealing with ACEs, Collaborative Mental Health Care program manager Dianne Cully recommends talking to your health-care professional or calling Health Link at 1-866-408-LINK (5465).

— Yasmin Jaswal

31 ways to raise healthier children

As parents, individuals, communities and organizations, we all have the ability to help children thrive: to support their development and brain architecture. Here are 31 of the thousands of ways, as suggested by the following people, who work closely with families and community groups in central Alberta:

- Lori Jack, a community impact development officer with United Way Central Alberta
- Shelley Dallas-Smith, who works in Health Promotion in Red Deer with Alberta Health Services' Central Zone and is the chair of Child and Youth Friendly Red Deer
- Shelley Cooper, a public health dietitian with AHS's Central Zone
- Colleen Milne, a safe communities coordinator
- Dennis Eisenbarth, a case manager with the Father Involvement Program at Family Services of Central Alberta.



Ways parents and caregivers can support children



Ways communities can support children

Moms and dads: be active in all aspects of parenting

Accept peoples' differences

Embrace your spiritual beliefs



Collaborate, collaborate, collaborate

Make family programs and support more accessible

Look after yourself... it's key to looking after others

■ ■ ■ Ways parents and caregivers can support children

■ ■ ■ Ways communities can support children

Be a positive role model

Create vibrant communities... offer living wages

Be a mentor

Promote and support active living

Give children lots of affection

Understand and reduce the root causes of poverty

Cook, eat and spend time together



Support mentorship and learning

Connect with nature

Embrace active living... take 10,000 steps a day

Increase outdoor time/ reduce screen time

Be part of your community... get to know your neighbours

Build walkable communities

Give children opportunities to learn

Practise positive discipline

Read to and with the kids in your life

Set limits and expectations for your family

Help families build coping skills

Make communities socially inclusive

Increase literacy: strive for 100% high school graduation

Nurture volunteerism

Balance work and play

and interesting

Make your home safe, welcoming

Introduce nutrition policies

Remove the stigma of families seeking help





your ever- changing brain

New research is showing that the brain's ability to rebuild itself extends far beyond the first two decades of life, and that it may happen in a surprising way. Edmonton writer **Deborah Lawson** looks at brain plasticity

ILLUSTRATION BY CINDY REVELL

our brains are constantly adapting,

and in fact, can even repair themselves. For example, our brain architecture can be rebuilt when breaking an addiction or following a stroke.

This ability to change is possible because of brain plasticity or “neuroplasticity,” from “neuro,” our neurons (or nerve cells), and “plastic,” meaning “pliant, supple, modifiable.”

“Brain plasticity” is the brain’s capacity to change as a result of input from the environment. Brain circuits are built in a bottom-up sequence during development. As a general rule, the brain is most plastic during the early period of development, meaning that during this time it is the most vulnerable to harm and the most capable of recovery. As brain circuits stabilize, they become more difficult — but not always impossible — to alter.

The architecture of a healthy human brain begins to be laid before birth. The basic architecture of the brain is like the construction of a home — building begins with laying the foundation, framing the rooms and wiring the electrical system in an orderly way. Our early experiences literally shape how our brains get built. A strong foundation in the early years increases the chances of a healthy life. A weak foundation increases the risk of problems later in life.

From birth through the first few years of life, the brain develops rapidly. It influences all that we are and become, and is fundamentally responsible for how we think and feel about life and how we interpret our experiences.

The stability of brain architecture throughout life depends on the quality of the foundation. Positive early experiences build pathways in the brain

that help a child deal with stressful situations resiliently, and create a strong base for later development.

Dr. Bryan Kolb, a neuroscientist and professor in the Department of Neuroscience at the University of Lethbridge, says the most critical period for brain formation is between

the second trimester of pregnancy and approximately four years of age. This is when the brain creates the links that form our abilities to think, move and experience things with our physical senses. These changes continue at a reduced pace through childhood and adolescence, with brain maturity typically reached by about the age of 25.

New research, however, is showing that the brain’s ability to “rewire” itself extends far beyond the first two decades of life, and that it may happen in a surprising way.

the power of thought

Scientists have found that our own thoughts and activities are crucial elements in brain restructuring and repair.

“The discovery that our thoughts can change the structure and function of our brain — even into old age — is the most important breakthrough in neuroscience in four centuries,” says Dr. Norman Doidge, a professor with the University of Toronto’s Department of Psychiatry and author of *The Brain That Changes Itself*.

To learn something new is to change our brain architecture. We do this by repeatedly using particular portions of our brains in a new way. The more we repeat the process, the more likely it is that new brain pathways will develop. As Doidge says, “Neurons that fire together, wire together.”

Researchers have determined that thoughts actually change the physical



state of our brains at a microscopic level. When we “imagine” doing an action, our brains operate in the same way as they do when we actually perform the action. (Athletes regularly use visualization to achieve their desired results.)

Dr. Pat Levitt, at the University of Southern California’s Keck School of Medicine, has been working with the Alberta Family Wellness Initiative (AFWI) and NeuroDevNet, a cross-country biomedical research initiative.

In the past 10 years, says Levitt, researchers have confirmed that brain architecture is influenced by a combination of our genes and our life experiences.

“In terms of timing, ‘early’ matters,” Levitt says. “When things go wrong with brain development early in life, the possible physical and mental health complications can exert an enormous impact on adult health.” Like the foundations of a house, later rebuilding of the brain depends on the soundness of the original structure.

He adds, “The effort required to intervene in sensitive periods (such as early childhood) can be minimal. These are prime times to receive experiences that help the brain develop properly, and if problems arise, it’s easiest to intervene then.”

Language development, for example, is powerfully influenced when parents and other caregivers expose an infant to complex vocabulary in the first 12 to 18 months of life. This personal interaction shapes the child’s environment and changes the brain, leading to the dramatic advance in language development that we usually see in the first couple of years of life. If a child older than age two needs help with language development, the process is more complicated. Intervention is still possible, but it requires more energy, often including direct, individually targeted efforts.

For some children, their homes are filled with language and conversations. But for children whose parents are working three jobs for example, or who may be less verbal or depressed, language may be in short supply.

revolutionary

Addiction, a disease that originates in our reward and motivational systems, changes the brain’s reward pathways. The metaphor of brain faultlines is used

to describe new knowledge about how addictions form (see Glossary on page 6). If faultlines are set off, addictive substances or behaviours come to be seen as a part of the brain’s normal operation. Our understanding of addiction’s relationship to brain plasticity is still in the early stages, although researchers are learning that treatment may be able (at least in part) to counteract the brain’s adaptation to an addiction, through the development of new pathways and reward systems.

Our increased understanding of the brain is shedding light on why, as a society, it’s important to prevent children’s exposure to damaging conditions that can erode their early brain architecture.

These conditions can range from disruptions in family stability to adverse childhood experiences. Our increased understanding of the brain also allows us to more effectively treat a wide range of other ailments such as stroke, brain cancer, radiation damage, autism, cerebral palsy, tinnitus, speech impediments, learning disabilities, post-traumatic stress, spinal cord injury, phantom limb pain, Parkinson’s disease, multiple sclerosis and fetal alcohol spectrum disorder.

In stroke treatment, for example, the brain has been able to re-learn tasks when a patient repeatedly performs exercises of increasing difficulty. Such treatment has been shown to be effective for most stroke survivors, and can even be valuable years after a stroke has taken place.

Many conditions that worsen over time, such as obsessive-compulsive disorder, gradually alter the structure of the brain. Demonstrating another of Doidge’s principles — “Neurons that fire apart, wire apart” — patients can apply a two-step process of relabelling and refocusing. This builds new circuits that replace the established circuits, and weakens the link between the compulsion and the belief that carrying it out will reduce anxiety.

How can understanding brain plasticity enhance our lives? It now seems clear that people of any age can learn new things and form new habits, and that the concept of “use it or lose it” holds a lot of truth. It’s also increasingly evident that we are able to influence our mental and physical health by taking advantage of our brains’ plasticity. Our increasing understanding of the brain also has societal implications: the cycle of poverty could be broken by creating environments and supports that reduce the damaging effects of early exposures to adversity.

Doidge uses the term “neuroplastic revolution.” In essence, brain plasticity holds out the hope that, in many instances, our brains can be rewired. As we expand our understanding of this remarkable capacity, we come closer to understanding more about our potential as human beings. [a](#)



A

growing body of science is showing us that some brains are more vulnerable to addiction than others. The Alberta Family Wellness Initiative believes this discovery requires a major shift in thinking, but as Bragg Creek writer **Colleen Seto** reports, that can be as challenging as addiction itself

Along the faultlines: reframing our understanding of addictions



When it comes to addiction, new research is changing the way we think about the interaction between what we're born with (our genes) and the lives we lead (our experiences).

Addiction is a chronic condition that affects the brain's reward and motivation systems. But well before an addiction takes hold, brain development plays a critical role in a person's susceptibility to addiction in the first place. Early childhood experiences, as far back as the pre- and postnatal periods, can alter brain architecture in ways that may make addiction more likely.

Nurturing relationships, particularly up to age six, are essential for healthy brain development. Adverse childhood experiences (see *When Growing Up is Hard to Do*, page 41) can lead to toxic stress, which can damage brain architecture, limit brain growth, hinder memory and spatial navigation skills and lower immunity to infection.

Children who live through several adverse childhood experiences (ACEs) may grow up to be adults who have difficulty coping with stress and anxiety— in part because of how their brains were shaped by their experiences during this critical time.

The idea that certain brains are more at risk of addiction requires a major shift in thinking, something that can be as challenging as addiction itself.

The Alberta Family Wellness Initiative (AFWI) was founded by the

Norlien Foundation to give Albertans “a common framework of understanding” about leading-edge science in early childhood development, mental health and addiction. The AFWI works with the Washington, D.C.-based FrameWorks Institute, a non-profit organization that helps translate science and research into everyday language.

TYPES OF ADDICTIONS

Addictions come in many forms and all involve dependence and/or excesses of a particular substance or behaviour. The most common addictions are:

Substance-related:

- Tobacco
- Alcohol
- Street drugs
- Prescription drugs

Behavioural or process:

- Gambling
- Food
- Sex
- The Internet
- Video games
- Work

FrameWork's latest report for the AFWI, *Cracks in the Brain, Enhancing Albertans' Understanding of the Developmental Causes of Addiction*, uses the metaphor of “brain faultlines” to describe new scientific knowledge about how addictions form.

Like a faultline in the earth, people's brains can develop small cracks. In some cases, faultlines appear as the brain develops. They can also develop over time as people experience toxic stress. Other times, people may have been born with faultlines. Just as faultlines in the earth's core can set off earthquakes, faultlines in the brain can affect brain architecture. This physical response is leading us to look beyond the individual to the bigger picture and to identify a whole host of possible developmental causes.

Not every faultline in the brain leads to an addiction. Faultlines must be triggered to cause damage. They can also be prevented and minimized.

Explaining the science

“The science attempts to explain how some people develop addictions, and others don't,” FrameWorks researcher and report author Michael Erard says. “That is, two people can drink a lot, but only one ends up with an addiction. Why? (New) Science explains that some brains are more vulnerable than others, and that this vulnerability has several sources. It can be genetic in nature, meaning that it can run in families.

Reframing how Albertans think about addiction is crucial to changing public policy and making real headway in finding a solution to addiction

Just as faultlines in the earth's core can set off earthquakes, faultlines in the brain also have risks

It can occur through the body's reactions to prolonged and very negative stress. And it can also appear at certain developmental stages, for instance, adolescence, and subside in others."

Using the brain faultlines model, the AFWI is reframing how Albertans think about addiction. The shift is crucial to changing public policy and making real headway in preventing and treating addiction.

"We need to talk about the biological and genetic causes of addiction and not make it out to be someone's destiny or fate," Erard says. "This would lead to not writing off families and even whole

communities because of past histories of addiction. We especially need to lift the moral onus from addiction, and recognize that the roots of addiction can take hold as a result of early childhood trauma."

He adds this could also change how resources are spent for preventing and treating addictions.

For most people living with addictions, overcoming the problem is incredibly hard. Not only do they often face a social stigma, but many addiction treatments do not address any biological factors or address the root cause(s) of addiction.

But this is changing, says Cathy

Pryce, the vice president of Addiction and Mental Health at Alberta Health Services.

"The treatment field is evolving to reflect evidence."

In order to successfully treat addiction, the many factors at play must be recognized and become part of long-term treatment plans. New research about early brain development and its role in addiction offers new optimism in understanding, preventing and eventually overcoming addictions. [@](#)

WHAT WE NOW KNOW ABOUT ADDICTION

New research into brain development and addiction reveals:

- Our brains can have underlying susceptibilities or faultlines
- These faultlines stem from a number of sources, including when brain architecture is formed
- Faultlines are beyond an individual's control
- Faultlines must be triggered to become a problem or addiction
- Faultlines do not always become a problem or addiction
- Faultlines can be recognized and managed.

Need help with an addiction? Here are a few places to start.

The Addiction Helpline

1-866-332-2322

Alberta Health Services' toll-free, 24/7 confidential helpline for Albertans seeking help with and information about alcohol, tobacco, other drugs and gambling.

Alberta Health Services Addiction Resources

albertahealthservices.ca/addiction.asp

A web-based listing of all addiction services and treatment facilities in the province.

Addictions Services Guide

calgaryaddiction.com

An online listing of the services in the Calgary area for people with addiction and associated mental health issues.

KnowMo

knowmo.ca/TreatmentServices.aspx

Know Mo, which stands for knowledge mobilization, offers a list of treatment services in the Edmonton area.



Your family's health

At Alberta Health Services, everything we do comes down to helping your family be healthy and well. Thanks to the outstanding contributions and commitment of our 90,000 health-care professionals, in 2012/2013 we proudly supported families across Alberta by:

- adding more hospital beds
- providing new state-of-the-art-treatments
- offering new programs and services, including ones that give seniors more options for living at home and in the community
- making more health information available online
- supporting decision-making where patients and families live
- recruiting new family physicians and specialists across the province
- investing in research



albertahealthservices.ca

Dr. Tania Oommen

How a learning experience at the Betty Ford Center transformed a psychiatrist's approach to addiction



Photo: Trevor Millions, TUM Photographica

In March 2012, I went to the Betty Ford Center in Palm Springs, Calif., to learn about the treatment of addictions through the Norlien Foundation.

I admittedly went in with many inaccurate preconceptions, expecting perhaps a spa-like resort where rich people not wanting to deal with day-to-day stressors may come to escape reality. That image was shaken quickly and entirely.

I saw patients and staff alike struggle with addictions and for the first time in my training I *really* understood addiction as a disease, with its own set of risk factors; a chronic, progressive and potentially fatal course; and a constellation of absolutely devastating consequences.

It was transformative to be involved with a therapy group comprised of women suffering from addiction. The group included a surgeon, pediatrician,

police officer and business executive. I'll admit that while I dealt with addicts on a daily basis in my medical training, I still primarily held the belief that addiction was a "matter of choice" or "willpower."

There is no way I could continue those beliefs after my experience at the clinic.

I also gained a greater appreciation of the impact of addictions on families and how family members' needs are often unmet in struggles with addiction.


My own approach to patients with addictions has quickly changed since my exposure at the clinic. I find myself more empathetic and a stronger advocate for them. When one patient was labelled as "manipulative" and "borderline," I reminded myself and my team that "she's an addict." Suddenly, her behaviours made sense.

Realizing that—and remembering what I'd learned at the Betty Ford Center

about how even prescription drug use can rapidly escalate in someone with any previous addiction—has certainly affected my prescribing practices.

The staff and patients at the Betty Ford Center were incredibly welcoming, encouraging and hopeful that our group psychiatry residents would approach our patients with addictions differently and share that understanding with our colleagues.

My colleagues and I, who returned from the program, plan on giving presentations to fellow residents and staff to educate them on our experience. We've also wholeheartedly encouraged them to visit the Betty Ford Center if the opportunity is again provided.

It was a remarkable opportunity and experience. 

Dr. Tania Oommen is a chief resident with the University of Alberta's Department of Psychiatry.



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YOUR
OPTIONS**

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- + Health Link Alberta
- + Family Doctor
- + Urgent Care Centre
- + Emergency
- + Walk-In Clinic
- + Community Health Centre

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TOXIC STRESS CAN DAMAGE THE BRAIN

But Prevention and Repair are Possible If We Work Together

Exposure to prolonged abuse or chronic neglect, called "toxic stress," can cause physical changes in a child's developing brain similar to faultlines in the earth. Left unchecked, these faultlines can trigger severe problems later in life, including addiction and other mental health problems. Visit us online to learn how we can work together to prevent or repair damage caused by toxic stress.

