



Early Brain and Biological Development and Addiction, UME

Podcast Series:

INTRODUCTION

- 1 The Neuro-
Developmental Pathway
Origins of Addiction

CORE CONCEPTS OF EARLY CHILD DEVELOPMENT

- 2 Brain Architecture and
Development
- 3 Early Experiences and
Gene Expression
- 4 Building Cognitive
Emotional and Social
Capacities
- 5 **Positive, Tolerable and
Toxic Stress**
- 6 Brain Plasticity and
Behavioural Change
- 7 Intervention and
Treatment in Children's
Mental Health

ADDICTION

- 8 Different Kinds of
Addiction
- 9 Prevention, Intervention
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- 10 Early Trauma in
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Management Model of
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on AFMC.ca



PODCAST 5: Positive, Tolerable and Toxic Stress

STUDY GUIDE | Run time 16:46, Released September 2012

Podcast 5, *Positive, Tolerable and Toxic Stress*, identifies the three types of stress that individuals encounter daily; describes how the body's allostatic response to situations of toxic stress creates the allostatic load; and identifies the sources and long-term effects of toxic stress on a person's body and life. The podcast series has been designed to offer a quick introduction to the subject of early brain and biological development and its connection to addiction. In 10 to 15 minutes, each podcast links specific medical learning objectives with emerging research. Several podcasts also follow the story of Dr. Ray Baker, a physician who has struggled with addiction, to help illustrate the key concepts addressed.

The Association of Faculties of Medicine of Canada (AFMC) created the podcast series based on lectures from the Alberta Family Wellness Initiative, a knowledge mobilization initiative designed to translate scientific research into policy and practice. The lectures have been repurposed, with permission, for undergraduate medical education. Supplementary resources, including virtual patients and a Primer on the Neurobiology of Addiction, are also available on www.afmc.ca.

Learning Objectives:

Once you have listened to this podcast, you should be able to:

- Describe and contrast the three types of stress that individuals experience: positive, tolerable and toxic stress
- Understand the concept of allostatic load, as well as the diseases and internal mechanisms associated with allostatic load
- Identify the sources of toxic stress and the associated developmental impairments in young children
- Explain how stressful situations, such as enduring abuse and family dysfunction, can lead to the development of depression, other illnesses and health risks later in life
- Understand that nurturing, protective relationships and appropriate learning experiences encountered early in life can help to minimize exposure to and the effects of toxic stress

Featured Subject Matter Experts:

This podcast features excerpts from the following lectures:

- [Stress and Neurobehavioral Development in Childhood](#)
Dr. Megan Gunnar, Professor of Child Development, University of Minnesota
- [Residual Effects of Early Life Stress into Adulthood: Biological Mechanisms](#)
Dr. Matthew Hill, Assistant Professor, University of Calgary

Listeners are encouraged to learn more about the subject matter through their interactions with patients, research and by checking out the AFWI lecture series available at www.albertafamilywellness.org.

POSITIVE STRESS, toxic stress, Allostatic Load, BRAIN, Brain architecture, epigenetics, Addiction, CHILDHOOD DEVELOPMENT, ADVERSE CHILDHOOD EXPERIENCES. Stress



Key Learning Points:

- Individuals experience three types of stress: positive, tolerable and toxic stress
- Positive and tolerable stress build resilience, whereas toxic stress negatively impacts brain structure development
- Common sources of toxic stress include abuse and neglect, which, in children, can lead to delays in the development of social, cognitive and emotional skills
- Stressful situations, such as enduring abuse and family dysfunction, can lead to the development of depression and other illnesses or to health risks (such as anxiety and addiction) later in life
- Nurturing, protective relationships and appropriate learning experiences encountered early in life can help to minimize exposure to and the effects of toxic stress

Reflective Questions:

1. In your role as a medical student or practising physician, how would you integrate and apply what you have learned about positive, tolerable and toxic stress? Does what you have learned inform how you might manage your own stress?
2. Do you think an interface exists between stress and the other determinants of health?
3. When and how do you think it would be appropriate to address early childhood issues with someone struggling with addiction? What professional skills would be required to do so? How could you maintain patient safety?
4. How would you address the problem of a parent or family subjecting a child to “toxic stress”?

Acknowledgements

DEVELOPED BY:

The Association of Faculties of Medicine of Canada

PRODUCED BY:

Hugh Kellam, PhD Candidate, Instructional Designer, University of Ottawa

Colla MacDonald, PhD, Project Manager & Education Expert, University of Ottawa

SPONSORED BY:

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ADVISORY COMMITTEE:

Niloofer Baria, MD, CCFP, Addiction Medicine Program Committee, College of Family Physicians of Canada

Nancy Brager, MD, FRCPC, Associate Professor, University of Calgary

Peter Butt, MD, CCFP, FCFP, Addiction Medicine Program Committee, College of Family Physicians of Canada

Gary Hnatko, MD, FRCPC, FCPA, Professor, University of Alberta

Lucie Rochefort, MD, MSc., CCMF, FCMF, Addiction Medicine Program Committee, College of Family Physicians of Canada

Nicole Sherren, PhD, Scientific Director & Program Officer, Norlien Foundation

Pamela Weatherbee, Medical Student, University of Calgary

Jonathan White, MD, PhD, FRCSC, MSc, Assistant Professor, University of Alberta

Preparing for your exams...

Medical Council of Canada (MCC) Objectives for the Qualifying Examination (excerpt):

59 MOOD DISORDERS Rationale: Depression is one of the top five diagnoses made in the offices of primary care physicians. Depressed mood occurs in some individuals as a normal reaction to grief, but in others it is considered abnormal because it interferes with the person's daily function (e.g., self-care, relationships, work, self-support). Thus, it is necessary for primary care clinicians to detect depression, initiate treatment, and refer to specialists for assistance when required. **Causal conditions:** 1. Depressive disorders; 2. Depression with associations; 3. Grief and bereavement; 4. Depression with manic episode (Source: [MCC Objectives for the Qualifying Examination: 59 Mood Disorders](#))

74 PERIODIC HEALTH EXAMINATION (PHE) Rationale: The periodic health examination (PHE) represents an opportunity for the prevention or early detection of health-related problems. The nature of the examination will vary depending on the age, sex, occupation, and cultural background of the patient. **Conditions to consider based on patient age:** 2. Infant and child: b. Abuse/neglect **Key objectives:** Given a patient presenting for a PHE, the candidate will determine the patient's risks for age and sex-specific conditions to guide the history, physical examination, and laboratory screening. (Source: [MCC Objectives for the Qualifying Examination: 74 Periodic Health Examination \(PHE\)](#))

Other relevant objectives:

[69 ANXIETY](#)

[103 ADDICTIONS/SUBSTANCE ABUSE](#)

CanMEDS-FMU Undergraduate Competencies from a Family Medicine Perspective

(excerpt):

2. THE FAMILY MEDICINE COMMUNICATOR

2.2 Demonstrates a willingness to become involved in the full range of difficulties which patients bring to their physicians and not just their biomedical problems. (Source: *CanMEDS-FMU Undergraduate Competencies from a Family Medicine Perspective: 2. The Family Medicine Communicator*)

