Cognition, Communication, And Clinical Reasoning

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Background

- Physiotherapist (1988)
- McKenzie Diploma (1998)
- Editor, MIUSA / MII Journals (1998 - 2006)
- Educator (PT; PTA) (1995 - present)

Background

- Endurance sports coach
  - running, triathlon
- Top 20 pro, Ironman World Championships, Kona, HI
- Sub-24:00 finisher at Western States 100 Mile Endurance Run
- Gold medalist, 800m and 1500m, 2011 World Masters Athletics

Background

"RunSmart: A Comprehensive Approach To Injury-Free Running" (2008)

"Running Injuries: Etiology And Recovery-Based Treatment" (with Bridget Clark, PT) in 3rd edition of "Clinical Orthopedic Rehabilitation" (2011)

Smart Life Project™

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Objectives

- Identify the primary components of the clinical reasoning process
- Define and discuss pertinent information related to cognition (including perceptions, beliefs, thinking, and logic) in order to provide a broad foundation for clinical reasoning

Objectives

- Understand the role of feedback loops in the clinical reasoning process
- Identify the principles and steps involved in communication (verbal and non-verbal) and the limiting factors related to each

Objectives

- Integrate the research on cognition (including logic, cognitive biases, and logical fallacies) into clinical examination skills
- Discuss the use of effective communication skills (verbal and non-verbal) in enhanced clinical reasoning

Agenda

0:00:00	Introduction and Overview
0:10:00	Model Of Cognition And Clinical Reasoning
0:20:00	Perceptions And Belief Systems
0:40:00	Self Image
0:50:00	Cognitive Bias And Logical Fallacies
1:10:00	Verbal Communication Skills
1:25:00	Non-Verbal Communication Skills
1:40:00	Clinical Applications
1:55:00	Question And Answer

Introduction

Introduction

One patient …

… One clinician …

… One treatment room …

Introduction

"The patient will always have one witness and the clinician has none."

(Sunderland, 1978)

Introduction

"Every patient contains a truth. He will proffer the data on which diagnosis rests. The doctor must adopt a conscious humility, not towards the patient, but towards the truth concealed within the patient, if his interpretations are regularly to prove correct."

(Cyriax, 1982)

Introduction

"The patient is the most valuable source of information and our ability to extract that information will determine our depth of understanding and, subsequently, our ability to manage the patient's problem"

(Jones, 1992)

Introduction

"Seek first to understand,
then to be understood"

(Covey, 2004)

Introduction

- How do we think?
- How do we perceive the world around us?
- How do we use these thinking skills in clinical reasoning?

What Is Clinical Reasoning?

- Content (knowledge): the stuff we know
- Process (cognition): how we think
- Integration (metacognition): “thinking while doing”

Principles And Practices

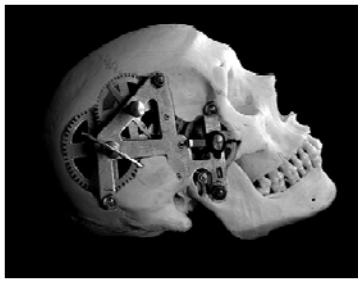
Principles = Why

Practices = What

Thinking

- Educational programs present students with many “tools for their toolbox”
- Do educational programs teach new clinicians how to think?

Learning How To Think



Normal Brain Function

- Linear thinking
- Non-linear thinking

Linear Thinking

- Reductionist / algorithmic
- Behavior of the whole can be understood from the properties of the parts
- Traditional educational model

Non-Linear Thinking

- Heuristic
- Essential properties of the whole arise from interactions and relationships of the parts
- “Big picture” thinking
- The way our brain functions normally

Thinking

- Educational programs emphasize linear thinking
- Do educational programs promote normal brain function and non-linear thinking?

Cognition

"Knowledge is a mental grasp of a fact(s) of reality, reached either by perceptual observation or by a process of reason based on perceptual observation".

(Rand, 1966)

Cognition

"The mental act or process by which knowledge is acquired, including perception, intuition, and reasoning"

Cognition

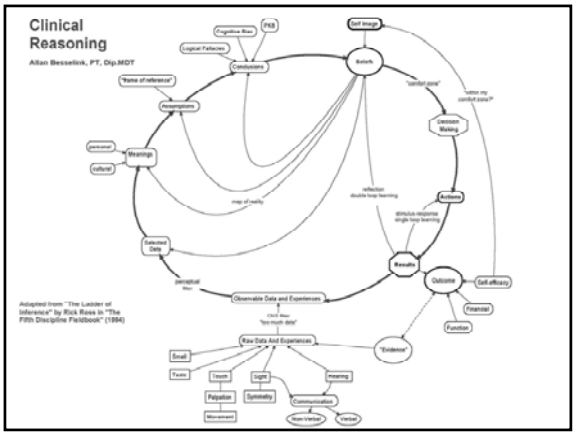
- Cognition refers to thinking processes and involves awareness, perceptions, recognition, judgment, reasoning, beliefs, values, and expectations.

Cognition

- What takes place inside the brain?
- What are the thinking processes?

- Proposed model has been adapted from the “Ladder Of Inference” by Ross (1994)

Model Of Clinical Reasoning



Model Of Clinical Reasoning

1. Raw data and experiences
2. Observable data
3. Selected data
4. Meanings
5. Assumptions
6. Conclusions (cognitive bias, logical fallacies, personal knowledge base)

Model Of Clinical Reasoning

7. Beliefs
8. Decision making
9. Actions
10. Results / Outcomes

… lather, rinse, repeat

Reality

"Reality, the external world, exists independent of man's consciousness, independent of any observer's knowledge, beliefs, feelings, desires or fears … and that the task of man's consciousness is to perceive reality, not to create or invent it."

(Rand, 1943)

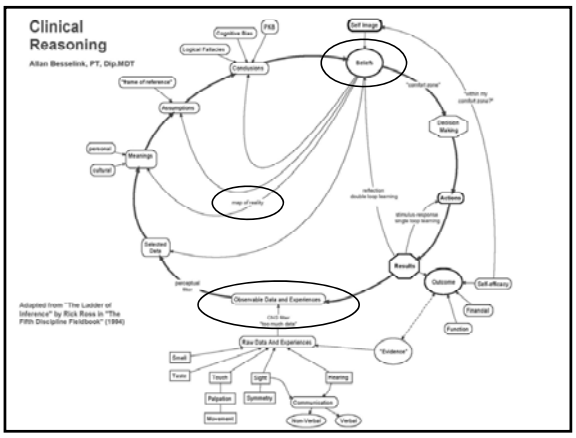
Maps Of Reality

- There is one external world, one reality
- Each of us has our own map of reality – which isn't any better or worse than any other.
- We respond to our maps, rather than directly to the world

Reality

- One picture, but two (or more) maps of reality
- Do you see an old woman? Or a young lady?

Perceptions And Beliefs



Perceptions And Beliefs

- My map of reality is based on …
  - raw data
  - observable data
  - meaning – personal / cultural
  - assumptions
  - conclusions
  - beliefs

Filters

- Excessive amounts of raw data filter into our senses – at a rate of 2000 bits per second
- I can't cope!
  - I must select what is necessary within the current context
- Perceptual filters allow us to select data that supports our beliefs

Perceptions And Beliefs

- After filtering data … we …
  - Add meanings (personal/cultural)
  - Make assumptions (based on meanings)
  - Draw conclusions
  - Adopt beliefs
  - Take actions based on our beliefs

Beliefs

- Conclusions are affected by cognitive bias, logical fallacies, and personal knowledge base
- Self image has a huge impact on beliefs

Belief Systems

The impact of our belief systems may be greater than the evidence

Ross (1994):

- "Our beliefs are the truth;
- The truth is obvious;
- Our beliefs are based on real data;
- The data we select are the real data"

Evidence

Evidence

1. that which tends to prove or disprove something; ground for *belief*; *proof*.
2. something that makes plain or clear.
3. data presented to a court or jury in proof of the facts in issue and which may include the testimony of witnesses, records, documents, or objects.

Beliefs

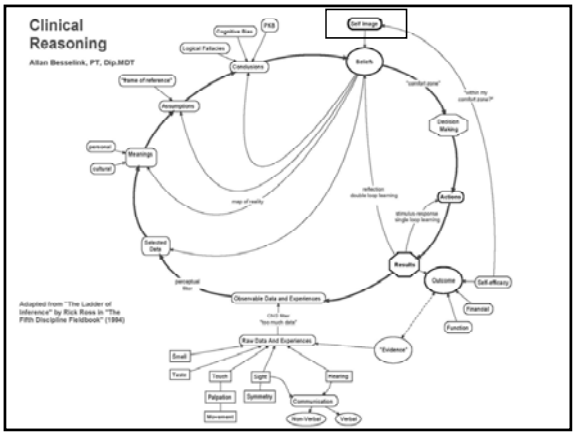
- Evidence isn't always enough – beliefs can over-ride the best evidence
- Examples:
  - Flat Earth Syndrome
  - "Evidence-based medicine"

Belief Systems

"The inability to challenge our belief systems in the face of good scientific evidence is the primary limiting factor in the advancement of both health care and coaching, as well as human performance and injury prevention"

(Besselink, 2008)

Self Image



Self Image

- How we see ourselves further defines how we look at the world and our map of reality

Self Image

- Perceived competence and self efficacy is derived from how we are treated, especially in the early years of our lives
- How we are treated affects how we see ourselves, which in turn affects how we treat others, and how we are treated by others

Self Image

- We make the best choices available to us - given the context, our map of reality, and our self image
- We have behaviors and actions consistent with our self image

Self Image

- Every behavior is appropriate given the context in which it was established, from the point of view of the person whose behavior it is and their self image
- Examples:
  - Criminals

Comfort Zones

- We seek to maintain our comfort zones, or broach their limits in a very gradual, controlled fashion
- We will do whatever it takes to maintain our comfort zones
- Addiction as a behavioral model for comfort zones and self image

Self Image

- High self image:
  - Perceived high self competence and self efficacy
  - High upper limit of comfort zone
  - Functional, positive relationships
  - Interdependence

Self Image

- Low self image:
  - Perceived low self competence and self efficacy
  - Low upper limit of comfort zone
  - Dysfunctional relationships
  - Self sabotage
  - Codependence

Self Image

- Example of low self image (self sabotage, low self efficacy) = alcohol addiction
- Professed knowledge of situation may be very high
- Persistent self sabotaging behaviors
- Actions are consistent with self image

Self Image

- Patient
- Clinician

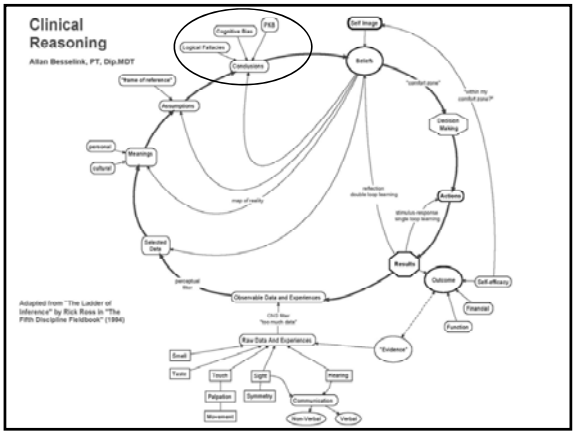
Clinician Self Image

Do you see yourself as a “guru” …
… or a “healer” …
… or an “investigator” …
… or a “facilitator” …
… or an “entertainer” while nature takes its course? ☺

Comfort Zones

- As a clinician, we must challenge our own comfort zones, self image, and belief systems
- My experience with McKenzie Part A in 1994 … it was a dark and stormy night …

Conclusions



Cognitive Bias

- Cognitive Biases are psychological tendencies that cause the human brain to draw incorrect conclusions.
- These biases are a common outcome of human thought, and often drastically skew the reliability of anecdotal and legal evidence.

Cognitive Bias

- Four primary types:
  - social
  - memory
  - decision-making
  - probability/belief

Cognitive Bias

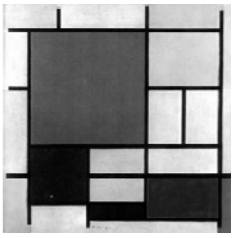
"We contaminate our perspective with bias, and bias will be our downfall when we allow our preconceived ideas about practice to undermine the development of newer and more effective treatments."
(DiFabio, 1997)

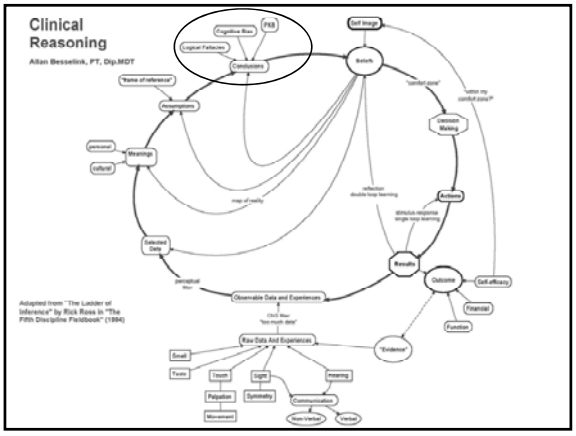
Cognitive Bias

- We all impose our bias when drawing conclusions
  - Observer bias
  - Recall bias
- This can be effected by evidence but more importantly by beliefs about the world and our self

Cognitive Bias

- "Painting from your frame of reference"
- Is this art?





Logical Fallacies

- Logical Fallacies are, simply, mistakes or errors in reasoning.
- They are most commonly grouped into three general classes: fallacies of relevance, fallacies of presumption, and fallacies of ambiguity.

Logical Fallacies

- *Fallacies of Relevance:* Fallacies of relevance are attempts to prove a conclusion by offering considerations that simply don't bear on its truth.

Logical Fallacies

- *Fallacies of Presumption:* Fallacies of presumption begin with a false (or at least unwarranted) assumption, and so fail to establish their conclusion.

Logical Fallacies

- *Fallacies of Ambiguity (Sophisms):* Fallacies of ambiguity appear to support their conclusions only due to their imprecise use of language.

Logical Fallacies

"… almost all the errors of thinking are errors of perception. In real life, logical errors are quite rare. Yet we persist in believing that thinking is all a matter of avoiding logical errors … if your perception is limited then flawless logic will give you an incorrect answer ….

Logical Fallacies

"… Bad logic makes for bad thinking. Everyone would agree with that. But the opposite is not true at all. Good logic does not make for good thinking. If the perception is poor then good logic will give you a faulty answer."

(de Bono, 1994)

Logical Fallacies

"A contradiction cannot exist … no concept man forms is valid unless he integrates it without contradiction into the total sum of his knowledge. To arrive at a contradiction is to confess an error in one's thinking; to maintain a contradiction is to abdicate one's mind and to evict oneself from the realm of reality".

(Ayn Rand)

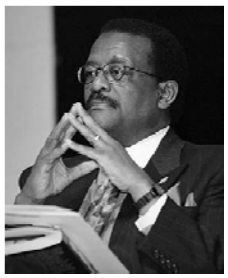
Logical Fallacies

"Medical research into errors of reasoning has shown that failure to attend to features which are missing and overemphasis on features which support the clinician's 'favorite hypothesis' are the most common errors made"

(Elstein, 1978)

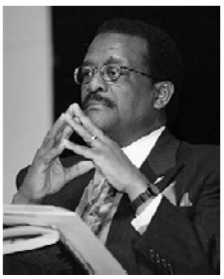
Logical Fallacies

- "Your favorite hypothesis" – making the details fit
- Example: the perceived causes of back pain
  - What do we truly know about it?



Logical Fallacies

- "If the glove doesn't fit, you must acquit"



Causality And Correlation

- The "quantum leap" between causality and correlation

Causality And Correlation

- Causality
  - the relation between causes and effects
- Correlation
  - a statistical relation between two or more variables such that systematic changes in the value of one variable are accompanied by systematic changes in the other

Causality And Correlation

"Cause and effect, therefore, is a universal law of reality. Every action has a cause … and the same cause leads to the same effect (the same entity, under the same circumstances, will perform the same action)"

(Peikoff, 1991)

Causality And Correlation

"A thing cannot act in contradiction to its nature"

(Rand, 1957)

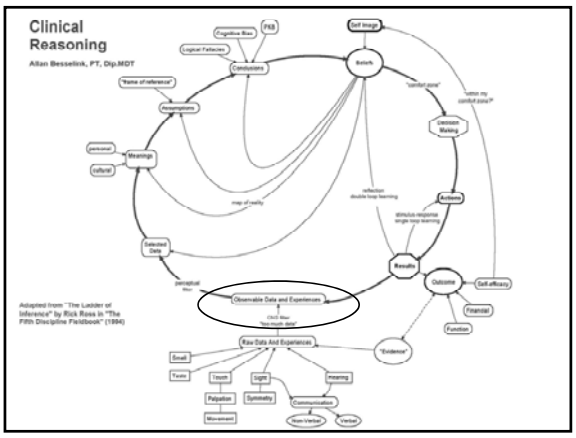
To consider …

- Running injuries …
- Causality?
- Correlation?

To consider …

- Low back pain
  - MRI
  - Asymmetries
  - Palpation
- Causality?
- Correlation?

Communication



Communication

- When interactions take place between people, we are subjected to the beliefs, values and perceptions of each other
- These will be manifested in our communication, our behaviors, and our actions

Communication

- Effective communication is the cornerstone of clinical reasoning

Communication

"The learning of this art or skill requires patience, humility, clarity and self-criticism. Without them, good rapport with patients will not be achieved."

(Maitland, 1986)

Communication

- You cannot NOT communicate
- Words account for 7% of meaning; non-verbal account for 55% of meaning
- The meaning of your communication is the response you get

Communication

- Maitland 1986
- 9 steps per question … how many questions in a 15 – 20 minute subjective examination?
- "The Snowball Effect"

Step 1

- The reasoning behind the question which is to be asked
  - Error: insufficient theoretical and clinical knowledge; content; relevance

Step 2

- Wording the question
  - Error: question does not clearly ask what the clinician needs to know

Step 3

- Hearing and understanding the questions
  - Errors: May not understand words; patient bias

Step 4

- Considering the reply
  - Error: assumptions regarding the reason for asking the question; incomplete and/or inaccurate recall

Step 5

- Putting the answer into words
  - Error: lack of experience in doing so in this environment

Step 6

- Hearing and understanding the words used in the patient's answer
  - Error: assuming the meaning, rather than clarifying the answer

Step 7

- Interpreting the answer
  - Error: based on experience, beliefs, assumptions

Step 8

- Relating the answer to the question
  - Error: attention to one piece of information; accepting the patient's answer as providing all necessary information (even if it doesn't)

Step 9

- Determining the next question
  - Error: insufficient knowledge from previous question

Feedback Loops

- Communication is just a repeating "stimulus – response"
- "If you do what you've done, you will get what you've got"

Feedback Loops

- *Therapist*
  - --- establish the intent of the question based on knowledge, experience, perceptions, and beliefs
  - --- ask the question

Feedback Loops

- *Patient*
  - --- hears the question
  - --- processes information based on perceptions, beliefs, and expectations
  - --- formulates and produces a response

Feedback Loops

- *Therapist*
  - --- hears the response
  - --- processes information based on perceptions, beliefs, and expectations
  - --- compares response to initial question and formulates next action

Ineffective Communication

- Need I say more? ☺

Communication

"When communication mistakes do occur during this learning process, the physiotherapist should look to herself for the mistake and not blame the patient"

(Maitland, 1986)

Verbal Communication

- Wording skills
  - Introducing bias into the equation
  - “Asking leading questions”
- Brevity and expressing thoughts clearly
  - “I know that you believe you understand what you think I said, but, I am not sure you realize that what you heard is not what I meant”

Verbal Communication

- Questions must be flexible and never dogmatic
- Listening must be open-minded and non-judgmental.
- Listening is active, hearing is passive!

Verbal Communication

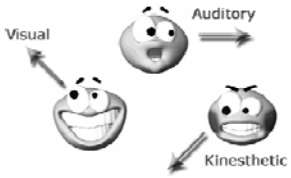
- Provision of the opportunity for the patient to offer spontaneous information (“10 second rule”)
- Using the patient’s own words – recapping and clarifying all information. Do not assume!

Non-Verbal Communication

- Accounts for the greatest percentage of communication between two people – yet may also be the one area we think about the least

Rapport

- What is the person's preferred learning style?



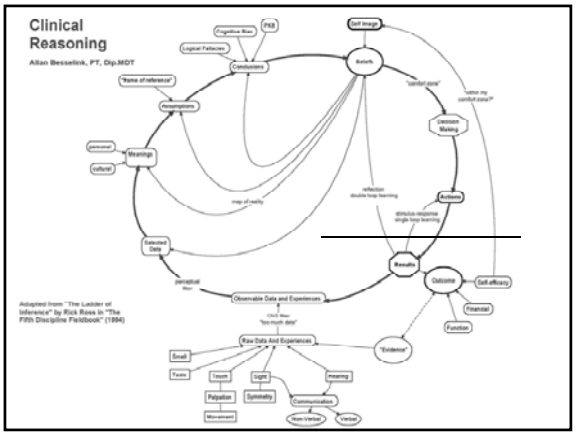
Rapport

- Clinicians can use a number of verbal tools to help establish rapport
  - Matching content via preferred learning style (VAK)
  - Matching pacing of speech, movements, and breathing
  - "Parroting" keywords
  - Paraphrasing
  - Similar complexity and jargon

Rapport

- Clinicians can use a number of environmental tools to help establish rapport:
  - Body postures – closed vs. open
  - Position of clinician in relation to patient (off to side vs. directly in front; eye level)
  - Proximity

Clinical Applications



Clinical Applications

- The keys to becoming an “expert clinician”:
  - Cognition
  - Communication
  - Clinical reasoning

Clinical Applications

“If you listen to the patient, they will tell you what is wrong”

(Besselink, daily)

Goals Of Clinical Reasoning

- Understand the “big picture”
- What is the “essence” of their problem
- What does their map of reality look like?
- What impact does our map of reality have on clinical decision-making?
- Can we work with the patient to establish “solutions” and not just more “problems”?

Subjective History

"If he or she wishes to obtain a large range of detailed information it must be realized that much of it will be irrelevant or unreliable. If we limit the amount of information, we will increase it's reliability and relevance"

(McKenzie, 1979)

Six Questions

"I have six trusting serving boys who have always served me well, They are how and why and what, when and where and who"

(Rudyard Kipling)

Three Keys

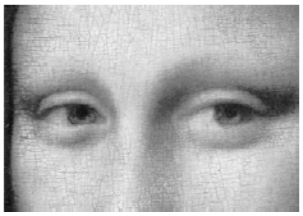
- Intent – "having something in mind as a plan or design"
- Relevance – "relation to the matter at hand"
- Attention to one piece of information

Metacognition

- "Thinking while doing" - the act of reflection during (and after) the clinical reasoning process.
- *"Relaxed concentration is the key to excellence in all things"*

  (W. Timothy Gallwey)

Pattern Recognition



- It's not all about what you know –
- it's about how you use what you know

Pattern Recognition

- Process can be far more important than content
- Expert clinicians display a higher level of pattern recognition

Errors In Clinical Reasoning

- "The favorite diagnosis" – i.e. Sacroiliac joint pain
  - In some clinics, everyone that has PSIS tenderness has an SI problem!
  - Belief
  - Incidence (evidence)

Errors In Clinical Reasoning

- "Maintaining a contradiction"
  - Palpation is unreliable
  - I was taught palpation
  - It works for me
  - I use it, and it continues to be taught
  - But what about the unreliability? Do I use it nonetheless?
  - Emotional debate based on beliefs!

What Am I Not?

- In the clinical reasoning process, we are not trying to rule IN, we are trying to rule OUT
- That process always leaves us with two options – what we think the problem is, and the ?
- Make all efforts to prove your own thinking incorrect

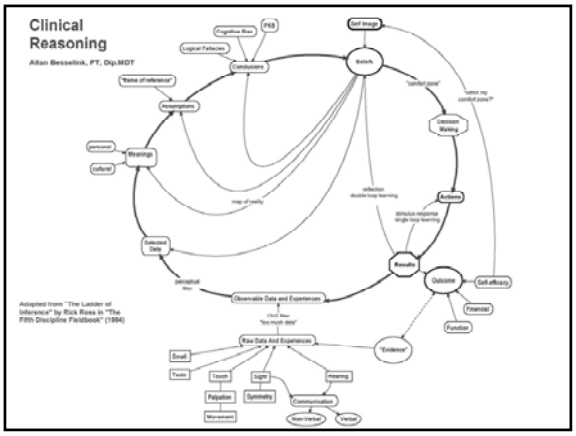
Clinical Applications

- Worker's compensation
- Exercise adherence
- Fear of success and "compliance"
- … etc …

- Answers may be found while paying attention to:
  - Beliefs
  - Behaviors and actions
  - Self image

Clinical Applications

- What is the patient's perceived level of competence and self efficacy?
- What is the clinician's self perception regarding their role in the patient's care?
- Causality and correlation – for the patient? For the clinician?



Question And Answer

For More Information:

- Smart Life Project
  - www.allanbesselink.com/slp
- "RunSmart: A Comprehensive Approach To Injury-Free Running"

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The Finish Line Is Upon Us!

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