



# Events and Causal (Conditional+) Factors Analysis

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# ECFA and ECFA+

- ECFA – Buys and Clark 1995
  - Assists in verifying the sequence of events leading to the incident and the possible causal factors for each event
  - Provides a structure for integrating investigation findings
  - Assists communication during the procedure as it must be a team approach
  - Assists communication in reporting back the findings

# ECFA and ECFA+

- ECFA+ - The Noordwijk Risk Initiative Foundation
  - Further refinement of the ECFA through experiences gained over a decade

◦ The Noordwijk Risk Initiative Foundation

# ECFA (Buys and Clark)

- Incidents rarely simple and almost never result from a single cause
  - Multifactoral
    - Human factors
    - Environmental conditions
    - Omissions
    - Oversights
    - Performance related
  - Different conditions may affect different elements of the incident

# ECFA (Buys and Clark)

- The incident and its component elements
- The conditions that created incident situations
- The managerial control systems that let them develop
  - To identify the root causes by understanding the interaction of events and causal factors through a chronological chain of activity
    - starting with an initiation event through to the final event of the incident

# ECFA (Buys and Clark)

- Will help to
  - Organise the data on the incident
  - Guide the investigation
  - Validate and confirm the true incident sequence
  - Identify and validate factual findings, probable causes and contributing factors
  - Simplify organisation of the investigation report
- Not used in isolation
  - Most effective when used in conjunction with other tools

# ECFA (Buys and Clark)

- Will help to clarify responsibilities and reduce incidents by
  - Providing a cause-oriented explanation
  - Providing a basis for change
  - Helping to delineate areas of responsibility
  - Acting as an operational training tool
  - Providing an effective aid to future systems design

# ECFA (Buys and Clark)

- Aids in developing evidence by
  - Detecting all causal factors
  - Illustrating multiple causes
  - Providing a visual representation of interactions and relationships
  - Illustrating the chronology of events
  - Providing a flexible interpretation
  - Linking specific factors to organisation and management control factors



# Retrospective: Events and Causal Factors Analysis

- Representatives of all professionals involved
- Presented with an incident
  - Analysis in terms of
    - Clearly identifying and mapping the primary event
    - Considering possible
      - contributory factors
      - Systemic conditions
      - Systemic factors

# ECFA - Events and Causal Factors Analysis



Typical ECFA work team using PostIt and a White board

# ECFA - Events

Events



What, When, Who

1. Define what you consider to be the primary incident – what actually happened- and enter the individual events in sequence in the central row
2. Track in logical progression from beginning to end (try to define the logical sequence)

# ECFA - Events

Events



What, When, Who

1. Important that you describe an actual occurrence and not a condition
2. Events are active so use a verb for each event and be precise
3. Describe each event separately

# ECFA - Events

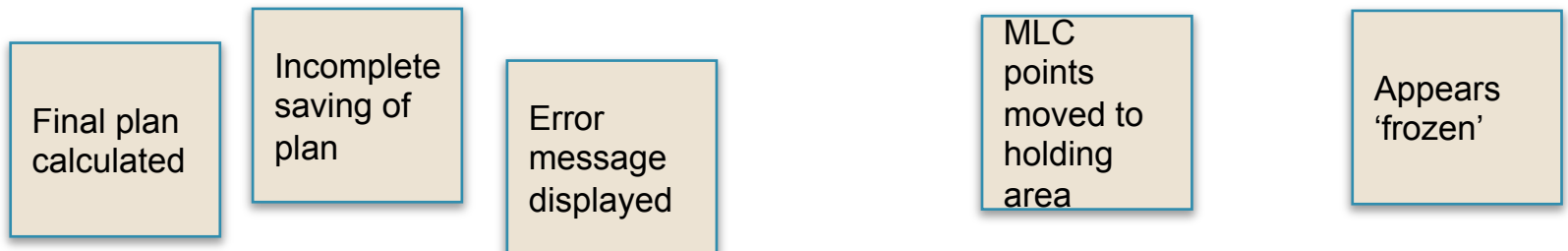
Events



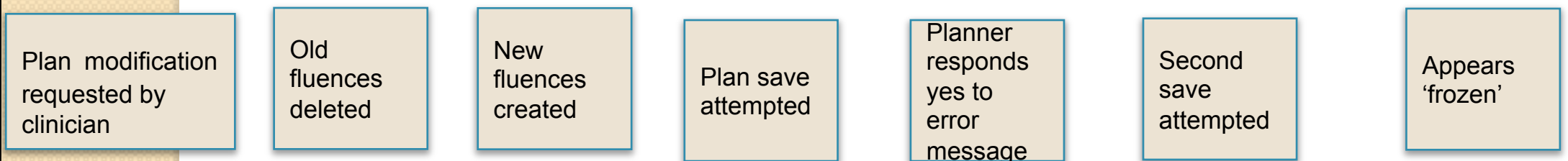
What, When, Who

1. If appropriate define what you consider to be secondary events and place these in the rows above or below the primary event

# Primary and Secondary events

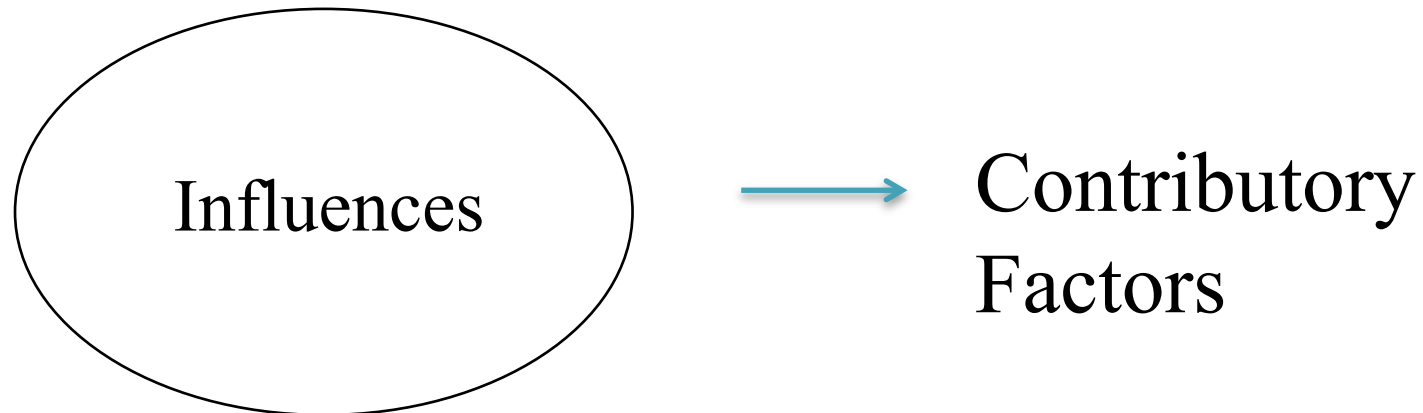


Secondary events

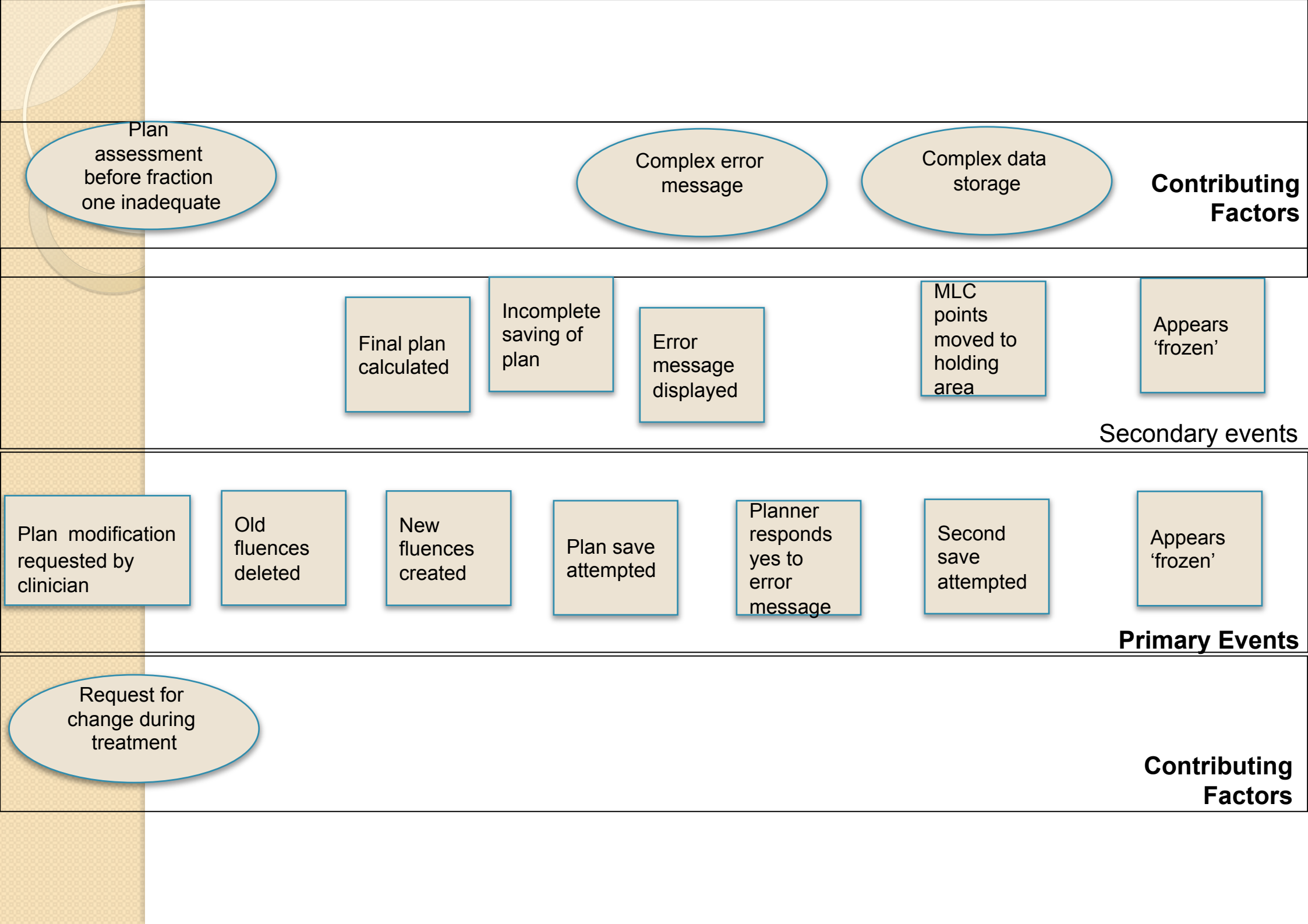


Primary Events

# ECFA - Contributory factors



1. Describe states or circumstances
2. Passive and not active
3. Conditions that could have influenced the event or if they had been different might have resulted in a different outcome



Plan assessment before fraction one inadequate

Complex error message

Complex data storage

**Contributing Factors**

Final plan calculated

Incomplete saving of plan

Error message displayed

MLC points moved to holding area

Appears 'frozen'

**Secondary events**

Plan modification requested by clinician

Old fluences deleted

New fluences created

Plan save attempted

Planner responds yes to error message

Second save attempted

Appears 'frozen'

**Primary Events**

Request for change during treatment

**Contributing Factors**



# The exercise - Events

1. Read the incident carefully
2. Transcribe all the actions onto individual post-it notes
3. Place on the chart in what you consider the sequence to be
4. Review

# The exercise – Conditions/ Contributory factors

1. Consider the conditions that existed when the incident occurred
2. Write all the conditions on post-it notes
3. Match conditions with the different elements of the incident
4. Add conditions to the chart
5. review



# The exercise – Conditions/ Contributory factors

1. Identify what you consider to be systemic conditions or systemic factors
2. Review and agree on your final configuration

# Retrospective: Events and Causal Factors Analysis

