

Telephone and web-based decision support and triage;

Standardizing The Response To Public Health Emergencies

Barry W. Wolcott MD

Associate Professor

Department of Operational and Emergency Medicine

Uniformed Services University, Bethesda, MD 20814

Disclosure

- n Dr. Wolcott currently serves as Chief Medical Officer of Expert-24US, LLC.
- n Expert-24US LLC. is a vendor of proprietary decision support software tools for creating and deploying web-based expert systems.

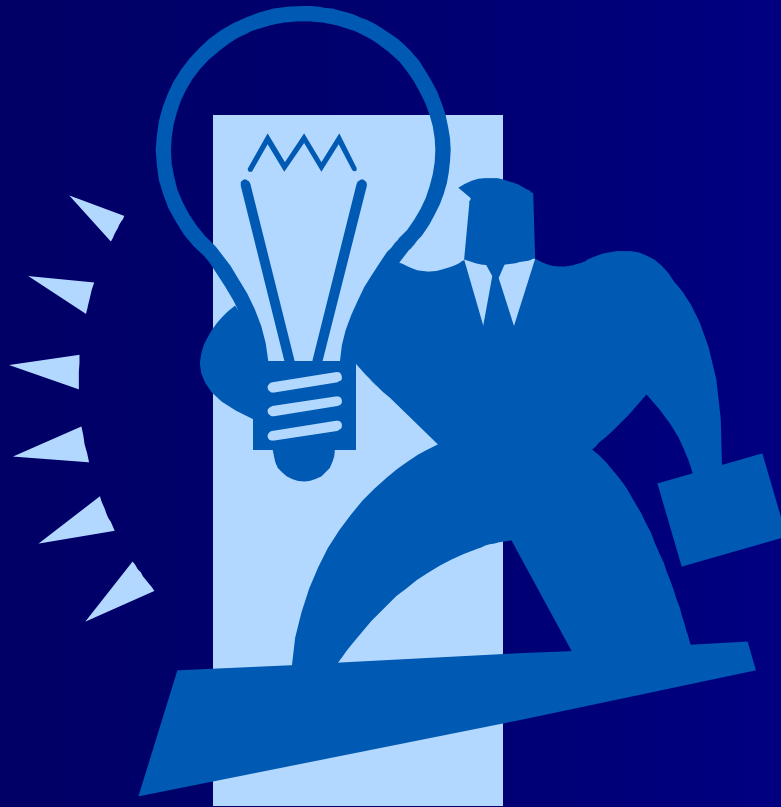
It's Not Really A Disaster, Until ...

... the job to be done is "way too big" to be accomplished relying upon the "usual methods."

Otherwise ...

... "it's not really a disaster you are just working very, very hard!"

Disaster-Response Strategies



§ Brute Force

§ Outside-the-box

Brute Force Strategies

- n Import additional traditional resources to the scene:
 - Utility response to weather-damaged power lines;
 - Hospital emergency operation plans;
- n Ineffective when planned on the “spur-of-the-moment.”
- n A flu pandemic response will preclude such strategies.

Outside-the-Box Strategies

- n Utilize non-traditional resources and/or processes:
 - Airdrop animal fodder;
 - Airline security agents screen travelers with URI symptoms;

- n Ineffective when planned on the “spur-of-the-moment.”

- n A flu pandemic response will benefit from such strategies ... basis for conferences such as this one.

Underlying Thesis:

- n Mounting an effective response to an influenza pandemic will be made less difficult by rapid, large-scale implementation and adoption across both lay and professional populations of pre-approved, standardized, decision-support tools guiding responses to specific problems ...

Pandemic Examples

Identification of individuals meeting predetermined criteria for:

- n Immunization
- n Chemoprophylaxis
- n Rapid diagnostic testing
- n Diagnosis
- n Chemotherapy
- n Hospitalization
- n Ventilator support

Problems

- n Determining precisely what is best/least bad medically and socially for a population overall;
- n Getting individuals within that population to personally do what is best/least bad medically and socially for the group overall.

My "Outside-The-Box" Suggestion:

Triage/Resource
allocation via:

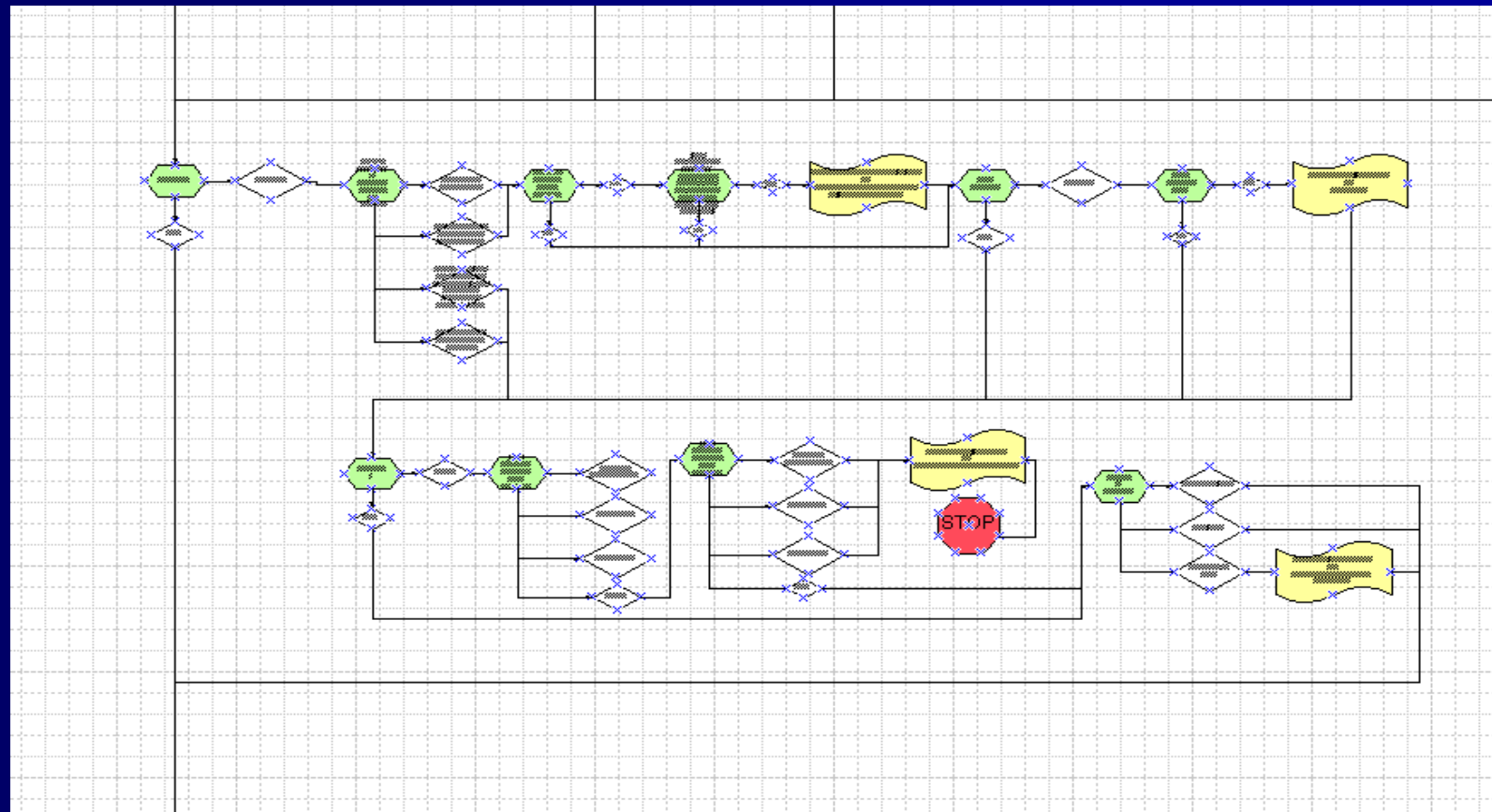
- Call Centers
- Web-sites



Symptom Triage/Nurse Advice Call Centers

- n Began in mid-1980's;
- n Replace "answering services" of individual medical offices;
- n Substitute RNs supported by computerized, physician-written/approved decision trees for wide range of acute complaints;
- n Identify for each caller the "most appropriate next step" to deal with their problem ... ranging from "Call 911" to "Watchful waiting and self-care."
- n Many millions of calls taken annually.

Expert Logic



Call Center RN Support Tool

Telephone Consult for Barry Wolcott, a 63 year old man



- Encounter record
- Symptom Assessment
- Wellness
- Medical Information
- Follow up

<p>Cold symptoms Restart</p> <p>Does he have any of the following possible emergency symptoms?</p> <ul style="list-style-type: none"><input type="checkbox"/> [NEWLY confused or unable to stay alert and awake]<input type="checkbox"/> Feeling like he is going to pass out every time he stands (or sits) up<ul style="list-style-type: none"><input type="checkbox"/> Blue lips, skin or nail beds<input type="checkbox"/> Newly stiff or painful neck<input type="checkbox"/> Purple or red rash/blotches that stay when pressed by a glass<input type="checkbox"/> Muffled voice or inability to open jaw<ul style="list-style-type: none"><input type="checkbox"/> Pain, pressure or tightness in the chest, jaw or arm<input type="checkbox"/> Making an effort to breathe, even whilst inactive or resting<input type="radio"/> None of the above <p>< Back Next ></p>	<p>Information icon text</p> <p>Please select an information point.</p> <hr/> <p>Call note: (please type notes below)</p> <p>Triage nurse call: Anonymous caller is calling on behalf of Barry Wolcott, a 63 year old man with cold symptoms</p>
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Call Center RN Support Tool

Telephone Consult for Barry Wolcott, a 63 year old man

Encounter record Symptom Assessment Wellness Medical Information Follow up

Cold symptoms

Restart

How long has he had cold symptoms?

- Less than 72 hours (3 days)
- Less than 1 week
- 1 to 2 weeks
- More than 2 weeks

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Information icon text

Please select an information point.

Call note: (please type notes below)

Triage nurse call: Anonymous caller is calling on behalf of Barry Wolcott, a 63 year old man with cold symptoms

Ability to swallow.

Pertinent negatives:

No: New confusion or inability to stay alert and awake; Feeling like he is going to pass out every time he stands (or sits) up; blue lips, skin or nail beds; stiff or painful neck; purple or red rash/blotches that stay when pressed by a glass; muffled voice or inability to open jaw; pain, pressure or tightness in the chest, jaw or arm or making an effort to breathe, even whilst inactive or resting.

Symptom Assessments:

Cold symptoms (incomplete)

Call Center RN Support Tool

Telephone Consult for Barry Wolcott, a 63 year old man

Encounter record

Symptom Assessment

Wellness

Medical Information

Follow up

Cold symptoms

Restart

Which of the following symptoms is he experiencing?

- Fever
- Blocked or runny nose
- Sore throat
- Sneezing
- Watery, red eyes
- Very itchy eyes, nose or throat
- Cough
- Headache
- Pain in cheeks or forehead over sinuses
- Severe widespread muscle aches
- Extreme fatigue
- None of the above

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Information icon text

Please select an information point.

Call note: (please type notes below)

Triage nurse call: Anonymous caller is calling on behalf of Barry Wolcott, a 63 year old man with cold symptoms

Ability to swallow.

Duration of cold symptoms less than 72 hours (3 days).

Pertinent negatives:

No: New confusion or inability to stay alert and awake; Feeling like he is going to pass out every time he stands (or sits) up; blue lips, skin or nail beds; stiff or painful neck; purple or red rash/ blotches that stay when pressed by a glass; muffled voice or inability to open jaw; pain, pressure or tightness in the chest, jaw or arm or making an effort to breathe, even whilst inactive or resting.

Symptom Assessments:

Cold symptoms (incomplete)

Call Center RN Support Tool

Telephone Consult for William Bland, a 18 year old man ?

Call Symptom Assessment Medical Information Referrals Emergency Call-backs

Cold symptoms Restart

Conclusion: Your cold symptoms should improve with home treatment.

Reasons

Possible viral upper respiratory tract infection [more](#)
[show care points](#)

Recommendation

Does the nurse agree with the system conclusion? Yes No

Does the caller agree with the nurse's recommendation? Yes No

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Information icon text

Please select an information point.

Call note: (please type notes below)

Triage nurse call: William Bland is a 18 year old man with cold symptoms

Multiple "cold" symptoms .
Duration of cold symptoms less than 48 hours .

Pertinent negatives:

No: New confusion or inability to stay alert and awake; Feeling like you are going to pass out EVERY time you stand (or sit) up; blue or dusky lips, skin or nail beds; Newly stiff or painful neck ; purple or red rash/blotches that stay when pressed by a glass; muffled voice or inability to open mouth fully; pain, pressure or tightness in the chest, jaw or arm or struggling to breathe, even while inactive or resting .

No: fever present (> or = 100.4 F or 38 C) or suspected fever; blocked or runny nose; sore throat; sneezing; watery, red eyes; bloodshot eye(s) with yellow or greenish drainage or that are matted shut; very itchy eyes, nose or throat; Ear pain; cough; headache; pain or pressure in cheeks or forehead over sinuses, or in the upper jaw; severe widespread muscle aches or extreme fatigue or exhaustion .

No: new breathing difficulty such as wheezing or shortness of breath .

No: decreased fluid intake .

No: weakened immune system .

No: diabetes .

Symptom Assessments:

Cold symptoms (incomplete)

How Well Do They Work?

- n Callers view the experience as an improvement over “calling the doctor’s office;”
- n Outcome studies show more efficient use of resources without increased adverse outcomes;
- n Low rates of inter and intra-provider process variation reduce liability risks;
- n Introducing changes in underlying medical logic can be rapidly accomplished ... and requires minimal group-wide training;
- n Automated record-keeping makes the entire process “auditable” facilitating iterative TQM interventions;
- n Non-English speaking callers can easily be directed to appropriate bi-lingual RN or RN assisted by appropriate translation services;

Problems

- n High unit cost to operate a call center that provides “ring-to-answer” times acceptable to worried/concerned patients (30-45 seconds);
- n Require effective “marketing” to be routinely utilized;
- n Despite the lack of outcome data supporting the decision, using non-RNs is not yet an acceptable “business risk.”

Web-Based Symptom Triage

- n Essentially “remove the Call Center RNs from the loop”
 - the underlying software prompts the user to sequentially provide the information required to identify the most appropriate “next step.”
- n In routine use by third-party beneficiaries in the EU;
 - just being introduced by some third party payers in US.

How Well Does Web Triage Work?

- n Outcomes little-studied to date;
- n Huge cost advantages over telephone call centers ... 100+ to 1;
- n Don't require trained work force in central workplace.

- n Note: Because the underlying medical decision trees tend to be "more conservative," web triage will likely be shown to result in:
 - n Equivalent medical safety;
 - n Slightly higher median level of resource utilization ... but that increased cost will be than off-set by the huge operational cost advantages.

Telephone-Web Hybrids

- n Individual user interacting with a web-based application is, under pre-defined circumstances, automatically connected to a call center operator;
- n Simultaneously captures the cost per encounter advantages of web encounters and the resource-use per encounter advantages of "live" encounters.

How well do hybrids work?

- n No US data from medical utilization of this model;
- n Operationally, this model works well (and at scale) for multiple commercial corporations ... especially those providing technical support services at great scale.

As a Hypothetical ...

- n Decision today made to develop and pre-position a web/telephony-based tool supporting protocol intended to:
 - n Identify individuals with signs/symptoms that do not meet criteria for anti-viral intervention;
 - n Direct them to the most appropriate Self Care /Self Monitoring strategies;"
 - n Direct others to appropriate location in their area for further evaluation;
 - n Maintain longitudinal encounter records with appropriate privacy protection;

- ... and with the underlying protocol being easily updateable in real-time.

Practical Considerations

- n Will work only if the system is created in advance of need, moth-balled, subject to turn-key implementation, and routinely updated to reflect most current expertise/policy decisions.
- n Such a “system” has two components:
 - Technical knowledge: “How” to implement the expert knowledge uniformly and at scale.
 - Expert knowledge: “What” to do.

Technical Knowledge; Not Rate-Limiting

n Technical knowledge experts could, within a couple of weeks, quite easily create and contract for the mothballing of stand-by systems ready to respond to millions of inquiries per day.

Implementing Technical Knowledge

- n Contract/intra-agency agreements for;
 - Web site construction;
 - Standby call center services (off-shore?);
 - Deploying hybrid web-telephony systems;
 - Software tools to “capture” expert knowledge, render it to web users and/or call center operators, provide longitudinal individual and aggregate records, and allow its routine updating.

Expert Knowledge; Rate-Limiting Step:

- n Generally experts in any field:
 - Self-identify as “artist;”
 - Have limited experience in rendering their art in a manner that allows non-experts to rapidly mass produce it.

Expert Knowledge; Rate-Limiting Step:

- n Most medical subject medical experts:
 - Are acutely aware of the ~5% of cases that exist “outside +/- 2SD;” (often, that very awareness actually defines their expertise);
 - Have little experience operating in (and, therefore, planning for) severely resource-constrained environments;
 - Do not routinely practice “playing well” with non-experts.

Expert Knowledge;

Rate-Limiting Step:

- n Today, what would be the best/least bad decision strategy that could be presented through a medically untrained call center operator and/or a lay-user directed web site to:
 - Identify individuals with signs/symptoms but that do not meet criteria for anti-viral intervention;
 - Direct them to the most appropriate Self Care /Self Monitoring strategies?

Preparing the Audience

- n Americans have no collective experience with resource-rationing;
- n Acceptance will require “pre-deployment marketing” the plan to those who will be directly effected:
 - Non-expert medical personnel;
 - Non-medical leaders;
 - General population

Summary

- n During a flu pandemic, telephone call centers and web-based tools could allow rapid, large scale deployment of standardized protocols to best/least poorly distribute constrained resources;
 - Technically ,relatively easy;
 - Medically, potentially quite difficult;
 - Marketing is a key element of success/failure