

Brightening Scientific Publications with Crossword Puzzles

Laurie Lewis

I confess. I am an addict.

My addiction? Crossword puzzles. Every day I solve at least three or four crosswords. I do a puzzle with my final sips of morning coffee before beginning the workday. I have a quickie when I need a respite from the computer. Before retiring for the night I do another to wind down. I find crosswords to be a better stimulant than coffee and a better relaxant than alcohol. And they have no calories.

About 6 years ago, a fellow freelance medical writer who knows my passion for crosswords told me that one of his clients included a puzzle in a bimonthly magazine and had just lost the crossword-maker. Could I create puzzles, he wondered, as well as solve them?

I had never tried to create a crossword puzzle, and I doubted that I could. But before I knew what was happening, I let the magazine editor talk me into taking a stab. I had 2 months to come up with my first submission.

For weeks I tried, unsuccessfully. I could make it halfway through, and then I got stuck. I was about to call the editor to tell her to look for another puzzle-creator when suddenly something clicked.

That was the start of a 2-year stint in making puzzles for a pharmacy magazine. Later, I created crosswords for a magazine for people with asthma and for a long-term-care publication for which I also write.

The Creative Process

Creating crossword puzzles is a totally different process from editing or writing. It is not a linear process in which one word flows into

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the next. It is more akin to conducting a scientific experiment, with solution of a series of problems the goal. One problem may be to create a symmetric grid with three 13-letter words. Or to find a six-letter word the second letter of which is *h*, the fifth a consonant, and the last *a*. Or to come up with a definition for *men* that will make the solver think.

As in all scientific endeavors, the right instruments are essential. I always thought that crossword-puzzle dictionaries were an insult to the solver's skill, but I would be lost as a puzzle-creator without the six crossword dictionaries on my shelves. Periodically, I browse the reference section of bookstores looking for books that will help me create puzzles. My greatest find lists well-known people by both first and last names. If I need an eight-letter word starting *mac*, I can look in the last-name section and find Shirley MacLaine or Archibald MacLeish; turning to the first-name index, I land on Mac Davis.

Software is available to create crosswords, but most computer-generated puzzles are disappointing. The programs limit control of the number and theme of the words and the size of the grid. The software is not capable of human thinking; it won't come up with a two-word solution or a recognized abbreviation for a tight spot and may take the easy way out with an asymmetric grid or fill-in pattern. I use the software mainly to produce a camera-ready puzzle to send to my clients. Sometimes I save time by having the computer make the grid.

Constructing the Puzzle

Crossword-puzzle creation begins with construction of a grid. The grid is a square consisting of the same number of spaces across as down. The puzzle accompanying this article is a 15 X 15 grid, that is, 15 squares across and 15 down. The standard crossword-puzzle grid has diagonal symmetry; the pattern beginning in the upper left corner is mirrored starting in the lower right corner. The shortest allowable word is three letters.

Although the rules are few, the creation

of the grid can be tricky. For the puzzle in this article, I wanted the center line to be a 13-letter word. It took a while before I came up with a symmetric grid without any two-letter words.

The customized puzzles I design have a theme. I make a list of words related to the theme, and then I begin to plug them into the grid. Must-have entries like the 13-letter one in the center line go in first, in pen so that they are not inadvertently erased in the trial-and-error process that follows. Other theme words are penciled in where they appear, at least initially, to fit. Words with relatively rare letters are placed carefully; *j* may be a first letter but not a second, whereas *y* is good as a last letter. Common letters like *s*, *t*, *r*, and *e* are tentatively positioned in tight places, but even they may not work in the long run.

After I have about six or eight theme words in position, I start to fill in the grid with more words. I usually begin in an area that appears to be difficult, such as a five-letter space with *z* as the fourth letter, or that has the fewest options. After completing one section of interconnecting words, I move on to the next difficult area.

Filling in the words is the hardest part of puzzle creation. Every letter of each word must connect with another word, and each of those words must connect with others. After struggling with a section for an hour or more, I may sigh in relief that I found a solution, only to see that I've created a non-word, like *stip* or *wasna*.

The final stage in puzzle construction is creation of the clues. The clues are the only part of the puzzle that most solvers will notice. Whether the solver enjoys the puzzle depends on how hard or easy, how mundane or clever, the clues are.

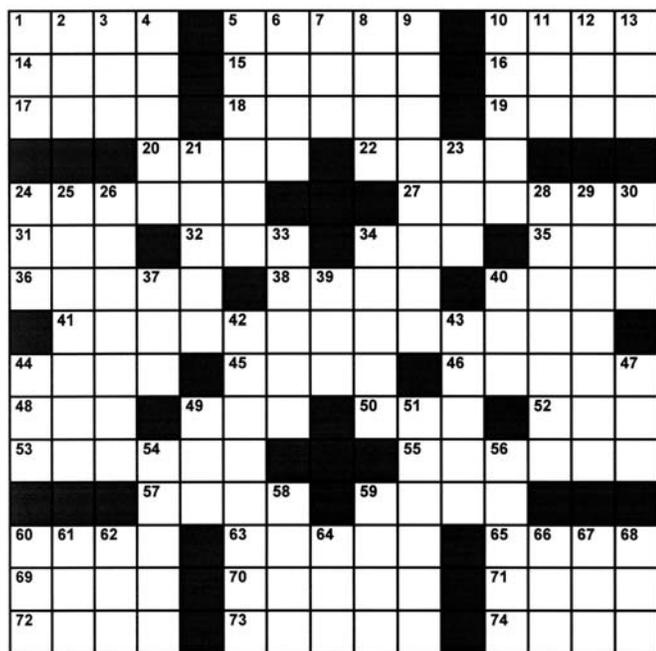
Science Puzzles

In some ways creating puzzles for a targeted audience is easier than creating general puzzles. Words and abbreviations known to the target group often work when no other word will. A book of medical abbreviations

Brightening Scientific Publications *continued*

Calling All Science Editors!

Solution on page 90.



ACROSS

- 1 Sci. branch
- 5 Marie Curie, for one
- 10 Average
- 14 Retail transaction
- 15 Before violet or sound
- 16 Bad guy
- 17 What members of 1 Down do
- 18 Points
- 19 Cupola
- 20 Mighty small unit
- 22 Look ___ ___!
- 24 Newton's gravity testers, so legend goes
- 27 Spelling of New York senator that editors will change
- 31 Statistic's square test
- 32 It's measured in MB
- 34 Recently ended 20th (abbrev.)
- 35 Healing sci.
- 36 Exactly agrees
- 38 ___ breve
- 40 Quantities, in short
- 41 Must-read for members of 1 Down
- 44 Ceases to be
- 45 French egg

- 46 Foci of the biotech industry
- 48 Cash register co.
- 49 Finis
- 50 Certain contact info
- 52 After editor or spec
- 53 Scientific tests
- 55 Contribute
- 57 Ruminant
- 59 Float
- 60 =, for a double
- 63 Sign that might be seen in Northern Ireland
- 65 Places
- 69 Garfield character
- 70 Sound navigation ranging
- 71 Spread for people watching their saturated fat
- 72 Not quite reach statistical significance
- 73 Synonym for 17 Across
- 74 Atomic number 10

DOWN

- 1 Your org.
- 2 Owned
- 3 Ivy Leaguer
- 4 Electron-losing conductor

- 5 Internal lining of the body
- 6 Potassium aluminum sulfate
- 7 Sights on a detox unit
- 8 Italian or Spanish stringed instrument
- 9 Where names of some members of 1 Down may be found
- 10 These days, it may be made by computer
- 11 Freudian subject
- 12 Branch
- 13 Maiden name indicator
- 21 Without a lot of extraneous verbiage
- 23 Pt. of an hr.
- 24 Ca or chem org.
- 25 Astro or nuclear
- 26 Grasping tool
- 28 Compound of nitrogen and hydrogen
- 29 Back off
- 30 Nonmetric units (abbrev.)
- 33 Sprayed the mob
- 34 Fissure
- 37 Chemical prefix
- 39 Romanian currency
- 40 Ingested
- 42 Not scientific, perhaps
- 43 Domed home
- 44 Double helix
- 47 Lupus, initially
- 49 Sense organ
- 51 Shevardnadze
- 54 Included
- 56 Synthetic fiber
- 58 Realtor's unit
- 59 Fiber-rich cereal
- 60 Branch sci.
- 61 Poem
- 62 Diarist
- 64 Chemical suffix
- 66 Toreador's shout
- 67 Corp. bigwig
- 68 It may be positive or negative

and another with drug names have given me the solution on many occasions when I was creating puzzles for my clients.

Sometimes creative clues are the answer. I once needed a seven-letter word that started with *h* and ended with *a*. I was about to throw in the towel after hours of unsuccessful attempts to make all the connections work. Suddenly I had a brainstorm. The letters that fit were *hebarca*. The clue: "Helium, boron, argon, calcium." I could never have used that clue for a nonscientific audience.

As I consider options, I pick words that have particular meaning for the audience. Doing a puzzle for a publication read by physicians, I might choose the word *hand* even though *land* or *Hans* would work just as well. The clue for hand could be "Carpus, metacarpus, and phalanges."

Not all words or clues can be on the chosen theme or directed to the target audience. Sports figures and television stars, foreign currency and rivers in faraway lands, slang expressions and snippets from well-known poems, and just ordinary words complete the puzzle. These terms not only challenge the puzzle-solver to draw on knowledge outside his or her chosen field; they also test the brainpower of the creator. I know next to nothing about sports, yet I amazed myself by coming up with "Bonilla, for one" as a clue for *Bobby* and "Brave opponent in 1999 NL playoffs" as a clue for *Met*. (Thank goodness for the Internet! It's great for verifying information like this.)

Editors of scientific publications that have printed my puzzles appreciate the light touch that crosswords add to the content-heavy pages of their issues. These editors view puzzles as ways to engage their readers and create an interactive environment—on paper instead of the Web. These clients are willing to pay the fees that the time-consuming process of crossword creation merits. My fees are based on the size of the grid and generally are similar to rates paid freelance writers for articles in the same publication.



Calling All Science Editors!

C	H	E	M		M	A	D	A	M		M	E	A	N
S	A	L	E		U	L	T	R	A		O	G	R	E
E	D	I	T		C	U	S	P	S		D	O	M	E
			A	T	O	M		A	T	M	E			
A	P	P	L	E	S				H	I	L	A	R	Y
C	H	I		R	A	M		C	E	N		M	E	D
S	Y	N	C	S		A	L	L	A		A	M	T	S
	S	C	I	E	N	C	E	E	D	I	T	O	R	
D	I	E	S		O	E	U	F		G	E	N	E	S
N	C	R		E	N	D		T	E	L		I	A	L
A	S	S	A	Y	S				D	O	N	A	T	E
			D	E	E	R		B	U	O	Y			
B	O	N	D		N	O	I	R	A		L	O	C	I
O	D	I	E		S	O	N	A	R		O	L	E	O
T	E	N	D		E	M	E	N	D		N	E	O	N

Solution to puzzle on page 83.